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Short communication

The utility of collateral informants in substance use research involving college students[☆]

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Abstract

Collateral informants have been routinely included in substance abuse treatment research to corroborate subject self-reported alcohol and other drug use. However, only a few studies to date have examined subject–collateral correspondence with respect to non-clinical populations (e.g., college students). The purpose of the present study was to examine the associations between college students self-reported substance use and corresponding collateral (i.e., friends') reports. A total of 100 subject–collateral pairs were recruited from psychology courses at a large public university located in the Southeastern, United States. Subjects and collaterals provided information specific to their own, as well as their friend's, recent (i.e., last 90-days) substance use. Study data yielded moderate to good, statistically significant, correlations between subject–friend pairs for each type of substance use. Discrepancy analyses revealed that the majority of subjects reported greater substance use relative to their collateral reports. This pattern of response (i.e., subject reporting greater use) is consistent with the extant literature. In addition, the friend's personal substance use appeared to influence his/her report of the subject's alcohol and other drug use. It appears that college student self-reports regarding alcohol and other drug use are reasonably accurate.

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1. Introduction

To date, there have been only a few studies that have examined correspondence between subject and collateral estimates of subject drinking/drug use among college students (Borsari & Carey, 2005; Laforge, Borsari, & Baer, 2005; Marlatt et al., 1998; Stacy, Widaman, Hays, & DiMatteo, 1985). Each of these studies demonstrated moderate to good, statistically significant, correlations between subject and collateral reports for specific alcohol use variables. Laforge et al. (2005) and Baer et al. (2001) examined specific contextual variables associated with agreement scores between student self-reports and collateral estimates and found that collaterals who reported a greater frequency of drinking with their subject counterpart, higher levels of confidence in their reports of the subject's use, and a closer relationship with the subject (e.g., boyfriend/girlfriend) provided estimates that were more consistent with the subject's self-reported alcohol use.

Substance use research involving college students typically does not include collateral informants. At this time, little is known about subject–collateral correspondence specific to drug use other than alcohol. The purpose of the present study was three-fold: 1) to examine the associations between college student self-reported substance use and corresponding friends' reports; 2) to evaluate the utility of friends as a collateral source; and 3) to assess the extent to which the collateral's own self-reported substance use influenced his/her estimate of the subject's use.

2. Method

2.1. Study population demographics

Subjects were volunteer psychology students ($N=200$): 153 (76.5%) females; mean age 18.8 ($SD=1.97$); predominately white (94%); and freshman (63%). In addition, subjects and friends reported knowing each other, on average, for a little more than two years (i.e., 27.1 months, $SD=38.6$).

2.2. Study procedures

Subjects were recruited via flyers posted in the psychology department, indicating that interested individuals bring a friend (a same-sex friend when available) with them to fill out questionnaires regarding attitudes towards alcohol and other drug use. All subjects were informed that the study involved an anonymous survey requiring them to answer questions about their personal substance use and that of their friend. Each dyad was assessed at the same time in a large room located in the psychology department. The two friends, however, were separated and monitored to prevent them from communicating with one another during the session.

2.3. Measures

2.3.1. Quantity/frequency index (QFI) measure

Participant alcohol and other drug use data were collected via a modified quantity frequency index (QFI, Cahalan & Cisin, 1968). Respondents were asked to estimate their frequency of drinking hard liquor, wine, and beer during the past three months using a 7-point Likert type scale (1 = never; 2 = less than a month; 3 = 1–3 days/month; 4 = 1–2 days/wk; 5 = 3–4 days/wk; 6 = 5–6 days/wk; 7 = everyday). Participants then estimated,

the quantity of hard liquor (1=never; 7=4 or more pints), wine (1=never; 7=5 fifths or more), and beer (1=never; 7=16 or more 12 oz cans/bottles) they consumed per drinking occasion as well as the total number of drinking days within the same three-month period. With respect to collecting drug use information, frequency of specific types of drug use, during the prior 3-month period, were collected for the following substances: cocaine, heroin, marijuana, hashish, opiates, nicotine, hallucinogens, amphetamines, barbiturates, inhalants, and benzodiazepines. Responses were coded on a 7-point Likert scale (0=never; 1=1 to 2 times in last three months; 2=once per month; 3=once every two weeks; 4=once per week; 5=2 to 3 times a week; 6=everyday). Subjects assessed their own alcohol and other drug use prior to estimating their friend's substance use.

