Classifying Risky-Drinking College Students: Another Look at the Two-Week Drinker-Type Categorization*

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ABSTRACT. Objective: The present study examined the effectiveness of the 2-week period currently used in the categorization of heavy episodic drinking among college students. Two-week drinker-type labels included the following: nonbinge drinker, binge drinker, and frequent binge drinker. **Method:** Three samples of college student drinkers (104 volunteers, 283 adjudicated students, and 238 freshmen male students) completed the 3-month Timeline Followback assessment of drinking. Drinking behavior during the last 2 weeks of the month before the study was compared with drinking behavior during the first 2 weeks of the same month to compare behavior and resulting labels during both 2-week periods. **Results:** Inconsistencies existed in drinker-type labels during the first 2 weeks of the month and the last 2 weeks of the month for all three samples. Between 40% and 50% of participants in the three samples were classified as a different drinker type across the month. Nonbinge drinkers experienced a wide range of alcohol-related problems, and much variation existed among the frequent-binge-drinker label. **Conclusions:** The results suggest that the current definition needs to be modified to accurately identify risky-drinking college students. Expanding the assessment window past 2 weeks of behavior, as well as developing different classification schemes, might categorize risky drinkers more accurately. (*J. Stud. Alcohol Drugs* **68:** 86-90, 2007)

HEAVY EPISODIC DRINKING, or binge drinking, defined by Wechsler and colleagues (1994) as the consumption of five or more drinks in one sitting for men and four or more drinks in one sitting for women, has sparked attention among researchers. Despite widespread public exposure after the release of the results of the College Alcohol Study (CAS; Wechsler et al., 1994), many have presented arguments against the term "binge drinking," arguing that "binge" inaccurately represents the behavior of college students (Lederman et al., 2000) and refers to a prolonged period of drinking—for example, "going on a 3-day binge" (Milgram and Anderson, 2000). Additionally, others report that students who consume five/four drinks may never actually reach dangerous blood alcohol concentration (BAC) levels (Beirness et al., 2004; Lange and Voas, 2001; Perkins et al., 2001).

Despite the arguments against the term "binge drinking," researchers in the field of college student drinking have attempted to categorize college student drinkers based on the number of drinking occasions in the past 2 weeks that they consumed five/four or more drinks in one sitting

(Wechsler and Austin, 1998; Wechsler and Nelson, 2001; Wechsler et al., 1994, 2000). Based on this time period and using the binge-drinking terminology, four categories of drinker type have been defined as follows: nondrinker (student who has not consumed alcohol in the past year), nonbinge drinker (student who consumed alcohol in the past year but did not consume five/four drinks or more in one sitting during the past 2 weeks), binge drinker (student who has consumed five/four drinks in one sitting one or two times in the past 2 weeks), and frequent binge drinker (student who has consumed five/four drinks in one sitting three or more times in the past 2 weeks). Although many have presented arguments against the term "binge drinking," there is no research to date assessing or justifying the use of this 2-week period.

One potential problem with a 2-week criterion is that heavy episodic drinking behavior may vary greatly from week to week and a 2-week period may not be sufficient to determine normative drinking behavior. Nonetheless, drinker type may be used to determine treatment outcomes of participants (i.e., used to assess whether the heaviest drinkers decreased their drinking behavior postintervention) but may not accurately reflect the necessary action of the treatment. Finally, the 2-week drinker-type definition is sometimes used to determine inclusion in alcohol interventions (e.g., Turrisi et al., 2001; Werch et al., 2000), and although students may need an intervention, they may not receive it if they do not meet the necessary drinker-type criteria within the last 2 weeks.

