Cognitive Strategies Affecting Recall of Sexual Behavior Among High-Risk Men and Women

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Objective: Most sexual health research depends on self-reported information, but little is known about the ways in which individuals arrive at their responses to sexual behavior questions. The purpose of the present research was to investigate the cognitive strategies and contextual cues used to recall sexual behaviors among men and women at high risk for HIV. *Design:* 102 men and 106 women were recruited from a public health sexually transmitted disease clinic (mean age = 31 years; 45% African American, 50% White) and asked to think aloud as they responded to questions about number of lifetime sexual partners and frequency of vaginal and oral sex (in the past 2 weeks or 3 months). *Main Outcome Measures:* Transcripts of participant interviews were coded for the different types of cognitive strategies and contextual cues that were used to recall counts of sexual partners and behaviors. *Results:* Multivariate logistic regressions indicated that respondents tended to enumerate each instance of behavior when recalling low frequencies of behavior and small numbers of partners and to use rate-based estimates or general impression strategies when recalling high frequencies and numbers. Most respondents did not use self-generated contextual cues. *Conclusion:* Results suggest that reports of high frequencies of sexual behavior or large numbers of partners are approximations. For valid and reliable assessment, researchers should direct respondents to recall sexual behavior in small, manageable chunks through the use of interviewer prompts.

Keywords: sexual behavior, cognitive strategies, recall, memory

A host of factors can influence the reliable and accurate self-reporting of sexual risk behavior. Social desirability, question and response interpretation, and problems in the ability to recall sexual behaviors have all been associated with reporting bias (Acree, Ekstrand, Coates, & Stall, 1999; Brody, 1995; Cecil, Pinkerton, Bogart, Pavlovic, & Kimball, 2005; DiFranceisco, McAuliffe, &

Sikkema, 1998; Tourangeau & Smith, 1996; Turner, Ku, Rogers, Lindberg, & Pleck, 1998; for reviews, see Catania, Gibson, Chitwood, & Coates, 1990; Catania, Gibson, Marin, Coates, & Greenblatt, 1990; Schroder, Carey, & Vanable, 2003; Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). In particular, the types of cognitive strategies used to estimate behavioral frequencies may contribute to the accuracy of self-reports (Blair & Burton, 1987; Burton & Blair, 1991; Conrad, Brown, & Cashman, 1998; Menon, 1993). Cognitive strategies for the recall of frequency information, such as numbers of partners or frequencies of behaviors, tend to fall into one of two categories: (a) enumeration, in which each event is recalled and counted separately (Brown, 1997; Burton & Blair, 1991); and (b) estimation, which may be based on the perceived rate at which the behavior occurs (Conrad et al., 1998; Menon, 1993), on a tally of previously retrieved and counted events (Brown & Sinclair, 1999), or on a general impression and/or rounding strategy (i.e., to convert a qualitative impression such as "a lot" into a numerical estimate, Brown, 1995; Brown & Sinclair, 1999; Tourangeau & Smith, 1996).

Individuals recalling small numbers of events or behaviors from more recent time frames, particularly irregular behaviors from different contexts, generally use enumeration (Brown, 1997;

Burton & Blair, 1991). Prior research has suggested that reports based on enumeration may be subject to underestimation. Specifically, when individuals enumerate the number of events that happened in a specific time frame, they may forget to include some events; they may count similar events together; or they may incorrectly think that more vivid events, which are brought to mind more easily, are more frequent than less vivid events (Bradburn, Rips, & Shevell, 1987; Brewer, Garrett, & Kulasingam, 1999; Burke & Srull, 1988; Tversky & Kahneman, 1973).

Individuals recalling a high frequency of regular, similar events tend to estimate using rates. Burton and Blair (1991) posited that respondents who use a general rule about their sexual behavior to estimate frequencies may not take into account exceptions to the rule, potentially leading to inaccurate frequency reports. Basic cognitive psychology research (Brown, 1995) suggests that general impressions are inherently imprecise because they are used by individuals who have engaged in behaviors that are too numerous to store as separate events in memory.

In addition to the contribution of cognitive strategies to recall accuracy, the use of contextual retrieval cues may also be associated with more valid self-reports, especially for irregular behaviors (Menon & Yorkston, 2000). Reconstructive theories of memory posit that memories for specific autobiographical events are stored along with contextual information about the environment (Friedman, 1993). When individuals are asked to recall an event, they access this contextual information in conjunction with the actual event. This implies that more vividly recalled events are recalled more accurately, as are events for which more information is remembered. Moreover, although exact dates tend to be poorly remembered, individuals tend to recall events accurately that are tied to temporally meaningful information (e.g., birthdays, news events; Brown, 1990; Friedman, 1993; Loftus & Marburger, 1983).

