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Various methods of assessing drug use, abuse and dependence are available, including urinalysis, informants, prescription records, hospital admissions, and arrest reports. None, however, is potentially as useful and accurate as an individual's self-report. Two major obstacles have been identified that may limit the accuracy of self-reports: (1) inability to identify drugs that have been taken, and (2) reluctance to admit a socially undesirable, deviant, or often illegal act.

Two key determinants of a respondent's ability to identify products have been suggested: recognition and recall [24]. Recognition can be defined as knowledge of the name or image of a product that has been used. Recall is the ability to report that the product has been taken at some time in the past. Despite the conceptual distinction, operationally it is difficult to isolate any one factor as the main barrier to accurate identification.

The purpose of this paper is to enumerate and discuss a number of different techniques that have been used to (1) facilitate the recognition of drugs, (2) assist the recall that a particular drug was used, and (3) encourage honest reports of use. Suggestions are presented for methods or combinations of methods to produce the most accurate reports of both past and current use.

RECOGNITION

Two methods of facilitating recognition are: (1) presentation of products in meaningful categories, and (2) use of cues that help a respondent identify products used. Prudent use of both these techniques should increase the validity of self-reports.

Manner of Presentation

Similar products are usually grouped into general categories though few studies use common categories. This is especially true for stimulant and depressant prescription medicines [3,13]. Two distinct ways of presenting products are used. One is based on the pharmacological effect of the product and the other on the way the product can be obtained, by prescription, over-the-counter, or illegally.

There is even a greater problem in categorizing substances that are generally used illegally. For example, in some questionnaires LSD is a separate item; in others, LSD is included under the broader heading of hallucinogens or psychedelics [3]. Most products labeled as hallucinogens such as THC or mescaline actually contain LSD, phencyclidine, or MDA [27]. Thus, the use of separate categories for LSD and other hallucinogens could actually produce an underestimate of the use of LSD. Despite the advantage of comparability and simplicity in using a series of probes for a few general categories rather than each product used, specificity is sacrificed. In most studies where estimation of patterns of use is only one of many areas of interest, a series of probes for every pill that had ever been used would take far too long.

One study [2] combined both procedures. Respondents were asked which if any pills within a general class of products were used. The followup questions referred to the drug or pill that was used most often or most recently. One of the major aims for future research would be the development of an efficient way to obtain meaningful responses for both individual products and groupings of similar drugs. A more refined procedure might be established where the respondent answers questions about a general class of products and then indicates the specific product or products that he/she had in mind when answering the questions [18].

Aids to Recognition

There are at least six cues that may help a respondent recognize a product: functional descriptors, pharmacological categories, generic names, tradenames, streetnames, and pictures. Some workable combination of these cues can facilitate recognition. Too few aids may not provide enough information to improve recognition. Too many may confuse the respondent, producing higher rates of false positive reports (as when fictitious drugs are listed) or an underreporting.

Functional descriptors indicate reasons for use or effects of use. Functional descriptors should indicate more than the common "upper" or "downer" terms often used [14]. Descriptors such as "to calm down, to relax or to reduce tension" have been used in national studies of psychotropic drug use [28,31]. Functional descriptors may produce more valid reports of general use patterns. However, if a more precise discrimination among products with similar functions (such as sedatives, tranquilizers and barbiturates) is desired, these general cues may confuse respondents. One can first ask a ques-tion about a general functional descriptor grouping and then proceed to questions about specific products within that general group. An alternative would be to ask about the use of specific categories of products followed by a question about the use of any other products with similar functions.

Products have been placed in <u>pharmacological</u> <u>categories</u> in any number of ways, often creating confusion. Classification systems with a number of levels have been suggested [8,31]. Data should be collected in a way that permits translation of the results back into generally accepted pharmacological classification systems. Within a particular category, pictures, functional descriptors or tradenames could be used as cues and examples. The examples should be products that are or were most prevalent in the time period covered by the interview [22,31,34].

<u>Generic names</u> are rarely if ever used in drug use questionnaires or interviews. New guidelines on substitutibility of drugs [39], however, may make generic names more important cues than individual tradenames.

