THE VALIDITY OF SELF-REPORTED DRUG USE AMONG THE INCARCERATED

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This paper presents an analysis of the validity of self-reports of drug use among a population of incarcerated criminal offenders. These data were collected as part of the Washington D.C. Metropolitan Area Drug Study (DC*MADS). DC*MADS is an exploratory study, sponsored by the National Institute on Drug Abuse (NIDA), to look at the nature and extent of drug abuse among all types of people residing in a single metropolitan area during the same period of time, with special focus on populations who are underrepresented or unrepresented in the National Household Survey on Drub Abuse (NHSDA). The analysis and data presented below were conducted as part of the study of the Institutionalized Population (NIDA, 1994).

In the first section of the paper, previous literature on the reporting of drug use among different populations is briefly reviewed. In the second section of the paper, the results of the analysis are presented. In the final section, the results of the analysis are summarized.

1. Research on Self-Reports of Drug Use

Measurement error associated with retrospective questions is a function of the relatively complex processes respondents have to use when providing answers (Sudman and Bradburn, 1974). A number of design factors interact with these processes to contribute to measurement error in the reporting of drug use. For the purposes of the present discussion, three factors are considered: (1) the length of the reference period, (2) the context of the interview, and (3) the type of population being interviewed.

The validity of retrospective questions varies inversely with the length of the reference period (Bushery, 1981; Penick & Owens, 1976). The shorter the reference period, the more accurate the report. Underreporting error may be the result of the respondent completely omitting the event from the interview because of memory failure. Underreporting or overreporting may result when the respondent misdates or telescopes the event (see Sudman & Bradburn, 1974). If the drug use event is misdated into the reference period, for example, then the error leads to an overreport of drug use. If the drug use event is misdated out of the reference period, the error leads to an underreport.

The DC*MADS study interview asked about drug use, by month, since January 1988. Compared to other studies, this reference period (approximately 3.5 years) is relatively long (e.g. Current Population Survey 1 week; NHSDA-1 year). To minimize memory errors, the DC*MADS interview collected drug use data using a Life Events Calendar (Freedman, Thornton, Camburn, Alwin, & Young-Demarco, 1988). This method provided respondents with chronological cues to aid retrieval of information from long-term memory. Another reason for using this method was to increase the respondent's motivation to perform the recall task, by communicating that accuracy was very important to the survey. When administering the calendar, interviewers were trained to probe and to clarify responses that were unclear, to promote accurate recall and minimize discrepancies in reporting.

Previous research suggests that there is net underreporting of drug use (Miller, Turner, & Moses, 1990; pp. 422-430). Rather than memory error, however, this pattern has been attributed to the threatening nature of the topic (Amsel, Mandell, & Matthas, 1976; Harrell, 1985; Nurco, 1985). Respondents may be reluctant to report drug use because they fear either being punished or projecting a negative image (social desirability bias). A number of studies have found relatively high underreporting rates, even though the reference periods have been relatively short. For example, McNagny and Parker (1992) have reported that, among patients at an inner-city walk-in clinic, approximately 50% of the individuals who tested positive for cocaine reported having used the drug in the previous 72 hours. Similarly, studies of arrestees (Collins & Marsden, 1990; Harrison, 1992) have shown a similar rate of underreporting.

An important factor that contributes to intentionally omitting reports of drug use is the context of the interview. In commenting on the study by McNagny and Parker (1992), Rich and Bigby (1992) suggest that respondents may have perceived that the counselors (who served as interviewers) disapproved of drug use or even had the power to deny treatment if the respondent admitted to drug use. Similarly, arrestees included in the Drug Use

Forecasting (DUF) data collections have not been officially arraigned and tried for their offenses. Because their interviews typically take place in some type of jail or booking facility, the admission of drug use may be perceived as providing evidence to either deny bail or to convict.

While there may be net underreporting of drug use, several researchers have argued that, all else being equal, populations that are known to have high rates of drug use may be less reluctant than a general population to admit to drug use. Individuals may be especially willing to admit to drug use if they know that their responses will be compared with the results of a drug test (Harrell, 1985; Watters et al., 1992). If the proper procedures have been implemented to minimize the threat of the situation, these populations may actually be more inclined than general populations to discuss their drug use. Amsel et al. (1976) have reported, in a study of drug use among parolees, that 76% of those who tested positive for any drug self-reported drug use during an interview. For the study by Amsel et al., precautions were taken to minimize the threat to the respondent by recruiting interviewers who would be trusted and by making assurances of the confidential and voluntary nature of the interview. Similarly, Watters et al. (1992) found that 86.3% of a sample of drug users testing positive for cocaine use also self-reported cocaine use. Watters et al. utilized a clear informed consent procedure, which included telling the respondents that they would be asked to provide a urine sample after the interview.