We identified only three studies that had investigated the use of cognitive strategies to recall sexual behavior, none of which had comprehensively examined cognitive strategies in a sample at risk for HIV. Brown and Sinclair (1999) found that college students with fewer lifetime sexual partners were more likely to use enumeration strategies and less likely to use general impression than were students with larger numbers of partners; women were more likely to enumerate or use a tally and less likely to use general impression than were men. In a small study with 37 undergraduates, Garry and colleagues (Garry, Sharman, Feldman, Marlatt, & Loftus, 2002) compared 1-month coital diary entries with recall estimates taken from 6 to 12 months later for same time period. Participants were asked to indicate the recall strategy they used from a list of options (i.e., guess, rate, do not know, and do not remember); the list did not include enumeration. Gender, type of strategy, and retention interval were not related to report accuracy. Edwards, Thomsen, and Toroitich-Ruto (2005) used a think-aloud protocol to pretest a sexual behavior instrument with 15 female Kenyan sex workers. Qualitative analyses indicated that some respondents counted sexual partners and behaviors in backward chronological order, a method that may be more accurate than forward chronological order (Loftus & Fathi, 1985).

In the present study, we aimed to (a) define the types of cognitive strategies used by participants at risk for HIV to recall lifetime sexual partners and sexual behaviors for two different retrospective time periods (2 weeks and 3 months), (b) document the types of contextual cues that participants spontaneously used to retrieve sexual behavior information, and (c) examine the multivariate associations of cognitive strategies and contextual cue usage with sexual behavior counts (i.e., numbers of partners and frequencies of behaviors). On the basis of prior research (Brown, 1997; Brown & Sinclair, 1999; Burton and Blair, 1991), we hypothesized that respondents would use enumeration to recall smaller numbers of partners and frequencies of behavior. Because strategy selection may be related to recall bias, an accurate understanding of strategy use for sexual behavior would enable researchers to make realistic adjustments to epidemiological models of HIV that rely on self-report data and to inform the design of self-report instruments.

Method

Participants, Setting, and Procedure

A total of 102 men and 106 women being treated or tested for sexually transmitted diseases and/or being tested for HIV were recruited from a public health clinic in a moderate-sized midwestern city. Participants ranged in age from 18 to 65 years ($M = 30.61$, $SD = 9.51$). Patients were informed of the opportunity to participate by clinic staff. Interested and eligible participants were interviewed by study research assistants in a private room at the clinic following regularly scheduled appointments. Participants were paid $20 for the 25-min interview.

Interview Instrument

Sociodemographics and HIV risk characteristics.   Participants were asked their date of birth, race and/or ethnicity, level of education, employment status, annual household income, current level of sexual activity, primary sex partner status, STD history, and HIV test history. Participants were also asked to report their sexual orientation on a scale from 1 (*exclusively gay/homosexual*) to 9 (*exclusively straight/heterosexual*). Because some response categories had small numbers of respondents, education was dichotomized into high school or less versus some college or more; income into less than $20,000 versus $20,001 or more annually; race into White versus African American/other; and sexual orientation into heterosexual versus gay/bisexual (7–9 vs. 1–6 on the scale, respectively). Sociodemographic and HIV risk characteristics of the sample are shown in Table 1.

Think-aloud protocols of sexual behavior.   Sexual behavior was measured with questions that have been commonly used in HIV prevention research in studies of at-risk heterosexual women (e.g., Kalichman, Rompa, & Coley, 1996) and men (e.g., Kalichman, Rompa, & Coley, 1997). Half of the participants were asked about sexual behaviors in the past 2 weeks, and half were asked about the past 3 months; all participants were asked about numbers of partners in their lifetime. Sexual behaviors included vaginal, oral, and anal sex, as well as alcohol and/or drug use in conjunction with sex and engagement in sex work (i.e., trading sex for money and/or drugs or trading drugs and/or money for sex). For each sexual behavior, participants were asked the number of times they had engaged in the behavior in the time frame, the number of those times that they had used a condom, and the number of partners with whom they had engaged in the behavior. Participants were also asked the numbers of male and female partners that they had had in their lifetime. The focus

