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PREDICTING DRUG USE AT ELECTRONIC MUSIC DANCE EVENTS: SELF-REPORTS AND BIOLOGICAL MEASUREMENT

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Abstract

Most information on the prevalence of drug use comes from self-report surveys. The sensitivity of such information is cause for concern about the accuracy of self-report measures. In this study, self-reported drug use in the last 48 hours is compared to results from biological assays of saliva samples from 371 young adults entering clubs. The relationship between self-reports and drug presence in oral fluid was determined for three substances: cocaine, marijuana, and amphetamine. Forty-one percent of the participants with drugs detected in their oral fluids reported no use in the last 48 hours. The significance of these results is discussed.

Keywords

drug use; self-report; biological assay; validity; electronic music dance event

For the last half century, studies on the epidemiology of drugs have principally been limited to self-report methods. For the most part, the prevalence of drug use was assessed through telephone, household, and school surveys. Although some archival and treatment data contained information on biological assays, these data were applicable principally to dependent and abusive users. Laboratory dose/response studies are strongly restrained by the legal and ethical barriers to administering illicit drugs to research participants. Thus, the amount of objective biological evidence on drug use by individuals who are in trouble with the law or under medical treatment is limited.

Stimulated in part by concerns over transportation safety, drug-screening methods appropriate for use in field research have been developed to monitor substance abuse in the workplace. Initially, such screening methods were based on urine as the test medium. However, urine tests are intrusive and difficult to monitor; this led to interest in collecting oral fluids that can be more easily monitored and is much less intrusive. The drug-screening tests generally used in industry and law enforcement are inexpensive and are designed to provide a quick indication of whether there is a basis for a followup blood test. While developing such simple indicators, collection units were also developed that capture and preserve an oral fluid sample for laboratory analysis. Studies of the relationship between biological assays of oral fluids and blood or urine analyses indicate that oral fluid provides results similar to those obtained in tests of other body fluids. The validity and reliability of using oral fluids, compared with blood and/

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or urine, to detect the presence of illicit drugs has been confirmed in several studies (Verstraete 2004; Schepers et al. 2003; Samyn and van Haeren 2000; Laloup et al. 2005; Leinwand 2002; Wylie et al. 2005; Toennes et al. 2005; Quintela et al. 2005).

The availability of a minimally intrusive method for collecting and preserving oral fluid samples for precision analysis in the laboratory has opened a new opportunity for field research on the epidemiology and prevention of substance abuse. By taking oral fluids technology to locations where substance abuse is prevalent, the limitations imposed on dosing subjects for research are overcome by recruiting self-dosing participants. Further, participants are not limited to individuals who present signs of dependence and abuse, or who were sampled from treatment programs or the criminal justice system. Moreover, the ability to collect objective measures at the times and in the locations where decisions to consume are being made opens the opportunity to investigate environments that attract substance abusers and to evaluate environmental interventions directed at reducing substance abuse.

Because most data on drug use comes from self-report surveys, the relationship of self-reports to biological assay information is of special interest. In this study, we used our portal survey field method (see Voas et al. 2006) to collect both self-reports and oral fluid samples from individuals entering licensed alcohol establishments that were hosting electronic music dance events (EMDEs). Such events, where disk jockeys produce distinctive programs of dance music for their clients, have been popularly associated with high drug use among patrons. EMDEs were chosen as survey sites because they grew out of the *rave* scene, where there was considerable concern regarding drug use (Leinwand 2002) and where there was considerable evidence that they attracted drug users. For example, Arria (2002) surveyed 96 club attendees and found that 89% reported lifetime use of drugs other than alcohol, 49% reported drug use in the past 30 days, and 20% reported drug use during the past 2 days. In our previous research, we found similar high usage rates (Furr-Holden et al. 2006; Miller et al. 2005). EMDEs also appear to attract individuals from diverse backgrounds. For example, in our previous study (Miller et al. 2005), we found that only a third of the attendees reported being students. Thus, the majority of those entering EMDEs are from the understudied working population.

The portal survey procedure is conducted at locations with controlled entrances through which individuals must pass on their way to events where they will be exposed to substance use and other risky activities. Initially developed for use at the U.S. border to study young Americans crossing into Mexico to drink at bars where the drinking age is 18, this methodology has been extended to alcohol-licensed establishments that host EMDEs. The procedure involves contacting a random sample of individuals as they approach the entrance to the bar and requesting their participation in a very brief, anonymous interview and sample collection. The participant fills out a drug use questionnaire while holding the oral fluid collection device in his or her mouth. The total entry interview time takes 5 to 10 minutes. Oral fluid samples are sealed and sent to the laboratory for processing, and results are not available on site. Despite the sensitive nature of the data collected, 98% of those who participated in the survey agreed to provide an oral fluid sample.