Given the important influence of context on measurement error, the protocol for the DC*MADS interviews was designed to be as nonthreatening as possible. Strong confidentiality guarantees were in place including a certificate that protected the interview from court subpoena. The interview took place in a private setting, where only the interviewer and the respondent were present. Interviewers were trained to be sensitive to the confidentiality concerns of the respondent and to provide clear assurances that the respondent's name would never be associated with any of the answers he or she provided.

To investigate the extent of error associated with drug use reporting on the DC*MADS interview, an attempt was made to validate a subset of the study interviews by comparing self-reported drug use data with the results of urine tests administered by metropolitan area criminal justice agencies. These urine tests can detect the presence of drug metabolites for varying periods of time, depending on the type of drug. The tests can detect opiates and cocaine used up to 72 hours before testing. Marijuana can be detected for up to 30 days and PCP for up to 8 days, depending on dosages and chronicity of use, among other factors (Council on Scientific Affairs, American Medical Association, 1987).

2. Study and Sample Design

The analysis described below is based on a sample drawn to represent persons that were institutionalized in the DC metropolitan area. The sample was drawn in two stages: 1) institutions proportionate to size and 2) individuals within institutions. Facilities included in the study included correctional, psychiatric, group homes and other types of institutions (e.g., homes for the abused, dependent or neglected, training schools for juveniles). The sample frame did not include nursing homes, which constitute a very large portion of the population typically defined as "institutions" (see NIDA, 1994 for a limitations of the sample frame when generalizing to the institutional population). The data reported below are restricted to those who were interviewed in adult correctional facilities.

The interviewing resulted in an 89% response rate. The interview covered a wide variety of topics, including demographics, drug use (and associated behaviors), life history, drug treatment, legal issues, physical health, psychological status and sources of income. As briefly mentioned above, to collect information on drug use, a "life history calendar" was used. This procedure was implemented by having the interviewer ask the respondent to fill out a month x month history between 1988 and the time of the interview (1991). This consisted of having respondents report their residence, employment status and any other significant events that may have occurred during this time period. Once the history was filled out, the respondent was asked to report their drug use, by type of drug, for each month between 1988 and the interview. For each month, therefore, the interview collected how often the respondent used a particular drug.

In some parts of the DC metropolitan area, arrestees are tested for illicit drug use immediately after arrest. For a subgroup of the incarcerated population interviewed in the study, it was possible to link these test results to the interview data. This link was completed for all incarcerated persons who were arrested in these areas and who provided consent to access their records. This informed consent asking for access to the urine records was administered after the interview had been completed. This consent did not include a specific reference to accessing the urine test information but to their institutional records. Of the

eligible population with urine test data, 97% consented to allow access to their records.

The urine test data contain the result of each test completed for each arrest since January 1988. If an individual had been arrested multiple times in these areas, there would be multiple test results available for analysis. For the analysis discussed below, each test result was compared to the self-reported drug use frequency provided by the respondent during the interview for the month the arrest occurred. For the purposes of this analysis, each arrest-report pair was treated as a separate case. That is, respondents who were arrested more than once and who had multiple drug test results were represented in the data set multiple times.

3. Arrest Testing and Self-Reports

Table 1 provides measures of underreporting, overreporting, and concordance using these data. The drugs available for analysis included cocaine, heroin, and phencyclidine (PCP). When interpreting the data in Table 1, one should keep in mind that for cocaine and heroin, the drug testing data apply for up to a 72-hour period before arrest. For PCP, metabolites are detectable for up to 8 days after drug use. The self-report data applied for the entire month in which the arrest took place. Because of these incongruities between the time frames for the self-report and urine test data, there were individuals who may have used the drug during the month but tested negative because the use was outside the time period during which the drug was detectable by urinalysis. To the extent that these individuals did not report any drug use, the measure of underreporting would be too small (i.e., there were more people who used the drug but did not report it). Conversely, to the extent that these individuals reported using the drug, the estimate of overreporting would be too high.

