Challenges in Assessing Substance Use Patterns in Persons With Comorbid Mental and Addictive Disorders

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Assessment of substance use patterns can be distinguished from two related assessment goals. These consist of screening (i.e., identifying persons with addiction problems) and diagnosis (i.e., determining whether abuse or dependence criteria are met). All three goals are important and relevant to persons with comorbid disorders. Nonetheless, this chapter focuses on substance use assessment for three reasons. One, it is the least studied assessment goal in the comorbidity literature; very few published studies address this topic. Two, substance use assessment is applicable to all persons in treatment for mental disorders. Use of illicit drugs or alcohol is more common than abuse, and information about use patterns may be desired to determine risk for medication-drug interactions and other health concerns. Finally, substance use assessment should play a central role in the treatment of comorbid disorders. It serves as the basis for treatment planning and as a point of departure for outcome assessment. It also constitutes the first step in conducting a functional analysis of drinking and/or drug use for an individual (Sobell et al. 1988). Quantifying patterns of substance use allows for determination of increased versus decreased use, an outcome measure consistent with harm reduction approaches to treatment of substance misuse in the context of major mental disorders (Carey, in press).

In the addictions literature, a rich tradition of research exists on topics related to assessing alcohol and drug use patterns. Ample sets of instruments and guidelines for their use have been developed and standardized in substance abuse treatment settings. However, importing such tools for use with persons with major mental disorders raises questions about their psychometric properties and other potential limitations. This chapter briefly summarizes current approaches to, and problems with, substance use assessment. Because self-report measures continue to be widely used, emphasis is placed on factors generally considered to affect the accuracy of self-reported substance use. Next, concerns about the reliability and validity of self-reported substance use in persons with major mental disorders are discussed. Finally, recommendations for enhancing the reliability and

validity of assessment instruments are presented, highlighting areas in need of empirical research.

CURRENT APPROACHES TO SUBSTANCE USE ASSESSMENT

To borrow a scheme used by Skinner (1984), options available for sub- stance use assessment include (a) prospective methods, (b) retrospective methods, and (c) objective indicators. Prospective methods consist of variants on self-monitoring. Self-monitoring reduces reliance on memory, and is generally regarded as the most accurate alternative to direct observation. Successful self-monitoring does, however, require a subject with the skills and motivation to complete the task. Prospective information gathering also requires time. Retrospective methods involve asking the subject to report on past substance use over a designated time interval. Examples include the Addiction Severity Index (ASI) (McLellan et al. 1980), the Time Line Follow-back interview (TLFB) (Sobell and Sobell 1992), and various quantity-frequency methods (e.g., Cahalan and Room 1974; Polich et al. 1981). Retrospective self-report is practical for most settings and is the most frequently used. However, its drawbacks include the potential for memory failure or other sources of distortion. Objective indicators include blood- or urine-based drug screens, breathalyzer tests, laboratory tests (e.g., gamma-glutamyl transpeptidadase, high density lipoproteins, mean corpuscular volume), collateral reports, and official records. Each of these information sources has limitations. Breathalyzer tests and blood/urine screens yield information about recent use only (Schwartz 1988). Other laboratory tests identify medical consequences of substance use, but are generally sensitive only to prolonged high levels of use; furthermore, elevations are nonspecific to substance use. None of these indices yields data on the pattern of substance use. Collateral reports or other official records tend to be limited due to incomplete knowledge or representation of actual use history, and collaterals may be unavailable for some socially isolated subjects (Drake et al. 1993; O'Farrell et al. 1984).

In the absence of a gold standard, confidence in the accuracy of assessment can be enhanced by adopting a convergent validity approach (Sobell and Sobell 1980). This involves using multiple indicators that will tend to converge on a consistent picture of actuality. Significant discrepancies must be evaluated from a methodological perspective as well as allowing for subject-specific factors. In any given population, consideration must be given to

appropriate selection of measures as well as to ways in which their accuracy can be enhanced. Since retrospective self-reports continue to serve as the cornerstone of assessment, factors affecting the validity of self-reported substance use will be considered next.

