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Short communication

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], Charlene J. Vetter [a]

[a] *Research Institute on Addictions, University at Buffalo, State University of New York, 1021 Main Street, Buffalo, New York 14203, USA*
[b] *Department 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.
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Keywords: Self-administered Timeline Followback; Typical drinking; Underage drinkers; Binge drinking

☆ The current measure is not the only self-administered version of the TLFB. The Sobells who originated the TLFB have provided instruction for the self-administration of their TLFB interview. The current measure differs in format because it includes questions embedded in each daily cell of the calendar.

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

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1. Introduction

Underage drinkers experiment with alcohol use and thus tend to intersperse periods of abstention 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 & 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 non-interview 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.

2. Method

2.1. 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 a university (n=374; 87%). They were 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.

2.2. 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.

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

	STLFB	QF	STLFB			QF		
	Sample	Sample	Women	Men	*t*-test (*df*)	Women	Men	*t*-test (*df*)
Total drinks/month	60.81	71.47	48.22	74.69	6.44 ***	58.32	86.07	5.99 ***
	(43.73)	(48.37)	(33.15)	(49.50)	(349)	(36.06)	(55.67)	(333)
Average drinks/day	2.17	2.55	1.72	2.67	6.44 ***	2.08	3.07	5.99 ***
	(1.56)	(1.73)	(1.18)	(1.77)	(349)	(1.29)	(1.99)	(333)
# Drinks/drinking day	5.75	–	4.86	6.73	7.70 ***	–	–	–
	(2.64)		(1.95)	(2.94)	(347)			
Proportion	0.64	–	0.66	0.61	−2.97 **	–	–	–
abstinent days	(0.16)		(0.14)	(0.18)	(385)			
Peak intake day	10.72	–	8.96	12.67	6.69 ***	–	–	–
	(5.90)		(4.13)	(6.88)	(326)			

Note. *** = $p<.001$; ** = $p<.01$ (all 2-tailed tests). For variables, standard deviations are presented in parentheses. For gender comparisons, *t*-test degrees of freedom are presented in parentheses.

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, Pedersen, & Earleywine, 2005; Pedersen & 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).

3. Results

3.1. 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

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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), $t(427)=1.82$, $p<.07$.

3.2. 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, $p<.001$.

4. 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 non-random 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 (c.f. DelBoca 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.

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