Issues in Surveys of Sexual Behavior: Problems with the Samples, the Questions, the Answers, and Whether Frisky Really Means Risky

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CAPS Methods Core Presentation

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Physiological Measures of Arousal

- Physically invasive instrumentation

- Unable to differentiate low risk and high risk sexual activities (or one sex partner from another)

- Correlate imperfectly with self-reports, especially among women (Chivers et al., 2010, Archives of Sexual Behavior, v39, p. 5-56)

Observation of Sexual Behavior

- Can differentiate low risk and high risk sexual activities (but not always)

- Culturally proscribed

- Likely to affect the behavior being observed (this is also true of diary-keeping or using mobile apps to report sexual behavior)

Biological Markers of Unprotected Sex

- Typically include incidence of HIV and/or other STIs (and pregnancy for heterosexual women)
- Low incidence (except for STIs in adolescents and young adults)
- Costs associated with materials, lab processing, and time and personnel commitments may be prohibitive
- For any given individual, relationship to risk behavior engaged in imperfect at best (see Boily et al., 2009, The Lancet Infectious Diseases, v9, p. 118-129)

New York Times Op-Ed Piece

ARE you confused by sex? I certainly am.

One of the many reasons sex is puzzling is that we lack reliable data.

People lie to friends, lovers, doctors, surveys and themselves.

I analyzed data from the General Social Survey, a classic source.

Who is telling the truth, men or women?

Neither.

Respondents are NOT intentionially misleading us.

- Why do survey research if you don't believe the answers you get?

- It is difficult to give consistent answers across a sexual behavior assessment using false numbers

- Not the likeliest scenario given other sources of error (poor questions, difficult answers, etc.)

Table 7. Mean number of adult lifetime sex partners, 1989
       (Heterosexuals only)

	Males	Females
Unadjusted	13.00	3.24
Adjusted for non-response*	12.05	3.03
And adjusted for extreme values**	9.36	3.02

* = Values of 1.0 given to males and females with missing data
* * = Values of 50 and greater recoded to 50

Males: Females

4.06: 1

3.98: 1

3.10: 1

[All male/female means different at 0.0001 level]

(Smith , 1992, Journal of Official Statistics, v8, p. 309-325)

Table 8. Mean frequency of sexual intercourse during last year (1989)

	Males	Females	Prob.
All adults*	67.2	50.4	<.001
Married adults	70.5	64.6	.203
Married adults, one partner	71.5	71.7	.976

• Note that these numbers are very similar to those reported by Stephens-Davidowitz in his op-ed piece

(Smith , 1992, Journal of Official Statistics, v8, p. 309-325)

Smith's Conclusions

- Within a closed population there should not be any gender differences
- Gender differences are concentrated among the unmarried
- Result from intentional overreporting by males and intentional underreporting by females
- Consistent with gender differences in social values

Analysis by Morris

- Men are typically older than their female partners?

- >60% of lifetime partners would have to be <18 years old

- Excluded commercial sex workers?

- Even if half of men reported CSW contacts, they would have to average 15 different CSW partners

Analysis by Morris

- Sex during travel not reported?
- Unlikely to comprise 60% of lifetime partners (or anything close to that)
- Reporting bias?
- One would have to assume all men over-reporting by 65% and all women simultaneously underreporting by 200%

Analysis by Morris

- Bias is in the upper tail of the distributions
- Analyzed data on number of partners from 1989, 1990, and 1991
- For partners since age 18, male:female ratios were 3.01-3.43
- When restricted to men and women who report <20 partners (89% of the sample), the ratios drop to 1.07-1.33

Analysis by Morris

- For partners in the past year, male:female ratios were 1.50-2.22

- When restricted to men and women who report <5 partners (97% of the sample), the ratios drop to 1.01-1.22

- >75% of the upper tail respondents report lifetime partner totals in round numbers (25, 30, 35, 40, etc.)