One of the most common cues used by researchers, particularly for prescription products is the <u>tradename</u> of particular pills [2,28,31]. Ninety percent of the pills respondents indicated using in one study were reported by name [24]. The use of tradenames, given the number, variety, and titles [28] does present a number of problems. Physicians and druggists may not tell patients the tradenames of products prescribed or sold [28,30]. Over six pages of products with tradenames so similar they are easily confused by even druggists, nurses and physicians were listed in one report [38].

The problem with the use of <u>street termi-</u><u>nology</u> to label illegal substances or products obtained illicitly is even more complex. The Bureau of Narcotics and Dangerous Drugs has listed over 40 terms for marihuana, at least 20 for cocaine and up to 30 for amphetamines. Names may differ across time, regions of the country or within communities in the same metropolitan area. Use of such "vernacular" is often viewed as an "attempt to cozy up to the students" and the terminology for different substances constantly changes [25]. It was concluded that the use of street terms, particularly inappropriate ones, may damage the rapport in the interview.

Another problem with the use of <u>street</u> <u>terminology</u> is that the report of the use of a product does not guarantee that the product was accurately labeled by the distributor [43]. A third of street drug samples analyzed in one study [26], contained substances entirely different from what was advertised. Virtually all street drugs have been found to be falsely labeled or adulterated at some time, including: barbiturates [10], heroin [35], cocaine [36], THC [6,16,27,36] and LSD [27].

The use of visual aids is one technique that has been shown to increase the validity of reports of drug use [30]. Only five percent of the respondents who used drugs in one national sample [28] were not able to identify the name of at least one product they had used with the aid of a color photo chart of products. However for street drugs, different capsules, bootleg chemists, and devious modes of merchandising make meaningful recognition of illegal substances difficult [43]. A forward to a pamphlet showing pictures of the "300 most abused drugs" cautions that "most of the commonly abused drugs are nondescript and therefore extremely hard to identify visually" [4]. The researcher is faced with a problem of how many pictures and which pictures to use as cues. Too many pictures could produce

confusion that reduces the validity which might be obtained without pictures. Two examples used in national studies are three cards with approximately eight pictures per card [1] and a chart with over 120 different drugs [31]. Neither method appeared to produce dramatically different results.

RECALL

One study which directly analyzed effects of different factors found that the most important influence on recall was the currency of use [30]. Respondents who had filled prescriptions in the year prior to the interview gave reports of 20 percent greater validity than respondents who last filled prescriptions over a year prior to the interview. In addition, the validity of reports of use of antibiotics in the previous year were almost 20 percent less valid than reports of psychotropic drug use. Since psychotropic drugs are generally used over a longer time and are refilled more often and in greater quantity than antibiotics, it was concluded that the difference in validity may be attributable to the recency and duration of psychotropic drug use.

In a national study of psychotropic drug use [28,31], only five percent of the respondents who used psychotropic drugs were not able to recall the specific name of a product used in the past year. The more recent the use, the more readily the specific product name was recalled.

Respondents may be able to recall using a class of products, but individual products often may be confused even when pictures are provided as cues. Seventeen percent of the respondents who filled prescriptions for stimulants reported instead the use of sedatives or tranquilizers. On the other hand only four percent of respondents filling sedative prescriptions and two percent filling tranquilizer prescriptions reported using products other than these. From the data it is difficult to determine why there was more inaccurate recall by stimulant users.

One hypothesis is that respondents could not recall which pills they had taken. In the national study [28], some respondents who reported using tranquilizers named "aspirin" or "dexedrine" as the specific tranquilizer indicating a problem in recognition. Another hypothesis is that respondents think stimulant, especially amphetamine, use is more deviant or less acceptable than depressant use, indicating a problem in reporting. In another study [15], a number of respondents indicated uncertainty about ever trying a particular kind of product. Not sure responses accounted for almost 10 percent of the answers for five prescription psychotropic products and over 20 percent of the answers for the barbiturate category.

In a comparison study [23], more reports of past and current occasional marihuana use were obtained in self-administered questionnaires than in personal interviews. Fewer reports of frequent past use of marihuana were obtained in the self-administered questionnaire. It was concluded that the interview procedure may have instigated a more complete recall of past experience.