Factors Affecting Validity of Self-Reported Substance Use

For substance use assessment to be useful in a treatment context, measures must be both accurate and sensitive to change. The literature on accuracy indicates that acceptable levels of reliability and validity are found for alcoholics' self-reports when recommended procedures are followed (e.g., O'Farrell and Maisto 1987; Sobell and Sobell 1980). However, some samples and procedures have yielded less than impressive findings. Furthermore, the reliability and validity of self-reported drug use varies across both studies and types of drugs (Maisto et al. 1990). Test-retest reliability is infrequently reported and, when it is, shows only modest reliability coefficients. Validity coefficients tend to be similarly moderate. A reasonable conclusion is that self-report data are "inherently neither valid nor invalid, but vary with the methodological sophistication of the data gatherer and the personal characteristics of the respondent" (Babor et al. 1990, p. 8).

In the substance abuse field, questions have thus moved beyond "Are self-reports valid?" and are framed more as "When, and under what conditions, are self-reports valid?" (Brown et al. 1992). It is this approach to evaluating the accuracy of self-reports that provides a framework for understanding the process of substance use assessment among persons with major mental disorders.

In a discussion of the factors affecting the accuracy of self-reported substance use, Babor and colleagues (1990) highlighted four classes of variables. The first class yields characteristics of the respondent. These include the respondent's state of sobriety at the time of assessment and the possible influence of a social desirability response set. The second class of variables includes aspects of the task that might enhance or detract from accurate responding. These include the degree of rapport between assessor and respondent, whether assurances of confidentiality can be made, the likelihood that self-reports will be verified, the criterion interval reported on, and the clarity of the questions. Motivational factors constitute the third class of variables affecting accuracy of self-report. Obvious short-term goals (e.g., to obtain treatment or to avoid arrest) must be considered, as well as the fear of potentially judgmental attitudes or other threats to the respondent's self-esteem. Cognitive processes constitute the

fourth type of variables influencing self-report accuracy. Impairment of attentional processes, verbal comprehension, or retrieval will interfere with the accuracy of an assessment. Cognitive processes may be impaired due to recent alcohol or drug use, to situational stress or anxiety, or to associated psychiatric syndromes such as depression. In addition, recall of past behavior is subject to information-processing biases, so that recall is disproportionately influenced by salient and/or very recent events.

Application to Persons With Severe Mental Disorders

There are reasons for concern about the reliability and validity of substance use assessment in persons with severe mental disorders (e.g., schizophrenia, bipolar disorder, major depressive disorder). Several studies suggest significant underreporting of substance abuse in this population (e.g., Safer 1987; Shaner et al. 1993; Test et al. 1989). No formal reliability or validity studies have been published on substance use assessment, but the accuracy of screening measures has been empirically addressed. For example, the criterion validity of screening measures (e.g., the Michigan Alcoholism Screening Test) has been evaluated in psychiatric settings. Results indicate adequate sensitivity but low specificity (Drake et al. 1990; Teitelbaum and Carey, in press), suggesting that population differences may affect the psychometric properties of many of the standard industry tools. A recently completed literature review (Teitelbaum and Carey, in press) found surprisingly few studies addressing the reliability of alcohol/drug screening or diagnostic measures used with psychiatric patients. In this population, which is characterized by fluctuating mental status, the issue of test-retest stability is a fundamental psychometric concern.

Clinical characteristics of persons with major mental disorders offer many potential sources of unreliability and/or invalidity. For example, in an emergency room setting, Barbee and associates (1989) found that significant numbers of schizophrenic patients were unable or unwilling to complete structured interviews. The presence of acute psychotic symptoms can impair reality orientation, thus invalidating responses. Common correlates of mental disorders such as hostility and psychosocial instability raise concerns about compliance and cooperativeness with assessments. Interactive effects of recent substance use, psychiatric symptoms, and prescribed medications increase the risk of cognitive impairment. In addition, some persons with mental disorders report concerns about the impact of accurate reporting on their psychiatric treatment. Fears about losing access to

medications or being transferred to another facility may motivate underreporting of substance use (Ridgely et al. 1990). Finally, anxiety about further stigmatization because of multiple disorders may come into play.

Such clinical concerns suggest that important variables may include (a) the setting in which the assessment takes place (e.g., emergency room versus community mental health center); (b) the timing of the assessment (on admission versus later in treatment); and (c) institutional policies on providing integrated versus separated treatment. However, empirical data to evaluate these possibilities are unavailable. Clearly, there is a need for procedures paralleling the efforts by researchers in mainstream substance abuse settings to document the respondent, task, motivational, and cognitive factors that might affect the reliability and validity of self-reports in mental health settings. At the present time, however, even preliminary demonstrations supporting the accuracy of self-reported substance use patterns are lacking.