Table 1
Sociodemographic and HIV Risk Characteristics of Sample

Characteristic	%
Gender (N = 208)	
Men	49
Women	51
Race/ethnicity (N = 208)	
White	50
Black/African American	45
Native American, Asian, mixed race, other	5
Income (annual; N = 207)	
≤$20,000	51
$20,001–$40,000	30
>$40,000	19
Education (N = 208)	
Less than high school	14
High school diploma/GED	32
Some college, college/graduate degree	54
Employment (n = 207)	
Full time	45
Part time	21
Unemployed	21
Other (retired, student, not specified)	13
Sexual orientation (men, n = 102)	
Heterosexual	84
Gay/bisexual	16
Sexual orientation (women, n = 106)	
Heterosexual	93
Bisexual	7
Primary partner status (n = 206)	
Regular/primary partner	70
No regular/primary partner	30
Current sexual partner status (N = 208)	
Multiple sexual partners	28
One sexual partner	46
Not sexually active	26
Sex worker status (N = 208)	
Recent sex worker	4
Recent sex worker client	2
STD history (N = 208)	
Prior STD	58
No reported prior STD	42

Note. STD = sexually transmitted disease.

of this report was on vaginal and oral sex, condom use for vaginal sex, and opposite-sex lifetime sexual partners. Because of nonnormality, we dichotomized sexual behavior frequencies and numbers of partners (low vs. high); we also calculated the log of the number of sexual partners in order to examine gender differences on this variable.

To examine the cognitive strategies and contextual cues used to recall sexual behavior, we asked participants to verbalize what they were thinking ("think aloud") as they responded to each sexual behavior question. Think-aloud procedures have been used extensively to study a wide range of cognitive processes, including memory and arithmetic calculation (Ericsson & Polson, 1988; Ericsson & Simon, 1980, 1993; Staszewski, 1988), both of which are relevant to the assessment of sexual behavior.

Protocol Analysis, Reliability, and Consistency

Participants' think-aloud responses were audiotaped, transcribed, and analyzed with protocol analysis techniques. (Because of tape-recorder malfunction, 12 interviews were not recorded.)

Laura Bogart and two raters developed codes to capture cognitive strategies and contextual cues based on initial inspection for key themes in all of the transcripts, as well as the available literature on cognitive strategies and think-aloud methodology (Blair & Burton, 1987; Bradburn et al. 1987; Brown, 1995, 1997; Brown & Sinclair, 1999; Burton & Blair, 1991; Conrad et al., 1998; Ericsson & Simon, 1980, 1993; Means & Loftus, 1991; Menon, 1993, 1997; Midanik & Hines, 1991). Cognitive strategies were defined as the methods that participants used to generate their numerical responses. Cues were considered to be details or descriptions about the context of the sexual behaviors that seemed to trigger participants' recall.

Two raters coded all of the transcripts, and a third rater resolved all discrepancies. Four types of strategies were coded for nonzero responses to the sexual count questions: enumeration, general impression, rate, and tally. Enumeration was used when each instance was recalled separately; general impression, when participants guessed on the basis of a qualitative impression of a large number of instances; rate, when the periodicity of the behavior was used to calculate a frequency; and tally, when a previously stored frequency was accessed. Six categories of cues were coded: chronologically ordered series (e.g., by year, partner name, life phase), condom availability at the time of sex, event (e.g., divorce, vacation), location (e.g., bar, work), partner (e.g., main partner, casual partner), and pleasure and/or enjoyment of the behavior. Cohen's kappas (Cohen, 1960) for strategies were .78 for a subset of the men's transcripts (n = 14) and .85 for a subset of the women's transcripts (n = 20); percentage agreement on cues was 93% for the subset of men's transcripts and 87% for the subset of women's transcripts. Both of the two raters coded the remaining transcripts after assessment of interrater agreement.

Statistical Analysis

Descriptive statistics were computed for all study variables. Fisher's exact tests were used to test the bivariate relationships between cognitive strategies (enumeration, nonenumeration), and sexual behavior counts (low, high) and time frame (2 weeks, 3 months), as well as to examine bivariate differences in sexual behavior counts and cognitive strategies by dichotomized sociodemographic and risk variables.