In this paper, we consider the relationship of self-reported drug use to independent biological assays based upon oral fluids. We begin by comparing the self-report of drug use in the last 48 hours to the results of the biological assay as measured upon entrance to a club hosting an EMDE. Many drugs we expected to encounter can be detected in oral fluids within this 48-hour timeframe. A possible exception to this is marijuana (delta-9-tetrahydrocannabinol [THC]), which tends to exit the body more quickly (however, because THC is stored in fat cells, it may be possible to detect the drug well after 2 days for heavy marijuana users). Although there are several reasons for potential discrepancies between the self-report and the oral fluid results other than the lack of frankness by participants, it is nevertheless important

to build our information on that relationship so that the continuing collection of self-report survey information can be compared with the growing amount of bioassay data.

METHODS

SAMPLING

Site selection—Data were collected during 12 evenings at 10 clubs from the San Francisco Bay area and the Baltimore/District of Columbia corridor. We recruited clubs from among those identified in observational surveys as being in high- and low-risk locations for drug use (based on prior observational surveys conducted earlier at those clubs). Of the 16 clubs approached, we obtained cooperation to conduct the portal surveys at 10. In conducting the portal surveys, we initially targeted the same event that was observed during the observational portion of the study In some cases, however, that event was no longer occurring at the club. We therefore chose to conduct a portal survey on the same night of the week as the original observation of the club.

Portal survey method—After selecting a club location and night of the week, we then established a portal survey to collect data from patrons as they entered and exited the club. This portal methodology was described in detail and used in prior research studies (Voas et al. 2006; Lange et al. 2006; Lange, Johnson, and Reed 2006). Portal surveys were collected in close proximity to the entrance of the venue where groups of patrons were randomly approached to participate in the study. Our decision to approach groups of participants as they entered the club was based upon previous research conducted in portal settings that showed a lower refusal rate when the entire group participates rather than singling out an individual from the group.

Participant selection—When the interview team leader signaled that an interviewer was available, a research team recruiter selected the next person to cross an imaginary line on the sidewalk (identified before data collection began). The first set of feet that crossed the line identified the individual, along with other members of the group, to be invited to participate. The focus on “feet,” rather than faces, reduced the chance of possible unconscious biases based upon facial or other physical characteristics. If a group refused to participate, recruiters recorded the approximate age, gender, and race of its members. When the recruiter brought the selected group to the interview area, the team leader assigned a unique group number as well as a unique individual number to each person. These numbers were recorded on a wristband and on all data forms associated with the individual. No personally identifying information was collected, and the entire survey was anonymous. Consent information was both read and offered, in written form, to individuals. The information included our contact information. After individuals consented to participate in the study, oral fluid samples were collected and self-reported data were collected.

As patrons exited the club, study participants (identified by their wristbands) were invited to complete an exit survey and to repeat the drug and alcohol tests. In this paper, however, we only examine self-report responses and biological measures of drug use collected upon entry to the clubs.

PARTICIPANTS

Groups selected—Surveys at the 12 events yielded a total of 210 groups that had at least one member participating in the study. The average number of people within a participating group was 1.99 (S.D. = 1.07), although not all individuals in each group participated. Approximately half of the groups (56%) approached agreed to participate, and group-size differences were not significant between the refusal groups and the participant groups. In all,

the 210 groups comprised 371 patrons, 98% of which agreed to provide an oral fluid sample, for a total entry sample for oral assays of 362. Participants with missing entry biological assay data were excluded from the analyses.

MEASURES

Self-reports—For this research, as we recruited participants entering the EMDEs, we interviewed them to collect demographic data such as age, gender, race/ethnicity, etc. In addition, they were asked four questions about their drug use history: (1) drug use during the past 6 months, (2) drug use over the past 48 hours, (3) whether they typically use drugs at EMDEs, and (4) whether they intended to use drugs that evening. Each drug question was asked separately for cocaine, marijuana/hashish, and amphetamines or other stimulants. In addition, an "any drug" measure (aggregated across the three drugs) was computed for each of the four periods. Thus, for this research, 12 self-report drug questions were asked in total. Among the working sample, a total of 307 participants responded to each of the four questions regarding cocaine use; 316 participants responded to all the questions regarding marijuana use, and 309 participants responded to all the questions regarding amphetamine use.