STATUS OF EMPIRICAL LITERATURE ON SUBSTANCE USE ASSESSMENT IN THIS POPULATION

Data from an ongoing study provide preliminary evaluations of the concurrent validity of self-reported alcohol and/or drug use. The subjects are outpatients at a state psychiatric center in a medium-sized city in upstate New York; all are voluntary participants in a longitudinal investigation of the psychosocial aspects of functioning of persons with severe mental disorders. The data provide information on the extent of agreement between self-reported substance use (obtained from the ASI) and information provided by collateral reports and urinalysis results, and also allow comparison of the concordance between self-reported drinking on two separate measures. Finally, the TLFB is evaluated with respect to known groups' validity.

ASI and Collaterals

Forty-five subjects provided data for this analysis. All were outpatients, three-quarter had been given schizophrenia-spectrum diagnoses, and one-quarter had been diagnosed with bipolar disorders. Most were male (84 percent), and 92 percent received pensions for a psychiatric disability. Each subject identified a collateral who could provide information about the subject's substance

use and other functioning. Collaterals were interviewed over the phone within a few days of an interview with the subject. A third of the collaterals interviewed were in daily contact with subjects, a third saw subjects weekly, and another third saw subjects at least once during the target month. Friends (often fellow patients) and treatment/residential staff were most often identified as collaterals.

For 10 substance use categories, subjects were asked how many days in the past 30 they had used the substance, following standard ASI interview procedures. The collaterals were asked, "To the best of your knowledge, did (insert subject's name) use this substance in the last 30 days?" To make responses comparable, subjects' estimates of frequency were collapsed into a simple use/no use index.

As shown in table 1, six categories were endorsed; for these the percentages of agreement ranged from 84 to 98, primarily due to the high levels of agreement that no use occurred. Inspection of the kappa coefficients (Cohen 1960) indicates no association above that expected for chance in the majority of drug categories.

Subjects admitted 24 instances of substance use, which included multiple use by single subjects, but collaterals were able to corroborate subjects' recent use history accurately in only 7 instances. In the other

TABLE 1. *Concordance between self-report and collateral report of use in the past 30 days.*

Substance	ASI Collateral	- -	+ +	+ -	- +	% agreement	kappa
Alcohol--any use		36	4	5	0	89	0.56
Alcohol--to drunkenness		38	0	7	0	84	0.00
Marijuana		42	3	2	0	96	0.75
Benzodiazepines		46	0	1	0	98	0.00
Cocaine		46	0	1	0	98	0.00
Amphetamines		46	0	1	0	98	0.00

KEY: "+" = a positive report of use; "-" = a negative report of use (i.e., no use in the past month).

17 instances, subjects reported more use than did the collateral. These findings are consistent with previous research on collateral verification in nonpsychiatric samples that has found a tendency towards

underreporting by collaterals (O'Farrell and Maisto 1987). The nature of the collaterals identified by subjects confirms suspicions that, for many mentally ill persons, a collateral who is both reliable and knowledgeable about sub-stance use may be unavailable (Drake et al. 1993). Notably, however, there were no cases where collaterals alerted the author to substance use that subjects did not report. The nature of subject sample undoubtedly accounts in large part for the lack of surprises; subjects were psychiatrically stable, most were engaged in treatment, and their sobriety at the time of assessment was documented. Thus, during the course of the research interviews, it was possible to follow many of the recommended procedures presented later in this chapter.

ASI and Urinalysis

The results of urine tests were also used for validation. It is important to keep in mind that the time spans of these measures differ (i.e., the ASI addresses the past 30 days, and urine tests are usually sensitive only to a few days), making urine tests imperfect methods for confirming self-reports of substance use patterns over an extended period. However, the major concern was the occurrence of negative self-reports and positive urine test results, which would indicate underreporting of even salient recent use.

Both kinds of data were available for 53 outpatients. Table 2 shows percentages of agreement and kappa coefficients for the seven categories of substances that yielded positive findings. The lowest agreement rates were obtained for alcohol and marijuana, which many subjects admitted to using but which were not picked up on urinalysis. Of the six positive urines obtained, three were not substantiated by self-report (two for cocaine and one for barbiturates). Thus, even a relatively insensitive validation tool gave reason to suspect underreporting of some drugs. These findings need to be replicated, especially in samples with higher base rates for substance use.