Another technique that is usually interpreted as a test of the honesty of self-reports, reports of a fictitious drug, may represent a problem in recall. Fictitious products have been included in a number of studies [9,14] that found that very few respondents reported using these products. Followup probes in one study [19] indicated that most respondents reporting the use of fictitious products thought the false drug existed. Rather than indicating a tendency to exaggerate use, two studies [32,42] seem to show that multiple drug users may not be able to accurately recall the types of products used. They may admit the use of a product even if they have some doubt about whether they have taken the product or that the product really exists. The similarity in names of different products [38] may contribute to overreporting, especially among multiple drug users who are exposed to a variety of drugs. Thus, recall may be confounded by the ability to recognize products used.

Specific kinds of products do seem to produce problems in recall. Recent use seems to be the only factor that clearly facilitates recall. In a systematic study of these issues it should be possible to test the effects of different variables by examining the main effects and interactions of these variables on recall of past and current use of different types of products. Covariates of age, education, and sex should also be included in any design. Other factors such as admission of honesty, cooperation in the interview, or ability to comprehend the complexity of the questions should also be considered.

REPORTING

Assuming the product can be identified, a second major concern is whether a respondent will, in fact, report using the product. The possibly threatening nature of the act of reporting use may tend to inhibit completely honest reports [7]. A variety of procedures ranging from simple to complex have been used to elicit reports. However, few attempts have been made to assess the efficacy of one method compared to another. In the following sections some of the procedures typically used will be described and discussed.

Anonymity

Many studies use some procedures to keep responses completely anonymous, protecting not only the respondent but also the researcher [13]. One reviewer [3] reported that a "secret ballot" [29] produced a higher report of use than a personal interview [11] in two national surveys of college students conducted in the same year. However, no substantial differences in reports of use between identifiable and anonymous questionnaires were found in a variety of studies at different colleges [21]. In more controlled studies similar conflicting results were obtained. Clearly anonymous forms did not seem to produce more reports of use than three other types of identifiable forms [14]. In another study [23] the opposite result was found: eight percent more respondents reported using marihuana in the anonymous compared to a coded form.

Overall it appears that no conclusive evidence has been presented that anonymity produces more reports of use. It is possible that if the anonymous nature of the response is overemphasized there may be a "boomerang" effect of increased suspicion. The potential gains of anonymity seem to be outweighed by the advantages of having some way to link drug use reports to other information or to match interviews in succeeding waves of a longitudinal study [14].

Confidentiality

One element that can not be eliminated from an interview is the assurance of the confidentiality of responses. Many procedures have been employed, but no methodological studies have been reported that test the effects of the different methods of assuring confidentiality. In a national survey [1] a self-administered questionnaire was sealed in an envelope by the respondent and could be mailed by the respondent so that interviewers would have no knowledge of responses. In another study [25] materials were sent outside the country where one serial number was removed and a second number was placed on the form. It was felt that these procedures encouraged more cooperation by convincing both interviewers and respondents of the sincerity of the researchers' efforts to maintain confidentiality.

A statewide study of high school students required parental permission for participation and linked respondents to parents and peers only by self-generated code numbers [20]. These procedures resulted in a refusal rate of 14 percent in New York City and less than 50 percent matching of respondents to parents and peers.

One technique that might prove valuable in insuring protection for both the respondent and the researcher is the randomized response technique [40]. This procedure was used with some success in a study of marihuana use and attitudes toward use in a sample of Army enlistees [5]. One problem with this technique is that it is difficult to design probes and formats for followup questions. However, it may be useful for estimating prevalence of illicit drug use.

Interviews versus Self-Administered Questionnaires

The issue of confidentiality raises a critical question of how responses are recorded. At present no clear evidence of greater accuracy of either interviewer administered or self-administered procedures is available. The evidence that is available is unclear or can be interpreted in other ways.

One reviewer [3] hypothesized that despite possible differences in the samples and in response rates, the ten percent difference in reports of marihuana use and the four percent higher report of LSD use may have been due to the self-administered mail questionnaire procedure [29], compared to a personal interview [11]. A problem in selection of different samples for two response conditions confounds the interpretation of the results of another comparative study [23]. Although it was found that reports of frequent past use of marihuana were more prevalent (23 percent) in a personal interview than in anonymous (9 percent) or coded (8 percent) self-administered questionnaires, the samples for each condition differed greatly in size and reason for participation in the study.