Several interesting patterns are evident in Table 1. First, respondents significantly underreported drug use for the month of interest. The extent of this underreporting varied by drug type. For cocaine and heroin, approximately 40% of the positive drug tests did not have a corresponding self-report in the study interview. Underreporting was significantly higher among those testing positive for PCP; approximately 81% of positive tests were not accompanied by a self-report during the interview. Overall, concordance is relatively high. However, for heroin and PCP, this is due to the large numbers who report no use and test negative for the substance. Nevertheless, self-report data capture the majority of cocaine and heroin use. (At the time of the facility-based urine test, self-reported prevalence rates for cocaine and heroin use were 58.6% and 16.6%, respectively, in comparison to the rates that would have been generated solely from urinalysis -- 71.0% and 19.4%, respectively). PCP use is much less accurately self-reported.

Table 1 Comparison of Monthly Self-Reports of Drug Use with Urine Tests Administered at Corresponding Month of Arrest

	Self-Report		
A. COCAINE	-	+	Total
Urine Test Results			
-	143	28	171
+	183	236	419
TOTAL	326	264	590
% positive tests with negative reports (underreport)		=	*43.7*
% positive reports with negative (overreport)		=	*10.6*
% test-report agreement (concordance)		=	*64.2*

	Self-Report		
B. HEROIN	-	+	Total
Urine Test Results			
-	460	29	489
+	47	71	118
TOTAL	507	100	607
% positive tests with negative reports (underreport)		=	*39.8*
% positive reports with negative (overreport)		=	*29.0*
% test-report agreement (concordance)		=	*87.5*

	Self-Report		
C. PCP	-	+	Total
Urine Test Results			
-	469	24	–
+	90	21	111
TOTAL	559	45	604
% positive tests with negative reports (underreport)		=	*81.1*
% positive reports with negative (overreport)		=	*53.3*
% test-report agreement (concordance)		=	*81.1*

This difference between the rate of underreporting for PCP relative to other drugs was consistent with the results of other studies involving arrestees (Collins & Marsden, 1990). Several explanations could account for this high rate. First, it

may be that drug users are more sensitive about admitting PCP use than cocaine or heroin use, although it is not obvious why this would be the case. Second, it may be that the respondent had used PCP without his or her own knowledge, if, for example, PCP had been used as an adulterant in another drug (Collins & Marsden, 1990).

Compared to several studies that have validated self-reports of drug use among criminal justice populations, the underreporting rate in this study was slightly lower. Using a 15-month reference period, Dembo, Williams, Wish, and Schmeidler (1990) found an underreporting rate for cocaine of 41% among a sample of detained youth. As mentioned above, an analysis of data from the Drug Use Forecasting interviews (Harrison, 1992) found a 55% underreporting rate for cocaine among arrestees, while Collins and Marsden (1990) have reported a similar rate of 59% among a sample of arrestees in three cities; both of these studies used a reference period of 1 week or less. This compares to the DC*MADS interview which had a reference period of 3.5 years.

The rate is comparable to the reporting of health care utilization data (e.g., hospital stays and doctor visits). Marquis (1986) has cited research by Lowenstein (1969), who found a 52% rate of underreporting for doctor visits in the 7 months before the interview. Cannell and Fowler (1963) found a 23% underreporting of the number of doctor visits during a 2-week period, and Balamuth, Shapiro, and Densen (1961) found an underreporting rate of 36% for any visit to the doctor during a 2-week period. Comparison to these studies is interesting because it contrasts reporting highly sensitive information (drug use) with less sensitive information. The comparison here suggests that underreporting rates are comparable when examining reports over extended periods of time.

Table 1 also contains a measure of overreporting and concordance between the drug test and self-report data. These data indicate that the estimate of overreporting varied by the type of drug: Overreporting was lowest for cocaine (10.6%), followed by heroin (29%) and PCP (53%). This pattern across cocaine and heroin was similar to the pattern of underreporting identified in the Drug Use Forecasting results (cocaine, 5%; heroin, 16.7%; see Harrison, 1992).

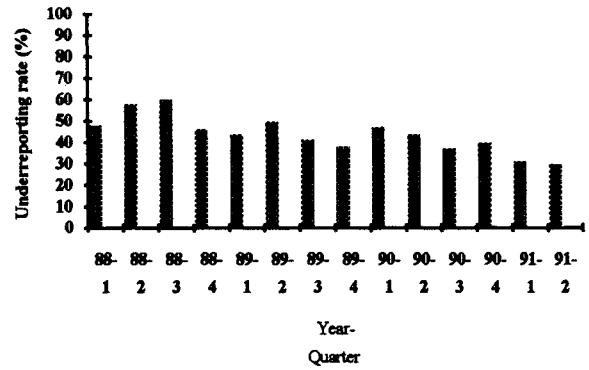
Comparisons between this and other studies must be undertaken cautiously, given the incongruities between the time period during which drug tests detect use and the time unit used in the study interview (i.e., 1 month). As mentioned above, these incongruities could result in either (or both) under- and/or overestimates of measurement error.