Concurrent Self-Reports

Evaluation of the concurrent validity evidence for self-reported frequency of alcohol use was also possible, using data from both the ASI alcohol

TABLE 2. *Concordance between self-report and urinalysis.*

| Substance	ASI Urinalysis	- -	+ +	+ -	- +	% agreement	kappa
Alcohol		41	0	12	0	77	0.00
Marijuana		45	1	7	0	87	0.23
Cocaine		50	1	0	2	96	0.43
Amphetamines		52	0	1	0	98	0.00
Barbiturates		52	0	0	1	98	0.00
Benzodiazepines		51	1	1	0	98	0.66
Narcotics		52	0	1	0	98	0.00

KEY: "+" = confirmation of use (by self-report or urinalysis result);
       "-" = no self-report of use or two negative urinalysis results.

section and the TLFB procedure. Both yield estimates of the number of days the subject drank in the past 30. Techniques for eliciting this information vary, however. The ASI asks for the number of drinking days during the past 30 as a single question, whereas the TLFB presents the visual prompt of a calendar, and uses numerous other memory prompts to elicit daily drinking information (see Sobell and Sobell 1992).

To repeat, subjects were adult psychiatric outpatients, predominantly male (83 percent) with schizophrenic-spectrum diagnoses (75 percent). These tend to be a chronically dysfunctional group; none were employed full-time, and 92 percent were psychiatrically disabled. Overall, the correlation between the two measures of alcohol use was 0.75 ($p < 0.0001$); figure 1 gives a graphic display of the relationship. In 39 of 52 assessments (75 percent), no drinking was reported on both measures. Only three of 52 denied drinking on one measure but admitted to drinking on the other, and, in all three cases, the TLFB identified drinking days when the ASI did not. In 10 of the 13 instances in which drinking was reported (77 percent), the drinking was identified on both measures. In seven cases, more drinking days were reported on the TLFB; the opposite was true in only three cases.

These data suggest that the TLFB strategy may yield higher estimates of drinking than the ASI, at least over a 30-day interval. This finding may be explained by the structure of the interview, because the TLFB uses
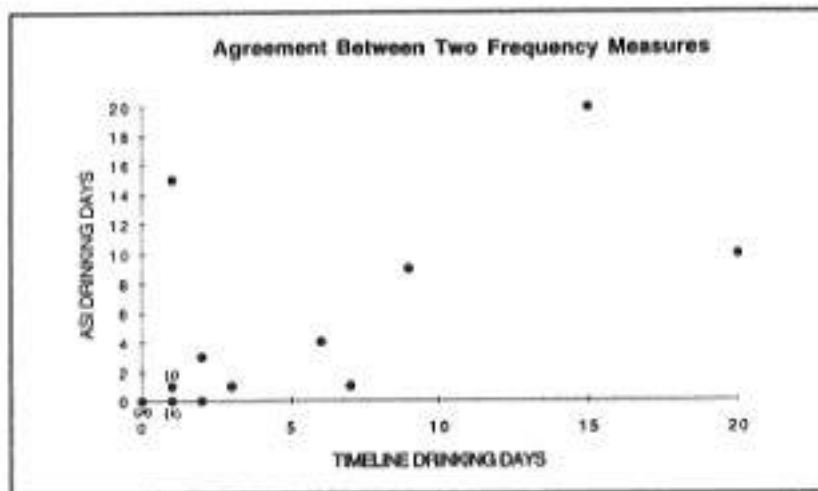
FIGURE 1. *Agreement between two frequency measures.*

multiple verbal and visual prompts for recalling events that might be associated with drinking. However, the potential advantages of the TLFB strategy should be weighed against its potential limitations. Although it may be more accurate, it is also more time consuming. The accuracy of TLFB assessments covering more than 30 days should also be explored in order to determine representative baselines. In any case, differences between methods of eliciting alcohol use information with chronically mentally ill subjects should be evaluated further.