The current study seeks to determine the effectiveness of the 2-week drinker-type definition. By collecting an entire month of drinking event data for each participant, we compare the drinking behavior and resulting drinker-type category during the last 2 weeks of 1 month of behavior (the current definition) with the drinking behavior and resulting drinker-type category during the first 2 weeks of the month. We hypothesize that there will be inconsistencies in drinker-type categories across 1 month of drinking behavior, thereby suggesting that a 2-week definition of drinker type is too brief a period to accurately categorize student drinkers. Additionally, we will examine if the suggestion of Wechsler and colleagues (Wechsler and Austin, 1998; Wechsler et al., 1995; Wechsler and Nelson, 2001)—that each subsequent drinker type experiences more alcohol-related problems than the preceding drinker type—is applicable in our sample. Finally, we will examine the variability among the riskiest drinkers: those with a frequent-binge-drinker label.

Method

Participants

This study used three different samples—volunteer students, students adjudicated for violating campus alcohol policies, and male freshmen assessed during their initial semester. All participants were part of broader group interventions at a private West Coast university and completed local institutional review board-approved consent forms before participating in this study.

Volunteer participants included 104 students who received class credit through the university psychology subject pool. Participants' mean (SD) age was 19.02 (1.99) years; 67% ($n = 70$) were women, and 76% ($n = 79$) were freshmen. Sixty percent ($n = 62$) of participants were white, with the remaining 40% belonging to several different ethnic backgrounds. Adjudicated participants were 283 students referred to a broader group intervention study for violating campus alcohol policies during a 2-year period (LaBrie et al., 2006a). Participants' average age was 18.70 (1.69) years; 60% ($n = 171$) were men, 63% ($n = 178$) were freshmen, and 78% ($n = 220$) were white. All adjudicated participants who participated in the study received campus judicial credit; others who chose not to participate were given a different sanction. Male freshmen participants were 238 subjects recruited and paid to participate in a larger group intervention study (LaBrie et al., 2006b). Male freshmen were targeted because of their high-risk status for alcohol problems, as suggested by the National Institute on Alcohol Abuse and Alcoholism (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). Participants' average age was 18.06 (0.48) years, and 63% ($n = 150$) were white.

Design and procedure

During 2 sequential academic years, participants (in groups of 10-20) filled out a demographic questionnaire and indicated how often they experienced each of the 23 items on the Rutgers Alcohol Problem Index (RAPI) in the past month (White and Labouvie, 1989). In the group, all participants received calendars and completed an individual Timeline Followback (TLFB; Sobell and Sobell, 1992) assessment of alcohol use in the past 3 months. They indicated all the days they drank and how much they drank in the past 3 months on their calendars. Although the TLFB is usually performed during a one-on-one interview, evidence supports the comparability of using a group TLFB to the individual method (LaBrie et al., 2005; Pedersen and LaBrie, 2006). This retrospective calendaring method has displayed reliable estimates of past drinking behavior with college students (Sobell et al., 1986). Participants drew a star on the calendars for each day they consumed five/four or more drinks in one sitting (defined as one drinking event lasting about 2-3 hours).

Results

For each sample, we computed the 2-week drinker type as defined by Wechsler and Nelson (2001) and elaborated on in the introduction. Each participant's drinker type for the first 2 weeks (14 days) of the prior month was compared with the drinker type formed using the second 2 weeks (14 days) of the same month, the latter being the time period in the Wechsler and Nelson (2001) definition. Drinking days in the first and second 2-week periods for all participants were moderately correlated ($r = .667$, $p < .001$), revealing that both 2-week periods contained similar numbers of drinking days across participants. Additionally, all data were collected over 2 years, and participants' 2-week periods varied. For all participants, a confusion matrix of 625 valid cases yielded a κ statistic of .381. Kappa is a measure of reliability for categorical variables determining the rate of agreement between drinker-type labels for an individual. Fleiss (1981) suggested that the lowest κ value acceptable as good to excellent is .60. Thus, the drinker-type definition had less-than-adequate reliability during equivalent periods.