Both personal interviews and self-administered questionnaires have been used successfully in a variety of studies. However, in the two National Commission studies [1,2], 10 percent of the respondents in national adult random probability samples could not read the self-administered form and an additional 15 percent appeared to have some trouble reading the form. Based on the results of studies on the effects of assurances of confidentiality [17,21], the number of respondents unwilling to publicly report use may be far smaller than the number who are confused or cannot read the self-administered questionnaire.

Interview Format

The design of the interview schedule could produce motivations to respond more forthrightly to drug questions. How the interview itself is introduced, the context in which the drug questions are embedded, and the order of presentation of the products could influence responses. None of these issues appears to have been empirically evaluated.

Although there are exceptions [41], few if any drug surveys deal only with drug use. Some are introduced as investigations of health [28,31], social issues [1,2,17], or life styles [25]. In validity studies [30,33], if respondents perceive any connection with past history or that records can be checked to verify their responses, they may be more likely to give valid responses.

How the transition to drug questions is made and how it relates to the stated purpose of the study could either increase a respondent's suspicion or reduce a reluctance to respond. For example, one survey [24] introduced drug questions with preliminary questions about a respondent's health problems, symptoms, and means of coping with them. Another survey [17] interspersed drug questions to check the internal consistency of responding with apparently successful results. However, in general, suddenly asking a question about drug use or interspersing drug questions in other contexts in the interview could arouse hostility and consequently lower the validity of use reports. A third issue in formatting the instrument is the order in which products are presented. Most studies start out with innocuous products such as cigarettes or alcohol, proceed to marihuana and conclude with questions on heroin or opiates. Although intuitively preferable, there is no empirical evidence that this procedure produces more valid responses. Respondents may become more and more defensive as the social undesirability of the products increases. Starting with illegal substances may catch a respondent off guard and initially produce more valid responses, but it may increase defensiveness about answering succeeding questions on the use of objectively less threatening products.

Wording

An often overlooked but critically important aspect of the methodology of constructing a questionnaire on drug use is the wording of the items designed to assess patterns of use. A variety of wordings have been employed for a variety of purposes. Different ways in which items are worded may produce different rates of response.

A very soft wording [11,12] ("Have you ever happened to try ...?") may produce more reports of experimental or one time use. Asking how often a product is used may pick up only current users [25]. In a pretest two respondents admitted "trying" cigarettes; when asked how often they "used" cigarettes, they stated emphatically that they had never "used" cigarettes [15].

A second effect on question wording may be a better estimate of the number of false negative reports of nonuse. More than one category of nonuse, such as the degree of the desire to try the product have been employed in two studies [17,37]. Analyses of such responses could also indicate respondents who may not have reported truthfully. Including a response alternative that permits a respondent to either admit uncertainty about use or evade denying use could indicate the rate of false negative responses, especially those due to problems of recognition or recall. Five percent of the answers in one pretest [15] indicated that respondents were "not sure" they had ever tried particular kinds of products.

CONCLUSIONS

In this paper, we have attempted to present a number of elements to take into account in the assessment of drug use patterns by self-report. Although a variety of approaches and techniques have been suggested, there is little definitive evidence of the impact of any one or any combination of techniques on self-reports of drug use. It is apparent that more systematic methodological studies are needed to identify the most effective ways to obtain self-reports of drug use. These studies need to consider at a minimum the characteristics of the respondent, types of drugs used, and temporal patterns of use as well as the design of the data collection instrument and the procedures for obtaining the self-reports. An attempt should also be made to compare and integrate the designs and results of the proposed studies with the designs and results of methodological studies of collecting other types of complex and sensitive information through self-reports.

