Published in final edited form as:

Addict Behav. 2008 January ; 33(1): 196–200. doi:10.1016/j.addbeh.2007.07.001.

A Self-Administered Timeline Followback to Measure Variations in Underage Drinkers' Alcohol Intake and Binge Drinking

R. Lorraine Collins^{a,*}, Todd B. Kashdan^b, James R. Koutsky^a, Elizabeth T. Morsheimer^a, and Charlene J. Vetter^a

^aResearch Institute on Addictions, University at Buffalo, State University of New York, 1021 Main Street, Buffalo, New York 14203, USA

^bDepartment of Psychology, George Mason University, Mail Stop 3F5, Fairfax, Virginia 22030 USA

Abstract

Underage drinkers typically have not developed regular patterns of drinking and so are likely to exhibit situational variation in alcohol intake, including binge drinking. Information about such variation is not well captured by quantity/frequency (QF) measures, which require that drinkers blend information over time to derive a representative estimate of “typical” drinking. The Timeline Followback (TLFB) method is designed to retrospectively capture situational variations in drinking during a specific period of time. We compared our newly-developed Self-administered TLFB (STLFB) measure to a QF measure for reporting alcohol intake. Our sample of 429 (men = 204; women = 225) underage (i.e., age 18-20 years) drinkers completed the two drinking measures and reported on alcohol problems. The STLFB and QF measures converged in assessing typical daily intake, but the STLFB provided more information about situational variations in alcohol use and better identification of regular versus intermittent binge drinkers. Regular binge drinkers reported more alcohol problems. The STLFB is an easy-to-administer measure of variations in alcohol intake, which can be useful for understanding drinking behavior.

Keywords

Self-administered Timeline Followback; Typical drinking; Underage drinkers; Binge drinking

Underage drinkers experiment with alcohol use and thus tend to intersperse periods of abstinence when alcohol is not available with excessive drinking when alcohol is available (DelBoca, Darkes, Greenbaum, & Goldman, 2004; Wechsler, Dowdall, Davenport & Rimm, 1995). They report relatively high rates of binge drinking and experience related personal and societal costs (Miller, Levy, Spicer, & Taylor, 2006; White, Kraus, & Swartzwelder, 2006).

Although there is a lot of intra- and inter-individual variability in underage drinking, many commonly used self-report measures of alcohol use are based on the quantity and frequency (QF) of “typical” drinking (e.g., Collins, Parks, & Marlatt, 1985). QF measures are easy to administer, but are less sensitive to variations in alcohol use because they require the blending of drinking behavior over time to derive an estimate of “typical” drinking. The TLFB (Sobell

*Corresponding author. Tel.: +1 716 887 2523; fax: +1 716 887 2252 E-mail address: E-mail: collins@ria.buffalo.edu (R. L. Collins).

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

& Sobell, 1992) is a reliable and valid alternative to QF measures. It uses a calendar and structured interview to collect retrospective reports of daily alcohol intake during a specific period of time, thereby capturing situational variations in alcohol use (DelBoca et al., 2004).

The TLFB has limitations related to its reliance on retrospection, particularly when directly compared to prospective approaches that collect data in close proximity to drinking episodes (e.g., Carney, Tennen, Affleck, DelBoca, & Kranzler, 1998). Even so, we propose that when used in a noninterview format, such as our Self-Administered TLFB (STLFB; Collins, et al., 2003), it may serve as a useful compromise between ease of administration and the collection of detailed information about variations in alcohol intake. In the current study, we compared data from our STLFB and a QF measure of typical weekly drinking to examine underage drinking. We hypothesized that the STLFB would provide better information about variations in alcohol intake, including regular versus intermittent binge drinking. We also examined negative consequences and considered gender as a moderator of alcohol use and related outcomes.

1. Method

1.1 Participants

We used advertising to recruit underage drinkers ($N = 430$) in metropolitan Buffalo, NY. The inclusion criteria were: age (18 - 20 years), at least 4-11 drinks/week, no previous treatment for alcohol/drug problems, no medical contraindications to alcohol use, and no legal problems. The sample of 204 men (48%) and 226 women (52%) had a mean age of 19.03 years ($SD = 0.78$). Most were single (99.8%) and currently enrolled in university ($n = 374$; 87%). They self-identified mainly as European American ($n = 377$; 87.7%) and African American ($n = 20$; 4.7%). Small groups ($n = 2 - 5$) completed one of three counterbalanced orders of questionnaires. Each participant was paid \$20. This research was approved by the IRB of the University at Buffalo.