- Suggests shorter time frames will reduce error

% of cases >12 with 0/5 values

	Zero	<12	>12 and 0/5 values
UMHS (1997) # male partners past year (N=2836)	14%	83%	93%
LMOE (2001-2002) # male anal sex partners past 3 months (N=847)	26%	91%	87%
BLACK MP (2009-2013) # male sex partners past 2 months (N=3006)	59%	99%	69%

What can we conclude so far?

- There is no indication respondents are not telling the truth, and this is not the likeliest scenario given other potential sources of error
- There may be some self-presentation bias in the form of giving what are perceived to be socially desirable responses
- Numerical responses are probably inaccurate, and at the upper end of the distribution are clearly estimates or calculations
- At best we can say that people who answer with higher numbers are having more sex than people answering with lower numbers

Ways to Reduce Self-presentation Bias in Particular and Response Error in General

- Anonymity
- Confidentiality
- Privacy
- Removing the influence of the interviewer through the use of computerized self-administered surveys (CASI)
- Clearly defining key terms in survey questions

Definition Exemplar #1

By anal sex I include both any time you put your penis in a man's anus (what I will call **insertive anal sex**) or a man put his penis in your anus (what I will call **receptive anal sex**). It counts as anal sex even if no one had an orgasm (or "cums") as a result of the anal sex. It counts no matter how long someone's penis was in someone's anus, even if just for a moment.

Definition Exemplar #2

Sometimes men wear a condom when they have anal sex and other times they do not. By <u>wearing a condom</u> during anal sex I mean…

That during <u>insertive</u> anal sex <u>you</u> wear a condom <u>ALL</u> the time <u>your</u> penis is inside the other man's anus; or…

That during <u>receptive</u> anal sex the <u>other man</u> wears a condom <u>ALL</u> the time his penis is inside your anus.

Enhanced Introductions to Questions

- Justification for asking sensitive questions

People have many different ways of making sure that their health care needs can be paid for. In general, people with larger incomes can more easily get medical care. Tell me when I get to the category that best describes your <u>personal</u> income from all sources before taxes for all of <u>2001</u>.

Enhanced Introductions to Questions

- No "right" answer
- Wide range of possible answers (permission giving)

Some men choose to tell their family and friends that they are sexually attracted to men. Other men choose not to. How many of your **family members** have you personally told that you are sexually attracted to men?

Ask Better Questions

- Ask questions in a concise and straightforward manor to reduce respondent interpretation
- Embed the definition in the question rather than using terminology
- Insure important elements of the question are highlighted for the respondent

In the past two months (60 days), how many times did you put your penis in a man's rectum (butt) <u>without</u> using a condom?

Methods Study to Compare Standardized Interviewing to Conversational Interviewing

- Sought MSM with high levels of sexual activity
- Primarily recruited at bathhouses & sex clubs
- Adult MSM who reported anal sex with a man in the prior 3 months qualified
- Screened for sex venue use: men who reported having sex at a bathhouse/sex club AND either used the Internet to "hook up" with another man for sex or had sex in a cruising area were deemed "high risk" (63% of the sample were high risk)

They were frisky in the prior 3 months… (N=204)

	Prevalence	Mean	Median
Age		44.3	45
HIV-positive	36.3%		
STI dx (past year)	22.1%		
Insertive partners	82.4%	5.82	2.50
Insertive UAI prt.	54.9%	3.09	1.00
Receptive partners	77.0%	4.57	2.00
Receptive UAI prt.	48.3%	2.04	0

But not as risky as we thought

	Last 3 Months	Last Partner
No anal sex	2 (1.0%)	68 (33.3%)
Safe anal only	62 (30.4%)	62 (30.4%)
Unsafe, strategic	44 (21.6%)	64 (31.4%)
Unsafe, withdrawal	45 (22.1%)	10 (4.9%)
Unsafe, ejaculation	51 (25.0%)	0

GSS Sexual Behavior Assessment

There is a great deal of concern today about the AIDS epidemic and how to deal with it. Because of the grave nature of this problem, we are going to ask you some personal questions and we need your frank and honest responses. Your answers are confidential and will be used only for statistical reports.