To test our hypotheses regarding cognitive strategies, we conducted a multivariate logistic regression predicting counts of sexual behavior (i.e., numbers of opposite-sex lifetime sexual partners, frequencies of vaginal and oral sex, and frequencies of vaginal sex condom use) with cognitive strategies (enumeration, nonenumeration), cue usage (yes, no), and time frame (2 weeks, 3 months). In all multivariate analyses, we used as covariates the sociodemographic and risk variables, all of which have been related to sexual behavior and the epidemiology of HIV (e.g., Centers for Disease Control and Prevention, 2005; Laumann, Gagnon, Michael, & Michaels, 1994).

Results

Descriptive Statistics and Bivariate Tests of Differences in Sexual Behavior Counts and Cognitive Strategies

Table 2 presents the means, standard deviations, and medians of the sexual behavior variables overall and by cognitive strategy and

Table 2

Descriptive Statistics (Means, Standard Deviations, and Medians) of Sexual Behavior by Cognitive Strategy

Cognitive strategy	Partners in lifetime (n = 189)			Vaginal sex (n = 133)			Condom use (n = 60)			Oral sex (perform) (n = 101)			Oral sex (receive) (n = 115)		
	M	*SD*	*Mdn*	*M*	*SD*	*Mdn*	*M*	*SD*	*Mdn*	*M*	*SD*	*Mdn*	*M*	*SD*	*Mdn*
Enumeration															
2 weeks				2.51	1.72	2.00	1.33	0.59	1.00	1.60	0.77	1.00	1.87	1.04	2.00
3 months				4.62	4.05	3.00	4.00	4.64	2.00	2.78	2.54	2.00	1.13	3.65	2.00
Overall	7.01	3.97	6.00	3.29	2.97	2.00	2.80	3.68	2.00	2.23	2.00	2.00	2.44	2.64	2.00
Nonenumeration															
2 weeks				11.32	9.14	6.5	10.50	13.03	4.50	5.64	6.43	4.00	6.79	4.32	5.00
3 months				28.59	31.46	20.00	16.25	13.12	14.50	28.23	38.50	10.00	23.67	35.67	9.00
Overall	45.90	71.42	22.00	24.75	28.92	15.00	15.10	12.97	12.00	23.96	35.80	10.00	21.04	33.33	8.00
Overall (full sample)	31.75	59.95	14.00	13.46	22.65	5.00	6.90	9.86	2.00	10.19	23.97	2.00	9.72	22.72	3.00

Note. Sample sizes reflect number of respondents with usable transcript data who reported engaging in the behavior.

time frame. Fisher's exact tests indicated that enumeration was significantly associated with recall of lower numbers of sexual partners and lower frequencies of sexual behavior, all $ps < .001$. Enumeration was also related to recall of sex for more recent time frames. Specifically, participants were significantly ($ps < .01$) more likely to use enumeration for the recall of vaginal and oral sex (both performing and receiving) and marginally ($p < .10$) more likely to use enumeration for the recall of condom use in the past 2 weeks versus 3 months.

Fisher's exact tests also indicated that numbers of partners and frequencies of sexual behavior significantly varied by regular partner status and age but not by participant gender, race and/or ethnicity, income, or education. Participants with a regular partner reported a greater frequency of receiving oral sex and were less likely to use enumeration to recall receiving oral sex than did participants who did not have a regular partner, both $ps < .05$. Older participants reported a greater number of sexual partners and

were less likely to enumerate compared with younger participants, both $ps < .05$.

Opposite-Sex Sexual Partners in Lifetime

As shown in Table 3, enumeration (36%) and general impression (31%) were the most frequently used strategies to recall opposite-sex sexual partners in lifetime among those respondents who reported having opposite-sex partners and who had usable transcript data. In addition, 53% of respondents used cues for recall; chronology cues were the most common. Results of the multivariate analysis indicated that enumeration was associated with a lower likelihood of recall of high numbers of partners (Table 4); none of the other predictors in the model were significant. Secondary analyses to further explore cognitive strategy differences indicated that general impression (odds ratio = 63.39; 95% confidence interval = 18.07, 222.39; $p < .001$), tally (odds

Table 3

Percentages of Cognitive Strategies and Cues Used to Recall Sexual Partners and Behaviors

Variable	Partners in lifetime	Vaginal sex	Condom use	Oral sex (perform)	Oral sex (receive)
Cognitive strategy (%)					
Enumeration	36	53	67	63	61
Rate	3	31	23	27	27
General impression	31	11	7	7	11
Tally	19	2	2	0	1
Multiple strategies	12	4	2	10	0
n[a]	189	134	60	101	115
Cues (%)					
Chronology	87	14	0	11	18
Condom availability	0	0	13	0	0
Enjoyment	0	5	6	32	18
Event	9	54	25	21	14
Location	9	3	0	0	0
Partner	17	38	63	54	46
n[a]	100	63	16	28	28

Note. Percentages of strategies may not add up to 100% because of rounding; percentages of cues may be greater than 100% because participants could use more than one type of cue.
[a] Sample sizes for cognitive strategies reflect number of respondents with usable transcript data who reported engaging in the behavior. Sample sizes for cues reflect number of participants with usable transcript data who used cues to recall each behavior.