1.2 Measures

The *General Information Questionnaire* (GIQ) assessed demographics (e.g., gender), and drinking information. Quantity and frequency (QF) of alcohol intake were measured by the Daily Drinking Questionnaire (Collins et al., 1985). Participants also responded *Yes/No* as to whether they had experienced each of nine acute negative consequences (e.g., nausea) after drinking.

The *Self-administered Timeline Followback* (STLFB; Collins et al., 2003) consists of a calendar on which participants provided retrospective reports of daily alcohol intake. They wrote down special events and then reported on drinking during the past 30 days (cf. LaBrie et al., 2005; Pederson & LaBrie, 2006). Each cell of the calendar contained four questions: Alcohol? (Yes/No); How Many (standard drinks)?; Type? (Beer, Wine, Wine Cooler, Liquor); Other Drugs (e.g., marijuana)? (Yes/No).

The *Rutgers Alcohol Problem Index* (RAPI; White & Labouvie, 1989), assessed the experience of 23 alcohol problems during the past 3 years. Participants indicated the number of times (0 to ≥ 4) they had experienced each problem ($\alpha = .88$).

2. Results

2.1. Daily Drinking and Alcohol Problems

Average alcohol intake based and significant gender differences on the STLFB and QF are presented in Table 1. The STLFB provided more indicators of alcohol intake (e.g., peak intake/

day) than the QF. Generally, totals for the STLFB were lower than the QF. However, there were significant positive correlations between the STLFB's and QF's mean alcohol intake for each day of the week (e.g., $r = .50$, $p < .001$ for Sunday; $r = .73$, $p < .001$ for Tuesday), which suggested that the two measures provided similar information on some variables.

Participants reported moderate levels of acute negative effects of alcohol (GIQ; $M = 4.27$, $SD = 1.85$) and relatively low occurrence of longer-term alcohol problems (RAPI; $M = 22.59$, $SD = 13.22$). To examine the relationships between the two measures of alcohol intake and alcohol problems, we separately correlated the GIQ and RAPI scores on the different indicators of alcohol intake from the STLFB and QF. All of the correlations were significant at $p < .01$ and the pattern of results were similar for the GIQ and RAPI. That is, positive correlations ranged from the mid 20s (e.g., $r = .25$ for GIQ and STLFB peak intake) to the low 40s (e.g., $r = .42$ for RAPI and STLFB total drinks/month). The correlation for proportion of abstinent days was low and negative (e.g., $r = -.25$ for GIQ). There were gender differences in negative consequences. On the GIQ, men ($M = 4.58$, $SD = 1.85$) reported significantly more acute effects compared to women ($M = 3.98$, $SD = 1.81$), $t(426) = 3.38$, $p < .001$. On the RAPI, men ($M = 23.80$, $SD = 12.57$) scored marginally higher than women, $M = 21.48$, $SD = 13.72$), $t(427) = 1.82$, $p < .07$.

2.2. Binge Drinking

Using a cut-off of 5-6 drinks/day, 56.3% of the sample were binge drinkers on the STLFB and 77.2% were binge drinkers on the QF. We used gender-specific criteria (Wechsler et al., 1995) and STLFB data to create two groups of binge drinkers; regular (all 4 weeks) bingers ($n = 210$; 49%) and intermittent (1 to 3 weeks) bingers ($n = 211$, 51%). Alcohol problems increased with the number of binge weeks. On the GIQ, regular bingers ($M = 4.84$, $SD = 1.73$) reported significantly more acute symptoms than intermittent bingers ($M = 3.72$, $SD = 1.80$), $t(428) = 6.57$, $p < .001$. On the RAPI, regular bingers ($M = 27.26$, $SD = 13.26$) reported significantly more problems than intermittent bingers ($M = 18.05$, $SD = 11.08$), $t(428) = 7.69$, $p < .001$.

3. Discussion

The STLFB was developed to collect information on daily variations in alcohol intake using a format that was less labor-intensive than the commonly-used TLFB interview (Sobell & Sobell, 1992). The STLFB and the QF measure converged in assessing the typical daily intake of alcohol and had similar relationships to alcohol problems. The QF identified more binge drinkers, but the STLFB provided more information on binge-drinking patterns. Both measures generated the expected gender differences; compared to women, men consumed more alcohol. The QF may be useful in some situations, but its format can introduce nonrandom error related to differences in how each person computes her/his typical drinking. The STLFB provided retrospective daily data that had a number of advantages, including capturing situational variations in drinking (cf. Del Boca et al., 2004) and the ability to generate a variety of indices of alcohol intake. Such information can be useful for understanding underage drinking.