Oral fluid samples—In addition to answering the interview questions, each participant provided a saliva sample using the *Quantisal*™ collection unit (Immunalysis Corporation, Pomona, California). The test unit is placed under the tongue and provides a color change indication of when 1 ml of fluid has been collected. The oral fluid samples were analyzed by the Immunanalysis Corporation. Samples were screened for a drug or drugs, and positives were confirmed with a second testing. This double-screening procedure made the likelihood of false-positives extremely low. The procedure used to analyze the oral fluid samples is described in Samyn, Verstraete, van Haeren, and Kintz, (1999, 15); this procedure can detect cocaine at the 5 ng/ml level, THC at the 1 ng/ml level, and amphetamines at the 10 ng/ml level. Conservative estimates suggest the three classes of drugs can be detected if the oral fluid is sampled within 12 hours after the use of cocaine, 4 hours after the use of marijuana, and 20 hours after the amphetamine (Samyn et al. 1999, 15, Table 4). This suggests that our biological assay may not detect all occurrences of recent (48-hour) drug use, particularly marijuana if used the previous day. Because we can separately identify persons who admit to taking drugs but test negative upon entry and those who deny taking drugs but who test positive, we can tease apart whether a low concordance between self-report measures and biological assays is due to lack of veracity on the part of participants or difficulty in detecting the presence of some drugs.

Substances selected for this study—The oral fluid samples were tested for a number of the major drugs, but only three drug classes had sufficient prevalence among our sample to make them useful for analysis in this study. These were (1) cocaine—including cocaine metabolites (benzoylecgonie-BZE); (2) marijuana/hashish (i.e., THC and its metabolites); and (3) amphetamine and other stimulants (i.e., methamphetamine, 3,4 methylenedioxy-N-ethylamphetamine – MDEA, 3,4 methylenedioxymethamphetamine – MDMA, 3,4 methylenedioxyamphetamine—MDA). Although the biological assays also tested for phencyclidine (PCP), opiates (e.g., heroin, 6-acetylmorphine, methadone), ketamine, and prescription painkillers (i.e., hydrocodone, codeine, hydromorphone, and oxycodone), too few participants tested positive for these substances to warrant additional analysis. Gamma-hydroxybutyric acid (GhB) cannot be tested by biological assays of oral fluid, so it was not included in the research.

STATISTICAL ANALYSIS

We examined the concordance between participants' self-reports of drug use and the results of our biological assays. This served as a validity test of the 48-hour self-report of use of any of the three drugs.

Dependent measures—The research objective was tested using four dependent measures. The first dependent measure was whether participants tested positive for any of the drugs included in the study (cocaine, marijuana, or amphetamines). Our predictor variables similarly referred to self-reported use of any drug; thus, we analyzed whether self-reported use of any of the three drugs predicted testing positive for any of the three drugs upon entry to the EMDE. Our second dependent measure concerned cocaine use specifically, and we examined whether self-reported cocaine use predicted actual cocaine use (as indicated by the biological assay). The third and fourth dependent measures concerned marijuana use and amphetamine use, respectively.

ANALYTIC STRATEGY

We tested the validity of the 48-hour drug use question against actual drug use at entry to the EMDE (separately for each dependent measure). The combination of responses (Yes or No) to the 48-hour question with the outcome of the biological assay (testing positive or negative) created four possible outcomes: participants could (1) report drug use and test positive, (2) report drug use and test negative, (3) report no use and test positive, or (4) report no drug use and test negative. For each We provide Cohen's Kappa as a measure of agreement between the two measures.

RESULTS

ANY DRUGS

A total of 361 participants responded to the self-report 48-hour drug use question and also provided an oral fluid sample upon entry to the EMDE. Regarding our first objective, Table 1 shows the frequencies of self-reported responses arrayed against outcomes of the biological assay, and Table 2 shows the frequencies of biological assay results against the self-reported drug use responses.

For approximately 85% of participants, self-report responses regarding 48-hour drug use and the results of the biological assay matched. Among participants whose self-report and drug test result did not match, twice as many denied drug use but tested positive than those who claimed recent drug use but tested negative. Of participants who tested positive for drug use upon entry to the event, 41% did not report recent drug use during the interview.

The corresponding Cohen's Kappa between self-report and biological measures was .56, $p < .01$, suggesting at best moderate agreement between the two measures (see Landis and Koch 1977, for interpreting Cohen's Kappa). Given the nature of the measures (i.e., biological assays), we would expect a noticeably stronger correlation if the self-report measure was valid. Given the relatively large number of positive test results from persons who denied recent drug use, we interpret this limited relationship as the result of underreporting by participants.