Table 4

Adjusted Odds Ratios (OR) and 95% Confidence Intervals (CI) for Multivariate Logistic Regressions Predicting Counts of Sexual Behaviors[a] With Cognitive Strategies

Variable	Opposite-sex partners (lifetime) n = 183		Vaginal sex n = 129		Condom use n = 56		Oral sex (perform) n = 98		Oral sex (receive) n = 111	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Enumeration use	0.03	0.01, 0.07[***]	0.01	0.00, 0.05[***]	0.00	0.00, 0.09[**]	0.05	0.01, 0.18[***]	0.05	0.02, 0.19[***]
Contextual cue use	2.19	0.95, 5.05[†]	0.49	0.14, 1.69	7.57	0.93, 61.36[†]	1.74	0.46, 6.53	2.59	0.82, 8.19
Time frame (3 months)			9.26	2.57, 33.31[**]	22.55	1.54, 330.64[*]	6.67	1.95, 22.83[**]	2.28	0.82, 6.35
Male gender	1.37	0.60, 3.12	0.35	0.10, 1.28	0.44	0.06, 3.17	0.53	0.16, 1.75	1.31	0.48, 3.61
Primary partner	1.03	0.43, 2.48	0.36	0.08, 1.59	2.19	0.17, 28.13	0.83	0.23, 2.93	1.06	0.33, 3.44
Age in years	1.04	1.00, 1.09[†]	0.88	0.81, 0.95[**]	0.89	0.75, 1.06	1.03	0.96, 1.11	0.99	0.94, 1.05
White race/ethnicity	0.69	0.29, 1.64	1.11	0.30, 4.13	1.06	0.12, 9.78	0.52	0.16, 1.69	0.41	0.13, 1.26
Income (≤$20,000)	0.88	0.37, 2.11	1.53	0.43, 5.43	0.74	0.10, 5.65	1.80	0.57, 5.67	1.43	0.50, 4.12
Education (≤HS)	0.54	0.24, 1.23	0.49	0.14, 1.74	0.78	0.12, 5.20	0.51	0.16, 1.64	0.55	0.20, 1.50

[a] Numbers of partners for opposite-sex partners in lifetime and frequency of behavior for vaginal and oral sex, and condom use. HS = high school.
[†] $p < .10$. [*] $p < .05$. [**] $p < .01$. [***] $p < .001$.

ratio = 14.74; 95% confidence interval = 4.32, 50.33; $p < .001$), and multiple strategies (odds ratio = 52.79; 95% confidence interval = 11.80, 236.14, $p < .001$) were all more likely to be used than was enumeration for recalling high numbers of partners.

Vaginal Intercourse

Of respondents who engaged in vaginal intercourse and who had usable transcript data ($n = 133$), 52% used enumeration for recall, and 47% used cues, with event cues most frequent (Table 3). Multivariate regression results indicated that respondents who used enumeration were less likely to report high frequencies of vaginal sex (Table 4). In addition, respondents who reported behavior for the past 3 months versus 2 weeks and respondents who were younger had higher frequencies of vaginal sex.

Condom Use for Vaginal Sex

Of the 147 respondents who reported vaginal intercourse and answered the condom use question, 54% never used condoms, about one third used condoms inconsistently, and only 14% used condoms all of the time. Of those who reported any condom use and who had usable transcript data ($n = 60$), two thirds used enumeration for the recall of condom use, and 27% used cues (Table 3). The multivariate logistic regression indicated that respondents who used enumeration were less likely to report high frequencies of condom use. In addition, respondents who were asked about the past 3 months versus 2 weeks reported higher frequencies of condom use (Table 4).