2.3.2. *Alcohol and drug use indices*

A total of nine substance use indices were created based on the combination of the three data sources (i.e., subject self-report, friend self-report, and friend's report of the subject) and the three measures of substance use (i.e., frequency of alcohol use, quantity of alcohol use, and frequency of drug use). Each substance use index was created by summing select response items from the QFI questionnaire. More specifically, the frequency of alcohol use indices (i.e., three indices based on the subjects' self-report, friends' self-report, and friends' report of subject) were created by summing the frequency of drinking beer, wine and liquor items. Similarly, each quantity of alcohol use index (i.e., subject self-report, friend self-report, and friend report of subject) was created by summing items specific to the amounts of beer, wine and liquor consumed. The three frequency of drug use indices were formed by summing response items specific to the use of the following drugs: cocaine, heroin, marijuana, hashish, opiates, hallucinogens, amphetamines, barbiturates, inhalants, tranquilizers and benzodiazepines, within each data source. The alcohol use indices ranged from 3 to 21, and the drug use indices ranged from 0 to 66. Internal consistency reliability for each index was estimated using Cronbach's coefficient alpha, which varied across indices from .70 to .77.

2.3.3. *Discrepancy groups*

Three distinct discrepancy group variables were created based on differences between the subject's self-report and friend's report of the subject's frequency of alcohol use, quantity of alcohol use, and frequency of drug use indices. Each discrepancy group variable consisted of two levels (i.e., subject–collateral reports were consistent/subject reported greater use, or the collateral reported that the subject engaged in more substance use than s/he reported).

2.4. *Data analytic plan*

Prior to conducting any statistical analyses, the three drug use indices (i.e., subject's self-reported drug use, friend's self-reported drug use, and the friend's report of the subject's drug use) were logarithmically transformed to improve each variable's distributional characteristics. Additionally, the following variables required square root transformations to ensure that the data were approximately normal: the subject and friend's report of the subject's cocaine, amphetamine and hallucinogen use. Correlational analyses were performed to assess the degree of association between the subject and friend reports of the subjects' substance use. Additionally, subject–friend discrepancy score variables, specific to each type of substance use, were calculated by subtracting the friend's reported value for each substance used by the subject from the subject's reported value. Thus, a positive difference score reflected greater use reported by the subject.

Table 1
Frequency of alcohol and other drug use ($N=200$)

	Never % (<i>n</i>)	<once a month % (<i>n</i>)	1 to 3 times a month % (<i>n</i>)	1 to 4 times a week % (<i>n</i>)	Almost daily % (<i>n</i>)
Beer	17.0 (34)	8.0 (16)	19.5 (39)	47.0 (94)	6.0 (11)
Liquor	16.0 (32)	18.5 (37)	37.5 (75)	26.0 (52)	0.5 (1)
Wine	46.0 (92)	25.5 (51)	21.0 (42)	6.0 (12)	0.0 (0)
Marijuana	59.5 (119)	11.0 (22)	11.5 (23)	9.5 (19)	5.5 (11)
Nicotine	49.5 (99)	5.0 (10)	7.0 (14)	9.0 (18)	26.5 (53)
Caffeine	10.5 (21)	2.0 (4)	4.0 (8)	23.5 (47)	57.0 (114)
Cocaine	91.0 (182)	2.5 (5)	2.5 (5)	1.0 (2)	0.0 (0)
Hashish	94.0 (188)	3.0 (6)	0.0 (0)	0.0 (0)	0.0 (0)
Heroin	94.5 (189)	1.0 (2)	1.0 (2)	0.5 (1)	0.0 (0)
Other opiates	93.5 (187)	3.0 (6)	0.5 (1)	0.0 (0)	0.0 (0)
benzodiazepines	94.0 (188)	3.0 (6)	0.0 (0)	0.0 (0)	0.0 (0)
Amphetamines	90.0 (180)	5.0 (10)	0.0 (0)	1.5 (3)	0.5 (1)
Hallucinogens	85.5 (171)	8.0 (16)	3.0 (6)	0.5 (1)	0.0 (0)
Inhalants	93.5 (187)	1.5 (3)	0.0 (0)	1.0 (2)	1.0 (2)
Barbiturates	92.5 (185)	2.0 (4)	1.0 (2)	1.0 (2)	0.5 (1)

Note: Due to missing data, prevalence estimates across each category may not equal 100%.