REFERENCES

- [1] Abelson, H., Cohen, R., & Schrayer, D. "Public Attitudes Toward Marihuana, Part 1: Main Report." In National Commission on Marihuana and Drug Abuse, Marihuana: A Signal of Misunderstanding, Appendix, Vol. II. Washington, D.C.: U.S. Government Printing Office, 1972.
- [2] ____, and Rappeport, M. "Drug Experiences, Attitudes and Related Behavior Among Adolescents and Adults." In National Commission on Marihuana and Drug Abuse, Drug Use in America: Problem in Perspective, Appendix Vol. I. Washington, D.C.: U.S. Government Printing Office, 1973.
- [3] Berg, D.F. "The Non-Medical Use of Dangerous Drugs in the United States: A Comprehensive View." The International Journal of the Addictions, 5 (1970), 777-834.
- [4] Bludworth, E. 300 Most Abused Drugs. A Pictorial Handbook of Interest to Law Enforcement Officers and Others. Tampa, Fla.: Trend House, 1969.
- [5] Brown, G.H., and Harding, J.C. A Comparison of Methods of Studying Illicit Drug Usage. Alexandria, Va.: Human Resources Research Organization, 1973.
- [6] Brown, J.K., and Malone, M.H. "Some Street Drug Identification Programs in the United States and Representative Analytic Results." Journal of the American Pharmaceutical Association, (1974).
- [7] Cannell, C.F., and Fowler, F.J. "A Comparison of Self-Enumerative Procedures and a Personal Interview: A Validity Study." *Public Opinion Quarterly*, 27 (1963), 250-264.
- [8] Elinson, J., Haberman, P.W., Hervey, L., and Allyn, A.L. Operational Definitions of Terms of Drug Use Research. Report for SAODAP. New York: Columbia University, 1974.
- [9] Fejer, D., and Smart, R.G. Drug Use and Psychological Problems Among Adolescents in a Semi-Rural Area of Ontario: Haldimand County. Toronto: Addiction Research Foundation, 1971.
- [10] Finkle, B.S. "Ubiquitous Reds: A Local Perspective on Secobarbital Abuse." Clinical Toxicology, 4 (1971), 253-264.
- [11] Gallup Opinion Index. "Results of a Survey of College Students." Report No. 68. Princeton, N.J.: Gallup International, February 1971.
 [12] _____. "Current Views of College Students
- [12] _____. "Current Views of College Students on Politics and Drugs." Report No. 80. Princeton, N.J.: Gallup International, February 1972.
- [13] Glenn, W.A., and Richards, L.G. Recent Surveys of Nonmedical Drug Use: A Compendium of Abstracts. Rockville, Md.: National Institute on Drug Abuse, 1974.

- [14] Haberman, P.W., Josephson, E., Zanes, A., and Elinson, J. "High School Drug Behavior: A Methodological Report on Pilot Studies." In S. Einstein and S. Allen, Proceedings of the First International Conference on Student Drug Surveys. Farmingdale, N.Y.: Baywood Publishing Co., 1972.
- [15] Hubbard, R.L. A Comparison of Required Versus Voluntary Reports of Past and Current Drug Use. Unpublished Research Report. Milwaukee: The University of Wisconsin, 1975.
- [16] Janes, S.H. and Bhatt, S. "Analysis of Street Drugs: A Six Month Study of the Actual Content of Illicit Drug Preparations in a Community." Journal of Drug Education, 2 (1972), 197-210.
- [17] Johnston, L. Drugs and American Youth. Ann Arbor, Mich.: The University of Michigan, Institute for Social Research, 1973.
- [18] Johnston, L.D. "Drug Use During and After High School: Results of a National Longitudinal Study." The American Journal of Public Health Supplement, Part Two, 64 (1974), 29-37.
- [19] Josephson, E. "Trends in Adolescent Marihuana Use." In E. Josephson and E. E. Carroll, Drug Use: Epidemiological and Sociological Approaches. Washington, D.C.: Hemisphere Publishing Corp., 1974.
- [20] Kandel, D. "Interpersonal Influences on Adolescent Illegal Drug Use." In E. Josephson and E. E. Carroll, Drug Use: Epidemiological and Sociological Approaches. Washington, D.C.: Hemisphere Publishing Corp., 1974.
- [21] King, F.W. "Anonymous Versus Identifiable Questionnaires in Drug Usage Surveys." *American Psychologist*, 25 (1970), 982-985.
 [22] Levy, R., and Brown, A. "An Analysis of
- [22] Levy, R., and Brown, A. "An Analysis of Calls to a Drug Crisis Intervention Service." Journal of Psychedelic Drugs, 6 (1974), 143-152.
- [23] Luetgert, M.J., and Armstrong, A.H. "Methodological Issues in Drug Usage Surveys: Anonymity, Recency and Frequency." The International Journal of the Addictions, 8 (1973), 683-689.
- [24] Manheimer, D.I., and Mellinger, G.D. "The Psychotropic Pill Taker: Will He Talk?" Public Opinion Quarterly, 31 (1967), 436-437.
- [25] _____, Somers, R.H., and Kleman, M.T. "Technical and Ethical Considerations in Data Collection." In S. Einstein and S. Allen, Proceedings of the First International Conference on Student Drug Surveys. Farmingdale, N.Y.: Baywood Publishing Co., 1972.
- [26] Marshman, J.A., and Gibbons, R.J. "The Credibility Gap in the Illicit Drug Market." Addictions, 16 (1969), 22-25.
 [27] McGlothlin, W.H. "The Epidemiology of
- [27] McGlothlin, W.H. "The Epidemiology of Hallucinogenic Drug Use." In E. Josephson and E. E. Carroll, Drug Use: Epidemiological and Sociological Approaches. Washington, D.C.: Hemisphere Publishing Corp., 1974.