COCAINE

The frequencies of self-reported responses regarding cocaine use crossed with outcomes of the biological assay are provided in Table 3 (biological assay test results by self-report response) and Table 4 (self-report responses by biological assay results). The results reveal that a small proportion (.090) of participants who denied cocaine use tested positive for cocaine, and only one participant (.003) who claimed cocaine use but tested negative upon entry. The associated Cohen's Kappa was .45, $p < .01$, suggesting at best moderate agreement. This association is relatively low given the nature of the measures. The relatively high prevalence of participants who denied recent cocaine use but tested positive upon entry suggests that the low correlation is due to underreporting.

MARIJUANA USE

The frequencies of self-reported responses regarding marijuana use crossed with outcomes of the biological assays are provided in Table 5 (biological assay test results by self-report response) and Table 6 (self-report responses by biological assay results). Among persons who claimed recent marijuana use, the proportion testing positive and negative were approximately the same. Cohen's Kappa was .53, $p < .01$, suggesting at best moderate agreement between the two measures. Unlike our analyses of any drug use or of cocaine use, participants were far more likely to admit drug use but tested negative as they were to deny drug use but tested positive. It is plausible that club attendees see marijuana use as more benign than other drug use and were more likely to admit using marijuana. In addition, the much shorter time span for detecting THC in oral fluid increases the likelihood that smoking marijuana within the 48-hour window would go undetected in the oral fluid.

AMPHETAMINES

The frequencies of self-reported responses regarding amphetamine use crossed with outcomes of the biological assay are provided in Table 7 (biological assay test results by self-report response) and Table 8 (self-report responses by biological assay results). Few participants claimed amphetamine use, and most tested negative for the drug upon entry. Only about half of the people who tested positive for the drug claimed recent use. The Cohen's Kappa was .60, $p < .01$, suggesting at best moderate agreement between the measures. Given the nature of the measures, this correlation may be interpreted as relatively low, and due primarily to participants denying amphetamine use but testing positive upon entry.

DISCUSSION

The relationship of self-reports to the oral assays is summarized in Table 9. As was expected, participants underreported their drug use. The extent of the underreporting (no use) was greatest for cocaine (67%) and amphetamines (52%). In contrast, only 32% of the marijuana positive cases denied using the drug in the previous 48 hours, suggesting that the participants were less reticent to admit using that drug. Since all the samples providing a positive result on the screening test were confirmed by precision laboratory methods, a positive biological assay result provides strong evidence that the participant actually used the substance. Thus, the evidence is clear—a substantial proportion of drug users will deny use, even when assured of anonymity. Further, this tendency varies substantially across drug types. One possibility is that variation of veracity of self-report across drug types is based on the user's perception of the danger presented by the substance or the extent to which they perceived its use to be widespread among their peers.

The interpretation of the smaller number of respondents with negative assays who reported use of a drug in the last 48 hours is conceptually more complex. There are several possible explanations. First, participants may have believed that they consumed a drug when they were given or had purchased a placebo, or they may have been dishonest with the interviewer. Alternatively, it is possible that they consumed the drug early enough in the 48-hour period that was eliminated from the body and our assay system was not sufficiently sensitive to detect the remaining substance. The data in Table 9 suggest the latter possibility. There were extremely few cases where self-reported cocaine and amphetamine consumption was not confirmed by the biological assays. Conversely, 8% of the respondents with negative assays reported using marijuana. Since THC can be eliminated in a rather short time, it is likely that this small number of reported users with negative assays eliminated the drug from their systems before arriving at our survey site.

Although a participation rate of 56% is low in absolute standards, it is not untypical for field research. However, most nonparticipants were "soft" refusals, that is, they did not even stop to listen to a description of the research activity (as opposed to those who listened to the recruitment spiel and then decided not to take part). Although we collected some data (e.g., group size) on nonparticipants via observations, we cannot determine whether participants and refusals differed in terms of drug use. Nevertheless, given that the focus of the research is to understand the accuracy of self-reported drug use, the results are useful even if they generalize only to the population of EMDE attendees likely to participate in field surveys.

