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A Within-Subjects Validation of a Group-Administered Timeline Followback for Acohol Use*

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Abstract

Objective—The current study uses a within-subjects randomized design with the Timeline Followback (TLFB) method administered in groups or to individuals to determine the equivalence of these methods.

Method—One hundred and four male and female college students who reported drinking at least once in the past 3 months completed the TLFB during a one-on-one interview, as well as in a group setting days apart. The two administrations were counterbalanced among the participants. Drinking variables assessed were drinking days, average drinks, total drinks, and maximum drinks consumed both during a 3-month (90 days) and a 1-month (30 days) period.

Results—Repeated measures analyses revealed no differences within subjects between the individual TLFB and the group TLFB on any of the four assessed drinking variables in the past 3 months and the past 1 month. Pearson's correlation coefficients revealed strong and significant correlations between the two administration styles. Heavy episodic drinking behavior was similar across administration styles as well. No differences between administration styles were consistent regardless of which administration was received first.

Conclusions—The study suggests that the group TLFB yields similarly accurate results to the previously validated individual TLFB. The group-administered TLFB could be used in clinical and research settings as an efficient means of collecting information from large numbers of individuals.

The timeline followback (TLFB; Sobell and Sobell, 1992) is a popular alcohol consumption assessment tool used by clinicians and researchers. The TLFB is a calendar of 1–3 months that provides visual cues to aid persons in retrospective recall of behavior. During a one-on-one interview, an interviewer typically leads a participant back through the calendar, filling in drinking days and quantity, while using personally memorable "marker days" (i.e., birthdays, holidays) to aid recall. The TLFB demonstrates high reliability and validity when administered individually by an interviewer (Sobell and Sobell, 1992; Sobell et al., 1988). The TLFB is also reliable and accurate when given individually over the telephone (Cohen and Vinson, 1995; Sobell et al., 1996) or when administered by a computer program (Sobell et al., 1996). It is reliable across different populations, including homeless and psychiatric

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patients (Sacks et al., 2003) as well as college students (Sobell et al., 1986). Further, the TLFB yields comparable frequency estimates to a interactive voice response system (IVR), where participants daily report their drinking behavior through an automated telephone call (Searles et al., 2002; 2000).

Sobell and Sobell (1992, 2003) suggest that the TLFB is a more thorough measure of drinking behavior than single-item self-reports because it is more sensitive to erratic days of heavy drinking. The TLFB further provides richer data than single items because it examines every drinking event over a time period and allows clinicians and researchers to observe drinking patterns, such as heavy drinking incidences during holidays and on weekends. Nonalcohol research performed with event history calendars (EHCs) suggested that calendaring of behavior is more reliable and accurate than single-item self-reports (Belli, 1998; Belli et al., 2001). Similar to the TLFB method, administration of the EHCs relied on cueing individuals with distinctive events from their own past to facilitate memory of specific social and economic events. Schober and Conrad (1997) suggest that EHCs lead to increased accuracy because of encouragement by interviewers and by aiding participants in detecting inconsistencies on their reported behavior through the use of a visual cue.

We previously suggested that a group-administered TLFB is comparable to the formerly validated individual interview TLFB based on comparing correlations between self-report data to group and to individual TLFB (LaBrie et al., 2005). Both administration styles yielded values comparable to frequently used, valid, and reliable self-report measures. However, this previous study did not employ a within-subjects design and, thus, reached tentative conclusions through comparing administration styles across unequal samples. The current study employs a within-subjects design to further validate the group TLFB and display its accuracy in assessing both quantity and frequency. It was hypothesized that participants would report equivalent means during both administrations of a 3-month TLFB (group and individual) for four drinking variables: drinking days, average drinks, total drinks per month (quantity × frequency), and maximum drinks consumed at one time. If validated, the group TLFB could prove an asset to researchers and clinicians by reducing the time/cost burden of individual interviews in assessing individual drinking patterns.

Method

Participants

A local institutional review board review committee approved the study, and 130 participants recruited from the university's psychology subject pool consented to participate. They received assurances of confidentiality for their responses, as well as course credit for participation. Twenty-two nondrinkers who reported no drinking during both TLFB administrations and four participants who did not complete both administrations were excluded from analyses. Among the 104 participants who drank alcohol at least once in the past 3 months, 34 were men (33%), and 70 were women (67%). They had a mean (SD) age of 19.02 (1.99) years and were predominantly white (60%), with 15% Hispanic, 14% Asian/Pacific Islander, 2% black, and 9% mixed ethnicity or "other."

Design and procedure

Participants came to two scheduled meetings during which they completed a brief demographic questionnaire, which included three open-ended self-report items for drinking days, average drinks, and maximum drinks in the past 30 days as well as an individual and group TLFB of drinking behavior over the previous 3 months. The TLFBs were counterbalanced, with half receiving the group TLFB first and the other half receiving the individual TLFB first. The administrations were performed between 2 and 5 days apart with a mean of 3.32 (1.95) days between administrations. At the second assessment meeting, regardless of administration style, participants completed a TLFB over the previous 95 days so that within-subjects comparisons could be made for the same 90-day period. Participants were told only that they would be completing an assessment of alcohol use during two different meetings and were unaware they would receive the same drinking assessment with a different administration format at the second meeting.