- [28] Mellinger, G.D., Balter, M.D., Parry, H.J., Manheimer, D.I., and Cisin, I.H. "An Overview of Psychotherapeutic Drug Use in the United States." In E. Josephson and E. E. Carroll, Drug Use: Epidemiological and Sociological Approaches. Washington, D.C.: Hemisphere Publishing Corp., 1974.
- Hemisphere Publishing Corp., 1974.
 [29] "New Mood on Campus." Newsweek, December 29, 1969, 42-45.
- [30] Parry, H.J., Balter, M.B., and Cisin, I.H. "Primary Levels of Underreporting Psychotropic Drug Use." Public Opinion Quarterly, 34 (1971), 582-592.
- [31] ____, Mellinger, G., and Manheimer, D. "National Patterns of Psychotherapeutic Drug Use." Archives of General Psychiatry, 28 (1973), 769-783.
- [32] Petzel, J.P., Johnson, J.E., and McKillip, J. "Response Bias in Drug Surveys." Journal of Consulting and Clinical Psychology, 40 (1973), 437-439.
- [33] Robins, L.N., Davis, D.H., and Nurco, D.N. "How Permanent Was Vietnam Drug Addiction." The American Journal of Public Health, Supplement, Part Two, 64 (1974), 38-43.
- [34] Rucker, T.D. "Drug Use: Data, Sources and Limitations." Journal of the American Medical Association, 230 (1974), 888-890.
- [35] Schnoll, S.W., Weisman, M., and Lerner, N. "Quality of Street Heroin." New England Journal of Medicine, 289 (1973), 698-699.
- [36] Smith, D.E. "Street Drug Analysis and Community Based Drug Programs." Journal of Psychedelic Drugs, 6 (1974), 153-159.

- [37] Tec, N. "Differential Involvement with Marihuana and its Sociocultural Context: A Study of Suburban Youths." The International Journal of the Addictions, 7 (1972), 655-669.
- [38] Teplitsky, B. "Drug Nomenclature--a Dilemma." Journal of Drug Issues, 4 (1974), 135-141.
- [39] Tice, L.F. "The Pharmacist and Drug Product Selection." American Journal of Pharmacy, 146 (1974), 67-69.
 [40] Warner, S.L. "Randomized Response: A
- [40] Warner, S.L. "Randomized Response: A Survey Technique for Eliminating Evasive Answer Bias." Journal of the American Statistical Association, 60 (1965), 63-69.
- [41] Whitehead, P.C. Drug Use Among Adolescent Students in Halifax. Province of Nova Scotia: Youth Agency, 1969.
- [42] _____, and Brook, R. Social and Drug Using Backgrounds of Drug Users in Treatment: Some Implications for Treatment. London, Ontario: Addiction Research Foundation, 1971.
- [43] ____, and Smart, R.G. "Validity and Reliability of Self-Reported Drug Use." In S. Einstein and S. Allen, Proceedings of the First International Conference on Student Drug Surveys. Farmingdale, N.Y.: Baywood Publishing Co., 1972.