Known-Groups Validity

Finally, this research yields data that permit a preliminary validation of the TLFB on known groups. Of 64 outpatients who were evaluated with the SCID and who completed a 6-month TLFB, 13 qualified for an alcohol abuse or dependence diagnosis in the past 6 months; these are labeled abusers in table 3. Abusers reported significantly fewer abstinent days and consistently more drinking days in the past 6 months than nonabusers. Unequal variances for light, moderate, and heavy drinking days account for the absence of significant group differences on these variables. Abusers also reported significantly greater maximum quantities (in numbers of standard drinks) consumed on a single day.

Similarly, primary therapists rated subjects on the Case Manager Rating Scale (Drake et al. 1990), an ordinal scale developed and validated by

TABLE 3. *Self-reported alcohol use by subjects grouped according to abuse/dependence status.*

	Self-reported alcohol use from timeline follow-back				
SCID alcohol abuse or dependence status	Abstinent days*	Light days	Moderate days	Heavy days	Maximum quantity**
Nonabusers (N = 51)	172.51	3.76	1.51	2.23	2.08
Abusers (N = 13)	132.61	17.31	10.77	19.31	9.69

KEY: * = $p < 0.05$; ** = $p < 0.001$; SCID = Structural Clinical Interview for DSM-III-R.

Drake and colleagues that reflects the following degrees of alcohol use over the previous 6 months: no use, mild use but no problems, moderate use with some resulting problems, severe problems, and extremely severe problems probably resulting in hospitalization. All but one subject received ratings in the first three categories, so that only the 63 subjects assigned to the no use, mild, and moderate use categories were used for analysis. As shown in table 4, subject-generated TLFB data covering the same 6-month interval seem to be consistent with therapists' ratings. While finding predictable group differences on a measure does not indicate an accurate reflection of reality, it does suggest that subjects who are perceived by professionals as having more alcohol involvement do report more nonabstinent days and heavier alcohol consumption.

Enhancing the Accuracy of Substance Use Assessment

By integrating the above data and the literature (see Drake et al. 1993; Nurco 1985; Skinner 1984; Sobell and Sobell 1980), it is possible to offer several recommendations for enhancing the accuracy of

substance use assessment among persons with major mental disorders. These are organized below according to the four-factor scheme presented earlier.

TABLE 4.   *Self-reported alcohol use by subjects groups according to therapists' ratings.*

Case manager rating scale determination	Self-reported alcohol use from timeline follow-back				
	Abstinent days[a]	Light days	Moderate days	Heavy days[b]	Maximum quantity[c]
No use of alcohol (N = 35)	178.00	0.83	1.17	0.05	1.49
Mild use, no problems (N = 17)	159.71	10.29	2.35	8.64	4.29
Moderate use, some problems (N = 11)	124.67	22.56	5.89	26.89	12.44

KEY: a = $F_{(2,55)}$ = 10.77, $p < 0.0001$; moderate use < mild use and no use; b = $F_{(2,55)}$ = 6.62, $p < 0.003$; moderate use > no use; c = $F_{(2,55)}$ = 13.50 , $p < 0.0001$; moderate use > mild use and no use.

Respondent Characteristics

•   Assess when the subject is psychiatrically stable. Available evidence suggests that less accurate reports are likely to be obtained on admission interviews or in more acute care settings (e.g., Barbee et al. 1989; Shaner et al. 1993) than among stable outpatients. Even in the absence of an underreporting bias, impairment in reality testing may have unpredictable effects on self-reported substance use patterns. The conditions under which psychotic symptoms impair self-report accuracy remain to be documented empirically.

• Assess when the subject is not intoxicated or in withdrawal. Many studies of primary substance abusers have found less accurate reporting when subjects were intoxicated (e.g., Brown et al. 1992). This finding should also generalize to mentally ill substance abusers. Another lesson from the substance abuse literature suggests using objective measures of intoxication (i.e., breath or urine tests), because even trained interviewers are not always able to detect intoxicated individuals (Sobell et al. 1979).

Motivation

• Use self-report in conjunction with other sources of information (lab tests, collaterals), and tell subjects that self-report will be checked against other sources. This convergent validity approach to substance use assessment (Sobell and Sobell 1980) enhances confidence in the validity of self-reports when sources converge and identifies discrepancies when they diverge. In this research, subjects know from the time of informed consent that breath and urine tests will be performed and that collaterals will be called. Although it is not possible to empirically test the effects of these procedures on the accuracy of self-reports in a mental health setting, this common procedure should reduce the likelihood of deliberate underreporting.

• Provide assurances of the confidentiality of the data, when possible.