GSS: Number of partners in past year

How many sex partners have you had in the last 12 months?

1 partner
2 partners
3 partners
4 partners
5-10 partners
11-20 partners
21-100 partners
More than 100 partners

GSS: Gender of partners in past year

Have your sex partners in the last 12
months been exclusively male, both male
and female, or exclusively female?

GSS: Frequency of sex in past year

About how often did you have sex during the past 12 months?

Not at all
Once or twice
About once a month
Two or three times a month
About once a week
Two or three times a week
Four or more times a week

GSS: Number of partners since age 18

Now thinking about the time since your 18th birthday, (again, including the recent past that you have already told us about) how many female partners have you ever had sex with?

Again, thinking about the time since your 18th birthday, (including the recent past that you have already told us about) how many male partners have you ever had sex with?

GSS: The lone condom use question

The last time you had sex, was a condom used? By "sex" we mean vaginal, oral or anal sex.

Yes, the last time I had sex a condom was used

No, the last time I had sex a condom was not used

GSS Summary

- Anonymous, Confidential, CASI, justify sex questions

- Justification based on AIDS may create bias

- No definition of "sex"

- 12-month numbers are pre-categorized estimates that do not differentiate male from female partners if bisexual

- Condom question only asks about last time had sex <u>and</u> includes oral sex

Issues for Respondents

- Naïve respondents don't know they were supposed to be counting their sexual exploits
- The definition of, and terminology for, "sex" is highly variable across respondents
- It is not always easy to map ones responses onto the response set provided (i.e., people's sex lives can be messy)
- The frequency of sex question is especially difficult to answer if one's sex life does not have the regularity implied by the question

National Health Interview Survey (NHIS)

- Annual survey of a national probability sample of households (N=35,000) conducted by the Census Bureau

- No sexual behavior questions

- Does ask self-defined orientation, ever been tested for HIV, and reasons for never testing

California Health Interview Survey (CHIS)

- Run by UCLA Center for Health Policy Research (Westat does data collection)
- Biannual survey of a statewide probability sample (N=50,000) of adults, teenagers, and children conducted in English, Spanish, Cantonese, Mandarin, Korean, Tagalog, and Vietnamese
- No introduction to sexual behavior questions
- Questions not asked if >70 years of age
- No definition of "sex"
- # partners past 12 months (numeric) and gender of partners (male/female/both)
- Self-defined orientation and HIV testing questions

National Health and Nutrition Examination Survey (NHANES)

- Conducted by the National Center for Health Statistics (NCHS)
- Runs in 2-year cycles interviewing a national probability sample with no age limits (N=5000 annually)
- No introduction, questions not asked if >70
- Initial question to men is, "Have you ever had any kind of sex with a woman?", defined as "vaginal, oral, or anal sex", but those terms are not defined for the respondent
- Succeeding "ever had" questions give reasonable definitions for vaginal sex ("your penis in a woman's vagina") and performing oral sex on a woman ("putting your mouth on a woman's vagina or genitals") but not for anal sex with a woman ("contact between your penis and a woman's anus or butt")

NHANES Continued

- Then asks if ever had any kind of sex with a man, including oral or anal (<u>no definitions</u>)
- # women had sex with, had vaginal sex with, and performed oral sex on; lifetime and past 12 months (numeric)
- # men had anal or oral sex with, and anal sex with; lifetime and past 12 months (numeric)
- At this point asks if ever performed oral sex on a man, defined as "your mouth on a man's penis or genitals"

NHANES Continued

- # men performed oral sex on, lifetime and past 12 months (numeric)
- Questions about receiving oral sex not asked
- Past 12 months, # times had vaginal/anal sex (categorical) – <u>not</u> asked separately for male and female partners
- Past 12 months, how often had vaginal/anal sex without using a condom (never/less than half of the time/about half of the time/not always, but more than half of the time/always)
- Asks about STIs and self-defined orientation