Individual interview TLFBs were performed by two research assistants (one man, one woman), and participants were randomly assigned to an interviewer regardless of gender. Interviewers strictly adhered to the guidelines of the one-on-one TLFB (Sobell and Sobell, 2003). Interviewers first asked participants to fill in personal “marker days” on a retrospective calendar. Calendars came marked with certain well-known campus events and national holidays, and participants individually wrote down important personal events (both drinking and nondrinking) that occurred over the period of the calendar. When participants finished labeling marker days, the interviewer explained how they would use the marker days to go back through the calendar day by day to help participants remember all the days they drank and the number of standard drinks (defined for participants as a drink containing 0.5 oz of ethyl alcohol—one 12-oz beer, one 4-oz glass of wine, or one 1.25-oz shot of distilled spirits) they consumed on those days. Interviewers then led participants back through the 3-month calendar, asking “Did you drink this day?” for each day on the 3-month calendar, writing in the number of standard drinks for participants when a drinking day was noted. Participants were encouraged to remember drinking days and quantities drank in the past 3 months and were told that despite the difficulty of the task they could remember surprisingly well and should try their best.

The group TLFB was given in groups of 10–15 participants and administered by a master’s-level researcher different from the individual TLFB facilitators. The facilitator followed the individual TLFB script as close as possible, with the exception of the individualized attention to each day on the calendar. The facilitator first asked participants to individually fill in their own personal marker days on a retrospective calendar that included well-known campus events and holidays. After all participants completed filling in their personal marker days, the facilitator defined a standard drink and instructed participants to go back through their calendar, day by day starting from the current day, and individually fill in the number of standard drinks they consumed on each day they drank. The facilitator made it clear to participants to go back through the calendar retrospectively, starting from the current day and going back through each day of the calendar while using their personal patterns and marker days to assist recall. The facilitator gave participants the same encouragement and time needed as they were given in the individual TLFB administration.

Results

Drinking days, average drinks, total drinks per month, and maximum drinks consumed during one occasion were computed for the 3-month TLFB (90 days) as well as for the previous 1-month (30 days) for both the individual TLFB and the group TLFB. Table 1 contains means and standard deviations as well as correlations between administration styles.

Participants did not significantly differ on any of the four drinking variables assessed in the 3-month TLFB or in the previous 1 month of the TLFB. Repeated measures analyses for the 3-month TLFB revealed no overall differences among drinking days (F = 0.863, 1/103 df, p = .355), average drinks (F = 0.083, 1/103 df, p = .774), total drinks per month (F = 0.000, 1/103 df, p = .997), and maximum drinks (F = 0.494, 1/103 df, p = .484). Similar nonsignificant differences were found among administration styles for the previous 1-month TLFB on drinking days (F = 0.478, 1/103 df, p = .491), average drinks (F = 0.001, 1/103 df, p = .975), total drinks per month (F = 0.001, 1/103 df, p = .981), and maximum drinks (F = 1.039, 1/103 df, p = .310). Participants also displayed strong correlations between their individual TLFB and group TLFB on all four assessed variables during the 3-month TLFB as well as during the previous 1-month on the TLFB (all $p < .001$).

Using the definition from Wechsler and Nelson (2001) as five drinks or four drinks in a sitting for men and women, respectively, heavy episodic drinking was analyzed. Heavy episodic drinking occasions from the 3-month TLFB revealed nearly identical means between the individual and group TLFB (8.61 [8.55] vs 8.61 [9.02]; t = 0.000, 103 df, p = 1.00) and a strong correlation between administration styles (r = .938, $p < .001$). Prior month heavy episodic drinking revealed no differences between individual and group TLFB (3.02 [3.18] vs 3.12 [3.25]; t= .850, 103 df, p = .397), and a similar strong correlation (r = .923, $p < .001$).

To test for priming effects, correlations between 3-month individual and group TLFB for those who received the individual TLFB first (n = 45) were compared to those who received the group TLFB first (n = 59). Fischer's R to Z transformations revealed no significant differences in correlations between administration styles for any drinking variable except average drinks (r = .965 for individual TLFB first and r = .790 for group TLFB first; $p < .001$). Nonetheless, an independent within-subjects t test revealed no differences in mean average drinks for administration order (mean difference of 0.08 [0.59] for individual first vs 0.12 [1.65] for group first; t = 0.763, 102 df, p = .447).