Oral Sex

Of those with usable transcript data who performed ($n = 101$) or received ($n = 115$) oral sex, over half used enumeration for recall, and 24% used cues (Table 3). Multivariate logistic regressions indicated that cognitive strategy and time frame were associated with frequency reports: Individuals who enumerated were less likely to report high frequencies of performing and receiving oral sex, and participants who were asked about the past 3 months

versus 2 weeks reported greater frequencies of receiving oral sex (Table 4).

Discussion

The present study investigated cognitive strategies used to recall a range of sexual behaviors among men and women visiting an inner-city public health clinic for the treatment of sexually transmitted diseases. Consistent with hypotheses and prior research on the recall of small quantities (Brown, 1997; Burton & Blair, 1991), we found that respondents used enumeration when they had small numbers of partners or low frequencies of behavior and for recalling behaviors for shorter, more recent time frames. Rate-based strategies were much less prevalent for recalling numbers of sexual partners versus frequencies of sexual behavior. Acquiring new partners may be a more irregular and therefore more memorable event than sexual activity, which may become routinized with the same partner or partners. This interpretation is consistent with prior research showing that enumeration is more likely for distinctive, salient instances and rates are more likely for regular events (Brown, 1997; Burton & Blair, 1991; Menon, 1993).

Defining the strategies used by high-risk individuals to recall sexual behavior is an essential first step in understanding the ways in which these strategies might bias self-reported sexual behavior and ultimately in helping to refine sexual behavior assessments. Enumeration may be more accurate than estimation because individuals who use enumeration may recall the details of each partner or sexual event, especially for shorter time frames. In contrast, those who are at higher risk for HIV—those with a greater number of partners and behaviors—may have a more difficult time recalling all of their partners and behaviors separately and therefore may provide imprecise global estimates that do not take into account, for example, exceptions to the rule or periods of inactivity.

Because cues are stored in memory along with specific events, use of cues may contribute to more accurate retrieval of self-reported information by creating further linkages in memory to specific events (Menon & Yorkston, 2000). However, only a subset of respondents in the present study used contextual cues to

prompt their memory about past sexual behaviors. Thus, there is a clear need for sexual behavior surveys that direct respondents to recall sexual behavior in small, manageable chunks through the use of interviewer prompts. Such prompts have been shown to increase the number of additional partners elicited. For example, in two studies of individuals at risk for HIV (Brewer & Garrett, 2001; Brewer et al., 2005), interviewers used different types of contextual retrieval cues as prompts to elicit additional partners after respondents had already engaged in free recall of sexual partners; combinations of prompts increased the average number of partners elicited by 21% to 40%. Partner-by-partner assessments, in which frequencies of behavior are elicited separately for each partner, similarly use interviewer-specified contextual cues to decompose memory. Such assessments discourage participants from generating global general impressions of behavioral frequencies that include all partners in the same estimate.

The time line follow-back (TLFB) technique is another promising methodology that utilizes interviewer prompts (Carey, Carey, Maisto, Gordon, & Weinhardt, 2001; Weinhardt, Carey, et al., 1998). Respondents are given a blank calendar and asked to fill in key and/or memorable events and milestones (e.g., birthdays, holidays, trips) and therefore to generate their own cues for the time period of assessment. TLFB has been shown to be feasible and reliable, most likely because participants are led to enumerate each event and generate contextual cues, both of which tend to enhance recall. TLFB may be especially useful for reports of behavior with primary sexual partners. Respondents may conflate behaviors for their regular sexual partners because similar behaviors with the same partner may blend together in memory. By helping respondents to generate cues surrounding each individual behavior, use of TLFB may lead to more valid reports.

Limitations to our methodology must be acknowledged. Think-aloud procedures have been used extensively to study a wide range of cognitive processes, including memory and arithmetic calculation (Ericsson & Simon, 1993), although its effects on sexual behavior self-reports are not known. We did not include a control condition of respondents who did not think aloud to arrive at their sexual behavior reports. In addition, low levels of cue usage may have been due to respondents' unwillingness to discuss details of their sexual activities rather than to their actual use of cues. Further, these results are based on a convenience sample from one public health clinic, and most respondents self-identified as heterosexual. Results may not generalize to other settings or other high-risk populations (e.g., men who have sex with men).

In summary, the present study aimed to increase our understanding of the factors that lead to bias in self-reported risk behaviors among a sample of individuals at high risk for HIV and AIDS. Further research is needed to develop survey measures that facilitate accurate recall through the use of appropriate cues and prompts in order to yield accurate data regarding behavioral trends that are furthering the spread of HIV and regarding the effectiveness of interventions designed to curtail it.

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