Another limitation of this study was that we had only a single 48-hour period for collecting the drug use/no-use self-report variable, but the array of drugs we examined varied considerably in the timeframe at which they could be detected in oral fluids. This means that the biological assay was more likely to predict some drugs more than others. Consequently, we needed to interpret validity of self-reports differently for each drug. Based on our results, cocaine and amphetamine appear to be substantially underreported and are unlikely to be reported where actual use has not occurred. In contrast, marijuana is more likely to be reported but less likely to be detected because it remains in the body for a relatively short time.

Another limitation of the study was our sample size. Under many circumstances, 362 cases would be sufficient to detect even modest effect sizes; however, because our analyses needed to accommodate our sampling structure (individual participants were nested within peer-groups), we lost some statistical power through the reduced degrees of freedom. Although we had sufficient statistical power to detect a number of interesting relationships, we failed to detect any statistically significant effects involving participant demographics. The presence of statistically significant demographic effects may have suggested additional analyses of potential moderators for predicting drug use.

This and other studies (Furr-Holden et al. 2006; Miller et al. 2005) using the portal survey technique demonstrate that collecting oral assays of actual substance use in field settings outside the laboratory can be practically undertaken and can provide valuable data not previously available. Further, these data are a more complete and valid test of substance use than those based upon self-reports alone. Although the substantial underreporting suggests that self-reports are not adequate for providing valid epidemiological estimates of drug use, these results do suggest that self-report surveys may be useful in gauging the relative extent of drug use risk at such venues and comparing changes over time in self-reported use. Self-reports of substance use during the past 48 hours measured at the entrance to events similar to the EMDEs will identify approximately 60% of those who have been using drugs. However, self-reported histories of drug use over the past 6 months combined with reports of drug use in the past 48 hours were markedly more predictive of actual drug use.

A survey of locations hosting EMDE-type events should produce enough variance across sites to provide an indication of those venues that merit attention in an intervention program. Better identification of high-risk sites can be achieved through portal surveys where oral fluid samples are collected and analyzed; however, the fluid collection device and, particularly, the biological analysis expenses will probably be too high for routine use to identify high-risk sites. A combination of relatively inexpensive self-report surveys and structured observational surveys can provide a fairly reliable means of identifying high-risk sites.

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REFERENCES

Arria A, Yacoubian G, Fost E, Wish E. Ecstasy use among club rave attendees. Archives of Pediatrics and Adolescent Medicine 2002;156:295–296. [PubMed: 11876678]

Furr-Holden CDM, Voas Robert B. Kelley-Baker Tara, Miller Brenda. Drug and alcohol-impaired driving among electronic music dance event attendees. Drug and Alcohol Dependence 2006;85:83–86. [PubMed: 16675160]

Laloup M, Tilman G, Maes V, De Boeck G, Wallemacq P, Ramaekers J, Samyn N. Validation of an ELISA-based screening assay for the detection of amphetamine, MDMA and MDA in blood and oral fluid. Forensic Science International 2005;153:29–37. [PubMed: 15922530]

Landis JR, Koch G. The measurement of observer agreement for categorical data. Biometrics 1977;33:159–174. [PubMed: 843571]

Lange JE, Johnson MB, Reed MB. Drivers within natural drinking groups: An exploration of role selection, motivation, and group influence on driver sobriety. American Journal of Drug and Alcohol Abuse 2006;32:261–274. [PubMed: 16595327]

Lange JE, Reed MB, Johnson MB, Voas RB. The efficacy of experimental interventions designed to reduce drinking among designated drivers. Journal of Studies on Alcohol 2006;67:261–268. [PubMed: 16562408]

Leinwand D. Cities crack down on raves; Rising popularity prompts backlash over drug use. USA Today. 2002 November 13; A.01.

Miller BA, Furr-Holden CDM, Voas RB, Bright K. Emerging adults' substance use and risky behaviors in club settings. Journal of Drug Issues 2005;35:357–378.

Quintela O, Cruz A, de Castro A, Concheiro M, López-Rivadulla M. Liquid chromatography-electrospray ionisation mass spectrometry for the determination of nine selected benzodiazepines in human plasma and oral fluid. Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences 2005;825:63–71.

Samyn N, van Haeren C. On-site testing of saliva and sweat with Drugwipe, and determination of concentrations of drugs of abuse in saliva, plasma and urine of suspected users. International Journal of Legal Medicine 2000;113:150–154. [PubMed: 10876986]

Samyn N, Verstraete A, van Haeren C, Kintz P. Analysis of drugs of abuse in saliva. Forensic Science Review 1999;11:2–19.