Finally, to demonstrate concurrent validity of the group TLFB, correlations of 1-month TLFB and 1-month self-report items were compared for both administration styles. Correlations were all similar (.797 vs .866 on drinking days; .639 vs .816 on average drinks; and .720 vs .772 on maximum drinks) for individual TLFB and self-report versus group TLFB and self-report, respectively. Fischer's R to Z transformations revealed no differences between correlations of self-report with individual and group TLFB for drinking days and maximum drinks. The correlations for average drinks were significantly different ($p < .01$), with the group TLFB yielding a stronger correlation to self-reported average drinks than the

individual TLFB. However, mean differences between self-report and individual TLFB and mean differences between self-report and group TLFB revealed no differences for average drinks (mean difference = 0.005 [1.69]; $t = 0.032$, 103 df, $p = .975$) and total drinks per month (mean difference = 0.028 [12.28]; $t = 0.024$, 103 df, $p = .981$).

Discussion

The current study employed a within-subjects design to provide further evidence for the validity of the TLFB administered to individuals in a group setting. As predicted and consistent with previous findings (LaBrie et al., 2005), within-subjects analyses revealed no differences between the individual and group TLFB on any alcohol use variables (drinking days, average drinks, total drinks per month, and maximum drinks) for both 3 months or the previous 1 month. Very strong correlations existed between the two administration styles for all four drinking variables. Heavy episodic drinking events in the past 3 months and the past month were also highly similar and strongly correlated between administration styles. These results were consistent regardless of which administration style the participant received first.

Sobell and Sobell (1992, 2003) suggest that the individual TLFB is a more accurate assessment measure than single-item self-reports. By validating a group-administered TLFB, it is anticipated that clinicians and researchers can more easily collect a thorough and richer portrayal of participants' drinking behavior and patterns. The group setting decreases the time/cost burden of individual interviews. Further, the group TLFB, while intended as an assessment of individual drinking, can aid in-group interventions. It may serve as a first level of intervention as individuals within a group personally confront their own drinking behavior-an essential part of several alcohol interventions, including Motivational Interviewing (Miller and Rollnick, 2002). Additionally, mere assessment of drinking behavior may motivate individuals to examine their behavior and seriously consider change (Kalichman et al., 1996), and perhaps having group review and support of the TLFB assessment can further support those striving towards change.

The current study is limited by its sample of college students. Although the problematic drinking habits of college students warrant a valid assessment tool for use in this population, further validation of the group TLFB is warranted with different populations, such as adults, psychiatric inpatients and outpatients, and adolescents. Additionally, although no significant differences were found between administrations, and the correlations between administrations were high, there was a higher correlation between administrations on average drinks when the individual TLFB was given to participants before the group TLFB. Replications of the current study are needed before any conclusions regarding the validity of this administration method can be made.

A major concern in most test-retest studies is memory effects, in which participants may remember their responses from the first administration during the second administration. To assess equivalent time periods in the current study, the second TLFB was administered within a few days of the first, thereby increasing the chances of memory effects. Efforts were made to minimize memory effects within the short time delay. First, participants were unaware during the first administration that they would be completing another TLFB in a

different condition. They were only informed that they would be participating in a study on alcohol and attitudes toward drinking that had two separate parts on two separate occasions. Second, participants encountered different facilitators at each meeting, so that the facilitator did not serve as a marker for recall. Nonetheless much of the consistency observed between the two administrations could have been the result of cueing from simply completing the first assessment. We performed further analyses to see if there was either a direct or moderation effect for days between administrations on each of the drinking variables. Days between administrations did not either directly predict or moderate any alcohol variable. It is possible, however, that if the days between administrations had been longer there would have been such an effect. Nonetheless, despite efforts to control for them, memory effects across this brief time interval are a significant limitation to this study.

Despite the limitations just described, the current study, together with previous findings (LaBrie et al., 2005), provides support for the use of the TLFB in in-group settings. Accurate alcohol use assessment measures are essential both for implementing interventions and research. The expansion of the TLFB, an accurate assessment measure, to group settings may allow clinicians to intervene with several clients at once, either during assessments to determine need for further treatment or during group interventions with users at all levels of severity. In research settings, the group TLFB can be used to collect large amounts of accurate and detailed drinking data from individuals, reducing time and costs of the individual TLFB administration.

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Table 1

Within-subject means and correlations comparing individual Timeline Followback (TLFB) to group TLFB

Variable	Individual TLFB Mean (SD)	Group TLFB Mean (SD)	Pearson's *r*
Past 3 months			
Drinking days	13.23 (10.14)	12.90 (10.24)	.938‡
Average drinks	4.72 (2.48)	4.68 (2.29)	.855‡
Total drinks per month	72.00 (72.37)	71.99 (78.22)	.950‡
Maximum drinks	8.55 (4.95)	8.69 (4.94)	.911‡
Past 1 month			
Drinking days	4.90 (4.02)	5.00 (4.12)	.940‡
Average drinks	4.36 (2.73)	4.35 (2.48)	.905‡
Total drinks per month	26.15 (28.74)	26.18 (27.52)	.795‡
Maximum drinks	6.72 (4.70)	6.93 (4.82)	.902‡

Notes: There were no significant differences between individual and group TLFB administrations.

‡Correlation significant at $p < .001$.