As discussed in the introduction to this section, there are several explanations for underreporting of drug use:

1. Respondents were threatened by the topic, because they feared either reprisal or social disapproval.
2. Respondents were unable to correctly remember whether they were using the drug at the time of arrest.
3. Respondents may have honestly reported not using the drug because they were unaware of the contents of the ingested drug.

While previous research has emphasized the first explanation as the most important influence, the results of the current analysis indicate that the second explanation -- the respondent's inability to remember drug use at the time of arrest -- also had a strong (if not stronger) influence on rates of underreporting. Figure 1 illustrates the importance of memory errors by displaying the rates of underreporting for cocaine by the calendar quarters between 1988 and 1991.

Figure 1. Underreporting + Rate for Cocaine Use by Quarter



Number of Positive Tests*:	23	38	27	24	28	32	43	24	32	21	27	43	36	21
Number of People:	20	31	25	21	25	29	42	24	28	20	26	40	34	18

Source: DC*MADS Institutionalized Study, 1991.
+ Percentage of positive tests for cocaince at time of arrest with negative self-report of cocaine use during the past month.
* A person could have tested positive more than once in a quarter (e.g., in 88-1 there were 23 positive tests among 20 different persons).
The number of positive tests in th quarter was used as the denominator of the underreporting rate.

This plot is useful because it provides one way of distinguishing between memory errors and intentional

concealment of drug use. If memory error were a problem, one would expect the rate of underreporting to decrease as the month of the test result approached the month of the interview. If, however, the respondents were intentionally concealing drug use, one would expect underreporting to increase with proximity to the interview date, assuming that respondents would be more reluctant to provide information on more recent drug use.

As the figure shows, the pattern of underreporting seems to be more consistent with memory error than intentional concealment. The proportion of respondents testing positive for drug use who actually reported drug use increased with the recency of the test date. For example, for drug tests conducted in the first quarter of 1988, only 52% of those testing positive for cocaine use reported having used the drug in the month of arrest. In contrast, 71% of the positive tests in April to June 1991 were accompanied by a positive self-report.

Error associated with retrieval from memory may result in either omitting or misdating an event. To explore these two possibilities, Table 2 presents information on the validity of self-reports of cocaine use, with two levels of "tolerance" for the self-reports.

Table 2 Percentage of Negative Self-Reports Among Those Testing Positive at Time of Arrest, by Year and Dating Tolenance

Year	Dating Tolerance	Percent of Positive Tests w/ Negative Self-Report	Number of Positive Tests
1988	Same month	54	
	± 1 month	47	112
1989	Same month	43	
	± 1 month	35	127
1990	Same month	41	
	± 1 month	32	123
1991	Same month	30	
	± 1 month	16	57

Source: DC*MADS Institutionalized Study, 1991.

For each year, the first row shows the underreporting rate for cocaine. The second row within each year shows an alternative underreporting rate, calculated by including any positive report in the month before and the month after the positive test as an accurate report. If memory error had resulted in telescoping, the more inclusive reference period should significantly improve the accuracy of self-reports. This possibility seems to have been confirmed here; that is, using a wider reference period around the month of arrest seemed to improve recall accuracy. The greater improvements in the accuracy of self-report data occurred with more recent arrests. Thus, for drug use that was more distant in time from the interview, respondents tended to forget (or omit) that they had used the drug. For drug use that was closer to the interview, respondents may have remembered drug use but misdated when it occurred.

4. Summary

The results reported above can be summarized as follows:

- Self-reports of drug use were moderately accurate indicators of drug use during the month of arrest. Self-reports of PCP use were less accurate than those for heroin and cocaine use.

- The apparent rate of underreporting of drug use among this subsample of respondents was slightly lower, at least for cocaine, than that identified in studies of comparable criminal justice populations.

- Memory errors, such as omissions and telescoping, were important reasons for underreporting drug use.

- Telescoping error was more likely to occur as the date of drug use approached the interview date. Omissions were more likely to occur with greater distance between the date of drug use and the interview date.

Overall, these results emphasize the need to view measurement error associated with self reports of drug use within a model that considers not only social desireability, but also other cognitive and motivational dynamics associated with the response process.

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