Similarly, for the three samples separately, κ statistics revealed less-than-adequate reliability (.281 for coed volunteer participants, .361 for the adjudicated participants, and .399 for the male freshmen participants). A crosstabular table comparing drinker-type labels among all samples during the first and second 2 weeks of the month is presented (Table 1).

Gender differences

Gender differences were examined by combining the three datasets. Discrepancies existed between drinker-type

TABLE 1. Percentage of agreement between drinker-type labels in the second 2 weeks of month versus first 2 weeks of month

| | Drinker type first 2 weeks | | | | | |
| | Nonbinge drinker | | Binge drinker | | Frequent binge drinker | |
Drinker type second 2 weeks	n	%	n	%	n	%
Nonbinge drinker						
All participants (n = 175)	121	69	41	23	13	8
Volunteers (n = 36)	24	67	12	33	0	0
Adjudicated (n = 52)	32	62	14	27	6	11
Male freshmen (n = 87)	65	75	15	17	7	8
All males (n = 120)	91	76	19	16	10	8
All females (n = 55)	30	55	22	40	3	5
Binge drinker						
All participants (n = 213)	55	26	94	44	64	30
Volunteers (n = 41)	17	42	16	39	8	19
Adjudicated (n = 86)	15	17	41	48	30	35
Male freshmen (n = 86)	23	27	37	43	26	30
All males (n = 148)	35	24	67	45	46	31
All females (n = 65)	20	31	27	41	18	28
Frequent binge drinker						
All participants (n = 237)	20	8	64	27	153	65
Volunteers (n = 27)	1	4	11	41	15	55
Adjudicated (n = 145)	15	10	33	23	97	67
Male freshmen (n = 65)	4	6	20	31	41	63
All males (n = 173)	13	8	44	25	116	67
All females (n = 64)	7	11	20	31	37	58

labels for male participants (κ = .428) and female participants (κ = .265). Drinker-type inconsistency data by gender are included in Table 1.

Alcohol-related consequences

Wechsler and colleagues (Wechsler and Austin, 1998; Wechsler et al., 1995; Wechsler and Nelson, 2001) argue that the five/four measure is a threshold for experiencing alcohol-related consequences. Nonbinge drinkers (i.e., those who are labeled using the current definition as not consuming five/four drinks), therefore, should not experience a large range of alcohol-related consequences. Using the current 2-week definition, however, nonbinge drinkers in the three samples experienced a wide range of alcohol-related consequences. For the volunteers, 36 nonbinge drinkers experienced a mean of 2.14 (2.61) problems in the past month, ranging from 0 to 11, with 28% experiencing three or more consequences in the past month. Fifty-two adjudicated nonbinge drinkers experienced a mean of 3.18 (2.92) problems in the past month, ranging from 0 to 11, with 38% experiencing three or more consequences in the past month. For the male freshmen sample, 87 nonbinge drinkers experienced a mean of 2.01 (2.57) problems, ranging from 0 to 11, with 23% experiencing three or more consequences in the past month. Although frequent binge drinkers and binge drinkers experienced more mean alcohol-related problems than nonbinge drinkers (F = 43.58, 2/607 df, p < .001; mean = 15.25 [15.99], 8.23 [10.30], and 4.14 [7.38] for

groups, respectively), nonbinge drinkers experienced a range of consequences—for some, up to 11 consequences in 1 month.

Further, we separated the nonbinge drinkers into those who were consistently typed across both 2-week periods (n = 121) and those who were inconsistently typed (n = 54). The inconsistently typed group (nonbinge drinker in one 2-week period and either binge drinker or frequent binge drinker in the other 2-week period) had significantly more problems than the consistently typed group (mean = 7.37 [10.75] and 2.69 [4.55], respectively; t = 4.87, 335 df, p < .001). Also, when compared with the binge-drinker group, there was no difference between the 54 inconsistently typed nonbinge drinkers on alcohol consequences (p = .907). This suggests that differences between nonbinge drinkers and binge drinkers on consequences are the result of low numbers of consequences in consistently typed nonbinge drinkers.