National Survey of Family Growth (NSFG)

- Also run by NCHS, runs in 1-5 year cycles (currently in a 5-year cycle) interviewing national probabuility samples on men and women age 15-44 (N=5000 annually)
- Separate sections for women having sex with men, men having sex with women, and men having sex with men (parallel questions)
- No introduction
- Initial set of "ever" questions clearly define performing and receiving oral sex, insertive and receptive anal sex

NSFG Continued

- Each "ever" question followed by asking whether respondent used a condom the last time they engaged in that behavior
- # male sex partners ("oral or anal sex"), lifetime and last 12 months (numeric)
- Last 12 months, # men had oral sex, receptive anal sex (defined), and insertive anal sex (defined) (numeric)
- Last time had oral or anal sex with a male, was a condom used
- Characteristics of last partner, forced sex, risky partners, serosorting, sexual attraction and self-defined orientation

National Surveys as Sources of Data on Sexual Behavior

- GSS, NHIS, CHIS – do not use

- NHANES – sex with opposite-gender partners (condom use only if bisexuals deleted)

- NSFG – sex with opposite-gender and same-gender partners (but NOT condom use)

Considerations in Evaluating Validity of Survey Data on Sexual Behavior (or in designing Your Own Survey)

- Can you identify the target population?
- Does the sampling approach yield a representative sample of sufficient size from the target population? (Internet samples – work well for voting behavior and consumer behavior)
- What are the data goals? (prevalence, numeric point estimates, policy recommendations)
- Is the data collection method likely to have preserved anonymity and confidentiality and provided privacy?
- Is the presence/absence of an interviewer appropriate to the questions being asked?

Considerations Continued

- Does the survey instrument answer the research question(s) and meet the data goal(s)?

- Are sexual terms defined for respondents in a credible way?

- Are the definitions "inclusive" or "exclusive", and are they appropriate given the research question(s)?

- Is the "recall window" used for the survey reasonable and appropriate to the research question(s) and data goal(s)? (coverage vs. accuracy)

Considerations Continued

- Does each question clearly specify who, what, when, and how? (and, occasionally, where)
- Do the data look generally reasonable? (response range, amount of variance, amount of missing data)
- Do the interpretations of the data match with the questions asked in the survey instrument?
- Do the interpretations of the data match with the sample surveyed?
- Do the interpretations of the data match with the data presented in text and tables?

Big Data
(www.aapor.org => education & resources => reports)

- There's a lot of it, is often reported with high frequency, and comes in no standard format

- Can include social media data, personal data (e.g., from tracking devices), sensor data, transactional data, and administrative data (which tends to be more structured, "known")

- Big data often has a fungible quality (algorithms that create the data change often)

Big Data is Secondary Analysis

- Data being analyzed in a way that is secondary to the original intent for collecting it ("found data" rather than "made data"; also called "data exhaust")

- Ethical issues both about the privacy of the people the data were collected about and using data that a company may already have a proprietary interest in

Big Data should be used as a compliment to, not instead of survey data

- Data issue – variables may not actually represent what you think they do

- Data issue - amount of missing data may be more than you think

- Sampling issue – miss some people you should have in the population, include some people who are not part of the population, people appear in the data set multiple times

The same fundamental questions apply when analyzing "big data"

- In survey research, a high response rate does not always equate with high quality data, and a low response rate does not always equate with low quality data. Similarly, having a lot of data does not mean you have a lot of useful information.

- In the example of analyzing Google search data, first and foremost, it begins with a qualitative study of themes (which is not described)

Stephens-Davidowitz "big data" questions

- Can we identify the target population?
- Presumably Google English-<u>readers</u> worldwide, and we don't know the length of time across which data were aggregated
- Is the sample representative of the target population?
- We have no information on characteristics of Google users, no indication that users who made multiple searches are adjusted for (and author cites source suggesting an oversample for people with sex on their mind)