To examine the influence of the friend's own self-reported substance use on his/her reports of the subjects' substance use, three separate t-tests were conducted, each using one of the three discrepancy group variables as an independent variable (i.e., frequency of alcohol use, quantity of alcohol use, and frequency of drug use). The corresponding friend's own self-reported substance use indices (i.e., frequency of alcohol use index, quantity of alcohol use index, frequency of drug use index) were treated as dependent variables in these analyses.

3. Results

3.1. Subject substance use characteristics

In the 3-month period before the questionnaires were administered, 88.3% of the subjects reported they had consumed alcohol on at least one occasion. During this 90-day period, participants reported drinking, on average, 21.3 days ($SD=19.8$). Detailed information regarding the current study sample's alcohol and other drug use characteristics are presented in Table 1.

3.2. Subject–friend correlations regarding subject substance use

Initial data analyses focused on the associations between the subject and friend's estimates of the subject's substance use. Given the reported low frequency of specific forms of drug use (e.g., heroin), correlations pertaining to subject and friend estimates of subject drug use were limited to nicotine, marijuana, hallucinogens, amphetamines, and cocaine as well as frequency of overall drug use. Due to the inherent difficulties associated with measuring the amount (i.e., quantity) of illicit substance use (e.g., lack of control regarding drug purity of illicit substances such as marijuana), drug measures were limited to

Table 2

Subject–collateral correspondence regarding subject and collateral reports of subject's alcohol and other drug use

Variable name	Subject \geq friend ¹	Friend \geq subject = 1 ²	Friend > subject = 2 ³	Subject–collateral correlations ⁴
	% (N)	% (N)	% (N)	r
Frequency of liquor consumption	77.0 (151)	18.4 (36)	4.6 (9)	.65
Quantity of liquor consumption	76.0 (148)	17.4 (34)	6.7 (13)	.52
Frequency of beer consumption	71.6 (136)	21.1 (40)	7.4 (14)	.65
Quantity of beer consumption	74.0 (145)	21.4 (42)	4.6 (9)	.69
Frequency of wine consumption	79.6 (126)	13.8 (27)	7.6 (13)	.40
Quantity of wine consumption	76.5 (153)	13.8 (27)	8.2 (16)	.30
Frequency of nicotine use	86.0 (166)	8.3 (16)	5.7 (11)	.83
Frequency of marijuana use	87.6 (169)	6.7 (13)	5.7 (11)	.65
Frequency of cocaine use	97.9 (189)	1.6 (3)	0.5 (1)	.74
Frequency of hashish use	99.0 (191)	1.0 (2)	0.0 (0)	–
Frequency of heroin use	99.4 (192)	0.6 (1)	0.0 (0)	–
Frequency of other opiate use	98.5 (190)	1.0 (1)	0.5 (1)	–
Frequency of benzodiazepine use	99.0 (191)	0.5 (1)	0.5 (1)	–
Frequency of amphetamine use	97.8 (196)	0.5 (1)	1.7 (3)	.35
Frequency of hallucinogen use	95.4 (184)	3.1 (6)	1.7 (3)	.54
Frequency of inhalant use	95.3 (184)	1.0 (2)	3.6 (7)	–
Frequency of barbiturate use	98.4 (190)	0.0 (0)	1.5 (3)	–

Note: ¹Subject reports greater or equivalent use than the friend; ²Friend reports slightly greater use than the subject (i.e., by only one category); ³Friend reports substantially greater use (i.e., by at least two categories) than the subject; ⁴Correlations between subject and collateral reports of subject alcohol and other drug use. Some correlations were not directly calculated given the low frequency of use for certain drug use categories.

frequency of use. Table 2 presents correlations between subject and collateral reports of the subject's alcohol and other drug use.