Frequent-binge-drinker variation. There was a high level of variability of heavy drinking among those classified as frequent binge drinkers using the original definition's 2-week period. In the past month, frequent binge drinkers could have between 3 and 30 drinking days where they consumed five/four or more drinks and still be classified at the same risk. For the volunteer sample of frequent binge drinkers, the number of five/four or more drinking events in the past month ranged from 3 to 13 with a mean of 7.48 (2.56). For the adjudicated participants, five/four or more drinking events ranged from 3 to 26 with a mean of 9.62 (5.10), whereas for the freshmen participants five/four or more drinking events ranged from 3 to 22 with a mean of 9.02 (4.06). The current frequent-binge-drinker label does not differentiate those who drink at levels well beyond three heavy-drinking events.

Next, we combined the samples to examine the differences in alcohol-related negative consequences among frequent binge drinkers (N = 235). All frequent binge drinkers had a mean of 9.21 (4.64) occasions where five/four drinks were consumed in the month observed. We split these drinkers into three groups based on how many standard deviations they fell from the group mean of the five/four drinks per occasion variable. Group 1 contained 48 participants who drank at or below 1 SD from the mean (3 to 5 five/four drinking occasions in the past month; mean = 3.96 [0.83]). Group 2 contained 151 participants who drank within 1 SD from the mean (6 to 13 five/four drinking occasions in the past month; mean = 8.41 [2.13]). Group 3 contained 36 participants who drank at more than 1 SD from the mean (14 to 26 five/four drinking occasions in the past month; mean = 17.83 [3.60]). Each successive group experienced significantly higher composite RAPI scores than the previous group (Group 1 mean = 11.30 [11.07]; Group 2 mean = 14.73 [14.95]; Group 3 mean = 23.48 [22.94]; F = 13.22, 2/365 df, p < .001). This suggests high variability

among alcohol-related problems for frequent binge drinkers and the need to better classify these students to identify those whose drinking is most problematic.

Discussion

The findings herein suggest that the 2-week definition of drinker type currently used may not be an accurate portrayal of a college students' typical heavy-drinking behavior. Using three samples of different college student drinkers, we compared heavy episodic drinking behavior during the last 2 weeks of the month with heavy episodic drinking behavior during the first 2 weeks of the month. Fifty of 104 (48%) volunteers, 113 of 286 (40%) adjudicated participants, and 95 of 238 (40%) male freshmen were classified differently. Of significance, nearly one third or more of those classified as nonbinge drinkers in each sample were classified as either binge drinkers or frequent binge drinkers in the first 2 weeks of the month. Thus, those labeled as nonbinge drinkers actually engaged in heavy episodic drinking at some point during the month. Finally, those students labeled frequent binge drinkers drank five/four or more drinks in one sitting between 3 times and 26 times within the past month. Not surprisingly, as heavy episodic drinking occasions increased among this group, alcohol-related negative consequences increased significantly, suggesting that the current label has too much variation in it to adequately locate the heaviest drinkers. There may actually be an even more at-risk group within the frequent binge drinker category. The failure to consistently and accurately typify student drinkers represents a serious flaw in the drinker-type definition, with implications for intervention and research.

Using an inconsistent typology may be particularly troublesome during recruitment of students to interventions and during data reporting. If intervention or research inclusion criteria require binge-drinker or frequent-binge-drinker status, using the current definition approximately 30% of heavy drinkers may be excluded and not receive a needed intervention. In addition, studies examining treatment effects (e.g., Turrisi et al., 2001; Werch et al., 2000) or questionnaires and studies that can be used to examine the heavy episodic drinking behavior of students (e.g., CORE, 2005; Vickers et al., 2004) use the current 2-week definition. Results reporting behavior of the heaviest drinkers may not truly be reporting on the actual heaviest drinkers. Studies may report that frequent binge drinkers decreased drinking at follow-up, when in reality the labeling of students as heavy drinkers was based on an abnormal 2-week period of behavior.