This study has limitations that include the reliance on cross-sectional data and the need for more psychometric information on the STLFB. Our recruitment strategy raises potential sources of sample bias. Future research should directly compare the STLFB with: the TLFB interview, data from collaterals, behavioral (e.g., field) observations, and physiological (e.g., alcohol content in breath or blood) indices of alcohol intake.

Acknowledgments

This research was supported by NIAAA, NIH Grant #AA07595 awarded to R. Lorraine Collins. Portions of this research were presented at the APA annual convention, Toronto, Canada, August 2003. We thank Elizabeth Giles and Sandy Wilson for their assistance.

References

- Carney MA, Tennen H, Affleck G, Del Boca FK, Kranzler HR. Levels and patterns of alcohol consumption using Timeline Followback, daily diaries and real-time “electronic interview”. *Journal of Studies on Alcohol* 1998;59:447–454. [PubMed: 9647427]
- Collins, RL.; Kashdan, TB.; Koutsky, JR.; Morsheimer, ET.; Vetter, CJ.; Wilson, SD. A Self-administered Timeline Followback measure of underage drinking. American Psychological Association; Toronto, Ontario, Canada: Aug. 2003
- Collins RL, Parks GA, Marlatt GA. Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting & Clinical Psychology* 1985;53:189–200. [PubMed: 3998247]
- DelBoca FK, Darkes J, Greenbaum PE, Goldman MS. Up close and personal: Temporal variability in the drinking of individual college students during their first year. *Journal of Consulting and Clinical Psychology* 2004;72:155–164. [PubMed: 15065951]
- LaBrie J, Pedersen E, Earleywine M. A group administered timeline followback assessment of alcohol use. *Journal of Studies on Alcohol* 2005;66:693–697. [PubMed: 16329460]
- Miller TR, Levy DT, Spicer RS, Taylor DM. Societal costs of underage drinking. *Journal of Studies on Alcohol* 2006;67:519–528. [PubMed: 16736071]
- Pedersen ER, LaBrie JW. A within-subject validation of a group-administered timeline followback for alcohol use. *Journal of Studies on Alcohol* 2006;67:332–335. [PubMed: 16562417]
- Sobell, LC.; Sobell, MB. Timeline followback: A technique for assessing self-reported alcohol consumption. In: Litten, RZ.; Allen, JP., editors. *Measuring alcohol consumption: Psychosocial and biochemical methods*. Humana; Totowa, NJ: 1992. p. 41-72.
- Wechsler H, Dowdall G, Davenport A, Rimm E. A gender-specific measure of binge drinking among college students. *American Journal of Public Health* 1995;85:982–985. [PubMed: 7604925]
- White AM, Kraus CL, Swartzwelder HS. Many college freshmen drink at levels far beyond the binge threshold. *Alcoholism: Clinical & Experimental Research* 2006;30:1006–1010.
- White HR, Labouvie EW. Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol* 1989;50:30–37. [PubMed: 2927120]

Table 1
Alcohol intake and gender differences based on the STLFB and QF

	STLFB				QF			
	STLFB	QF	Women	Men	t-test (df)	Women	Men	t-test (df)
Total Drinks/month	60.81 (43.73)	71.47 (48.37)	48.22 (33.15)	74.69 (49.50)	6.44 *** (349)	58.32 (36.06)	86.07 (55.67)	5.99 *** (333)
Ave drinks/day	2.17 (1.56)	2.55 (1.73)	1.72 (1.18)	2.67 (1.77)	6.44 *** (349)	2.08 (1.29)	3.07 (1.99)	5.99 *** (333)
# Drinks/drinking day	5.75 (2.64)	-----	4.86 (1.95)	6.73 (2.94)	7.70 *** (347)	-----	-----	-----
Proportion Abstinent Days	.64 (.16)	-----	.66 (.14)	.61 (.18)	-2.97 ** (385)	-----	-----	-----
Peak intake day	10.72 (5.90)	-----	8.96 (4.13)	12.67 (6.88)	6.69 *** (326)	-----	-----	-----

Note. For variables, standard deviations are presented in parentheses. For gender comparisons, t-test degrees of freedom are presented in parentheses.

= $p < .001$;

**
= $p < .01$ (all 2-tailed tests).