3.3. Subject–friend discrepancy analyses

As shown in Table 2, across each substance use category, subjects tended to report the same or more substance use than that reported by their respective friends. The degree of subject–collateral agreement, across substances, ranged from 71.6% to 99.4%. In addition, when friends reported that the subject used more alcohol/drugs than the subject self-reported, the two reports differed by only 1 category (i.e., minimal difference) in up to 21.4% of the cases, which most likely reflects measurement error. Although there were subjects who reported less substance use than that reported by their friend, substantial differences (i.e., a difference of two or more alcohol/drug use categories) occurred, across each drug type, in a rather limited number of cases (i.e., ranging from 0.0% to 7.6%).

3.3.1. Friends' reports of the subject substance use affected by personal use

The last set of analyses examined the extent to which the friend's own self-reported substance use influenced his/her report of the subject's use. The majority of subjects reported equivalent or greater substance use relative to the reports provided by their collateral counterparts. Specifically, in 67% ($n=133$) of the cases the subject reported equivalent or greater frequency and quantity of alcohol use.

Table 3
Discrepancy group descriptive statistics (means, standard deviations) and *t*-test results

Dependent variables	Discrepant group results			<i>t</i> -test values
	Subject reports equivalent or greater substance use than the friend reported s/he used	Friend reports the subject engaged in more substance use than the subject reported		
	Mean (SD) n	Mean (SD) n		
Friend's self-reported frequency of alcohol use index	7.81 (2.83) 133	8.65 (2.79) 57		2.13*
Friend's self-reported quantity of alcohol use index	7.43 (2.71) 133	9.06 (2.84) 62		3.87**
Friend's self-reported frequency of drug use index	1.47 (2.87) 160	4.82 (6.84) 33		4.55**

Note: * $p < .05$; ** $p < .01$.

With respect to other drug use, 80% ($n = 160$) of the subjects reported greater use than that provided by their friend.

When examining the extent to which the friend's own substance use influenced his/her report of the subject's substance use behaviors, it was shown that the greater the friend's personal substance use, the more likely s/he was to report that the subject engaged in more substance use. Table 3 presents more detailed information regarding the subject–friend discrepancy group analyses.

4. Discussion

Relatively few studies have examined the degree of correspondence between subject and collateral reports of subject substance use within samples of college students. The few studies that have been done with college students typically focused on alcohol use. The present study extended the existing research by examining subject–collateral correspondence with respect to other types of substance use. Study results showed moderate to good, statistically significant correlations between subject–friend reports of subject tobacco, marijuana, cocaine, amphetamine, and hallucinogen use.

The majority of subjects reported equal or greater substance use than that reported for them by their friends. In approximately 92% of the cases, the subject reported either equivalent/greater substance use than that reported by his/her friend or the subject's self-reported substance use differed (i.e., subject reported less use) from his/her friend's report by a single use category, which most likely reflects measurement error and not a deliberate attempt to distort. In a relatively small proportion of cases (up to 7.6%), the friend reported substantially greater subject substance use than the subject self-reported.

It appears that collateral substance use influences their reports of the subject's substance use. For example, when friends reported that the subject engaged in more substance use than the subject self-reported, the friend's self-reported substance use was at the upper end of the friends' personal substance use frequency distribution. Given that personal substance use may affect one's report of another person's substance use in an upwardly biased manner, it would appear that studies involving collateral reports would benefit from the collection of collateral substance use information. Such data collection, however, would contribute to

increased study costs, and does not appear warranted given the quality of student self-report data and the lack of unique information provided by the collateral.

Given that a convenience sample was used in this study, the generalizability of the findings may be questioned. The majority (i.e., up to 70% of new admissions) of undergraduate students at this university, however, enroll in introductory psychology courses to fulfill degree requirements, as is typical in many universities, thereby reducing this concern. Subjects in this study may have provided more accurate substance use information because they knew that their responses were going to be verified. Subject–collateral correspondence regarding alcohol use in this study was comparable to that found in previous research involving college students, which suggests that college students provide reasonably accurate data.

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