Schepers RJ, Oyler JM, Joseph RE Jr, Cone EJ, Moolchan ET, Huestis MA. Methamphetamine and amphetamine pharmacokinetics in oral fluid and plasma after controlled oral methamphetamine administration to human volunteers. Clinical Chemistry 2003;49:121–132. [PubMed: 12507968]

Toennes SW, Kauert GF, Steinmeyer S, Moeller MR. Driving under the influence of drugs - evaluation of analytical data of drugs in oral fluid, serum and urine, and correlation with impairment symptoms. Forensic Science International 2005;152:149–155. [PubMed: 15978340]

Verstraete AG. Detection times of drugs of abuse in blood, urine, and oral fluid. Therapeutic Drug Monitoring 2004;26:200–205. [PubMed: 15228165]

Voas RB, Furr-Holden CDM, Lauer E, Bright C, Johnson MB, Miller B. Portal surveys of timeout drinking locations: A tool for studying binge drinking and AOD use. Evaluation Review 2006;30:44–65. [PubMed: 16394186]

Wylie FM, Torrance H, Anderson RA, Oliver JS. Drugs in oral fluid Part I. Validation of an analytical procedure for licit and illicit drugs in oral fluid. Forensic Science International 2005;150:191–198. [PubMed: 15944059]

Table 1

Cross-Tabulation of Responses to the 48-Hour Drug Use Question and the Results of Biological Assay for Any Drug Use

	Negative Test Result	Positive Test Result	Total
No 48-hour drug use	*255* (.876)	*036* (.124)	***291*** **(1.00)**
Yes 48-hour drug use	*018* (.257)	*052* (.743)	***070*** **(1.00)**

Table 2

Cross-Tabulation of Results of Biological Assay and the Responses to the 48-Hour Drug Use Question for Any Drug Use

	Negative Test Result	**Positive Test Result**
No 48-hour drug use	*255* (.934)	*036* (.409)
Yes 48-hour drug use	*018* (.066)	*052* (.591)
Total	***273* (1.00)**	***088* (1.00)**

Table 3

Cross-Tabulation of Responses to the 48-Hour Drug Use Question and the Results of Biological Assay for Cocaine Use

	Negative Test Result	Positive Test Result	Total
No 48-hour drug use	*313* (.910)	*031* (.090)	***344*** **(1.00)**
Yes 48-hour drug use	*001* (.062)	*015* (.938)	***016*** **(1.00)**

Table 4

Cross-Tabulation of Results of Biological Assay and the Responses to the 48-Hour Drug Use Question for Cocaine Use

	Negative Test Result	**Positive Test Result**
No 48-hour drug use	*313* (.997)	*031* (.674)
Yes 48-hour drug use	*001* (.003)	*015* (.326)
Total	***314* (1.00)**	***046* (1.00)**

Table 5

Cross-Tabulation of Responses to the 48-Hour Drug Use Question and the Results of Biological Assay for Marijuana Use

	Negative Test Result	Positive Test Result	Total
No 48-hour drug use	*285* (.960)	*012* (.040)	***344*** **(1.00)**
Yes 48-hour drug use	*024* (.480)	*026* (.520)	***050*** **(1.00)**

Table 6

Cross-Tabulation of Results of Biological Assay and the Responses to the 48-Hour Drug Use Question for Marijuana Use

	Negative Test Result	**Positive Test Result**
No 48-hour drug use	*285* (.922)	*012* (.316)
Yes 48-hour drug use	*024* (.078)	*026* (.684)
Total	***314* (1.00)**	***046* (1.00)**

Table 7

Cross-Tabulation of Responses to the 48-Hour Amphetamine Use Question and the Results of Biological Assay for Amphetamine Use

	Negative Test Result	Positive Test Result	Total
No 48-hour drug use	*328* (.962)	*013* (.038)	***341*** **(1.00)**
Yes 48-hour drug use	*002* (.143)	*012* (.857)	***014*** **(1.00)**

Table 8

Cross-Tabulation of Results of Biological Assay and the Responses to the 48-Hour Drug Use Question for Amphetamine Use

	Negative Test Result	**Positive Test Result**
No 48-hour drug use	*328* (.994)	*013* (.520)
Yes 48-hour drug use	*002* (.006)	*012* (.480)
Total	***330* (1.00)**	***025* (1.00)**

Table 9

Percentages of Respondents with Positive Assays Reporting Drug Use and Nonuse

		Negative Test Result	Positive Test Result
Cocaine	Used	<1%	33%
	Not Used	99%	67%
THC	Used	8%	68%
	Not Used	92%	32%
Amphetamine	Used	<1%	52%
	Not used	99%	45%