• Evaluate whether the subject has reasons for distorting his or her reports, and address those motivational factors. Common concerns include losing access to medications, change in treatment site, or legal ramifications if the full extent of substance use is known. It is likely that fully integrating substance abuse treatment into mental health treatment will reduce both the motivation to compartmentalize symptoms and the fear that honesty about substance use will complicate ongoing treatment.

Task Variables

• Conduct substance use assessment after assessing other areas of life functioning and history. This sequence helps to build rapport and raises the interviewer's awareness of

the subject's competencies and limitations that can assist in the interpretation of self-report data. Of relevance here is the frequent finding that alcoholics give less reliable and valid information at pretreatment assessments than during treatment or posttreatment assessments (Skinner 1984). This suggests that the degree of rapport and/or trust developed over time influences subjects' willingness to accurately report alcohol or drug use.

• Use nonjudgmental interviewers who are comfortable with the vocabulary of substance use and familiar with substance use patterns.

• Use simple, direct questions and clearly defined timeframes. This research focuses on frequency rather than on quantity, which can be more difficult to specify. However, the author's data suggest that maximum number of drinks consumed on a single day distinguishes those who experience drinking problems and those who do not.

As for timeframes, the author has found that focusing on substance use over the last month has worked well. In this population, use patterns tend to vary over time, interrupted by changes in functional abilities, hospital-izations, or constrained by financial limitations. Such irregular patterns of use tend to be harder to describe than very regular use, especially with averaged quantity-frequency methods. The utility of timeline assessments over varying intervals should be explored.

• Use open-ended questions and normalize substance use to make it more likely that subjects will admit to heavier quantities and greater frequencies when relevant. As pointed out by Babor and colleagues (1990), people tend to avoid extremes when fixed options are provided. Framing the questions in a way that normalizes a wide range of use patterns yields a wider range of reports; an example is "Many people have experimented with drugs in their lives . . . which of the following have you had experience with . . . " The majority of severely mentally ill outpatients report extensive drug histories, even though minimal information may be available in the medical chart. This suggests that there are effective and ineffective methods for eliciting such information.

Cognitive Processes

•   Use the lowest level of specificity or precision consistent with meeting assessment goals. A certain level of specificity is needed to ensure that data are useful for treatment planning and evaluation of change. However, among persons with major mental illnesses, requests for highly specific descriptions of past behavior can be daunting and result in questionably valid responses. Even in the general population, global measures tend to be more valid than specific measures when assessing drug use (Harrell 1985); this pattern may be especially true for persons with comorbid disorders. Thus, researchers must strike a balance between obtaining data that are valid and yet still useful to meet specific assessment goals. The nature of this balance requires study as clinical research efforts begin to include substance use patterns in outcome assessments among persons with major mental illnesses.

•   Incorporate repeated assessments over time whenever possible, taking a longitudinal approach to substance use assessment. This recommendation addresses both cognitive and task concerns. Experience with drug use surveys indicates that recent events are recalled more clearly than remote ones (Harrell 1985), so that frequent assessment over short intervals minimizes dependence on subjects' memories. In addition, direct observations about the psychosocial impact of substance use by staff or other collaterals can supplement reports of recent behavior. Integration of multiple sources of information has been recommended as an effective method of enhancing accuracy of substance use assessment (Drake et al. 1990; Sobell and Sobell 1980). Finally, as mentioned earlier, use patterns in this population tend to vary substantially over time, so that obtaining a representative baseline may require an extended assessment period.

ESTABLISHING A RESEARCH AGENDA

The preceding review identifies several directions for future research. First, basic information on the temporal stability of self-reported substance use patterns among persons with co-occurring mental and addictive disorders is needed. Second, empirical investigation of the effects of various task variables on the accuracy of self-reported

substance use patterns should be undertaken. Relevant variables include the format of the measurement tools (e.g., ASI versus TLFB) and the timeframes employed. Third, it is important to investigate ways of minimizing the impact of respondent and cognitive limitations. In addition to drug-related cognitive impairment, attention must be paid to those aspects of psychopathology that can reduce self-report accuracy and the interaction between the two. Fourth, it would be beneficial to understand the kinds of motivational variables that might distort self-report in this population. Ultimately, these factors will allow a better answer to the question: When and under what conditions are self-reports of substance use valid for persons with major mental disorders?

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