Further, consistent with data from Wechsler and colleagues (Wechsler and Austin, 1998; Wechsler et al., 1995; Wechsler and Nelson, 2001), each successive drinker type in the current samples experienced more alcohol-related con-

sequences than the preceding type; nonetheless, nonbinge drinkers still experienced a wide range of alcohol consequences. Although students who do not engage in heavy episodic drinking may experience alcohol-related consequences at some point, the substantial number of alcohol-related consequences found among this drinker type (which in name states that these students are nonbinge drinkers) is of considerable importance, because roughly 30% of all nonbinge drinkers did engage in heavy episodic drinking in the past month. It is unknown if nonbinge drinkers experienced problems when drinking less than five/four drinks or if the problems emerged on the days in the first 2 weeks of the month when these participants drank five/four or more drinks. However, those nonbinge drinkers who were inconsistently typed did not differ from binge drinkers on alcohol-related consequences. Closer examination of individual problems revealed that 15% of nonbinge drinkers felt they needed more alcohol than they used to in order to get the same effect (i.e., tolerance), 9% experienced a blackout, and 9% passed out from drinking—problems generally associated with heavy drinking behavior. Wechsler and colleagues (Wechsler and Austin, 1998; Wechsler et al., 1994, 2000; Wechsler and Nelson, 2001) do not argue that nonbinge drinkers never experience consequences from limited use, but the results herein suggest that students labeled as nonbinge drinkers using the 2-week time period but who did drink five/four or more drinks on at least one occasion in the first 2 weeks of the month account for the majority of the problems experienced by this group.

Longitudinal studies that examine heavy episodic drinking during longer periods reveal that students report inconsistent heavy episodic drinking across time (Schulenberg et al., 1996; Weingardt et al., 1998). The current study reveals inconsistencies in this behavior within just 1 month. There can be much variation in 2 weeks of behavior; specifically, if the assessed 2 weeks portrays a student's atypical heavy (e.g., spring break) or light (e.g., finals week) drinking behavior. Although the suggestion of a new classification scheme is outside the scope of this brief report, it is clear that 2 weeks is too brief a period to accurately assess and label a student's drinking. Further research looking at different classification schemes assessing longer time periods appears warranted.

Several limitations mark the current study. The samples consisted of mostly freshmen students (nearly 80%), and although freshmen are an important population of at-risk students (NIAAA, 2002), it would be beneficial to test the consistency of drinker-type labels among upperclassmen as well as between different ethnicities. Although three different diverse samples were used, studies implemented on a broader scale at different universities are needed. Another limitation is the use of self-reported, retrospective data. Although both the TLFB and self-reports of alcohol use are reliable and valid when used with college students (O'Hare,

1991; Sobell et al., 1986), no level of actual intoxication (e.g., BAC) was measured. Current research suggests that the five/four measure does not accurately assess high BAC levels (Beirness et al., 2004; Lange and Voas, 2001; Perkins et al., 2001). The length of time in which five/four drinks are consumed and the participant's gender and body mass all need to be considered to determine the maximum BAC reached in any drinking episode. Although participants in the current study indicated on their TLFBs whether five/four drinks occurred in one sitting, they may never have achieved a BAC level of .08 g/dl or higher—generally considered the level at which negative consequences increase. Future research examining improved ways to classify heavy-drinking college students using BAC levels appears warranted.

Despite these limitations, the current report highlights the problem with using labels based on a brief snapshot of behavior, including inconsistencies across studies and potential mislabeling of individuals and misdirecting of targeted interventions. Future studies are necessary that further examine this inconsistency with larger and more diverse samples and that expand beyond descriptive data to test this category model. More research is needed to determine how best to classify, label, or identify heavy-drinking college students to implement and tailor interventions toward these individuals.

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