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Timeline follow-back versus global self-reports of tobacco smoking: A comparison of findings with non-daily smokers

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Abstract

Methods assessing non-daily smoking are of concern because biochemical measures can not verify self-reports beyond 7 days. This study compares two self-reported smoking measures for non-daily smokers. A total of 389 college students, (48% female, 96% white, mean age of 19) smoking between 1 and 29 days out of the past 30, completed computer assessments in three cohorts with the order of administration of the measures counterbalanced. Values from the two measures were highly correlated. Comparisons of Timeline Follow-Back (TLFB) with the global questions for the total sample of non-daily smokers yielded statistically significant differences ($p<.001$), albeit small, between measures with the TLFB resulting on average in 2.38 more total cigarettes smoked out of the past 30 days, 0.46 less smoking days, and 0.21 more cigarettes smoked per day. Analyses by level of smoking showed that the discordance between the measures differed by frequency of smoking. Global questions of days smoked resulted in frequent reporting in multiples of five days, suggesting digit bias. Overall the two measures of smoking were highly correlated and equally effective for identifying any smoking in a 30-day period among non-daily smokers.

Keywords

Assessment; Timeline Follow-back; tobacco; smoking; college students

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Methods to assess non-daily smoking have been a topic of concern and debate among researchers particularly because there are no biochemical methods to verify self-reported smoking over a 30-day period (Mermelstein et al., 2002). Similar to younger students and an increasing proportion of adult smokers, many college students smoke irregularly and infrequently. Of the college students who smoked at least once in the past 30 days, only about one in four smoked every day (Harris et al., 2002; Wetter et al., 2004). Researchers have used multiple methods to assess self-reported smoking among college students, including the use of single-item global questions. Single-item global questions have focused on establishing any smoking in the past 30 days (Substance Abuse and Mental Health Services Administration, 2007) and assessing days of smoking (Core Institute, 1999). Single-item questions that conflate smoking days and number of cigarettes smoked in one question (Wechsler, Rigotti, Gledhill-Hoyt, & Lee, 1998) have been criticized as an indicator of irregular smoking because some students will average one or more cigarettes per day, but not smoke every day (U.S. Dept. of Health and Human Services, 1994).

To address this issue, researchers have used 2-item global questions to assess both smoking days and the number of cigarettes smoked on smoking days (Douglas et al., 1997). Both global methods require self-report over a 30-day period, which has raised concern about recall bias due to unintentional inaccuracy. Further, risk for recall bias increases when the behavior of interest is irregular (Menon, 1993). The use of memory aids is one method used to reduce recall bias. Sobell & Sobell (1992) initially developed the Timeline Follow-Back interview (TLFB) to detail drinking behavior over a 1 to 12 month period preceding the assessment. The TLFB method entails using a key events (such as birthdays) to prompt respondents to provide daily retrospective estimates over a specified time-period. Sobell and others have standardized the TLFB method (L. C. Sobell, Maisto, & Sobell, 1995). TLFB has been shown to be reliable and valid for assessing alcohol use among adults (L. C. Sobell & Sobell, 1978) and college students (M. B. Sobell, Sobell, Klajner, Pavan, & Basian, 1986). Researchers have extended the use of TLFB to measure other behaviors, including cocaine abuse (Hersh, Mulgrew, Van Kirk, & Kranzler, 1999), polysubstance abuse (Duhig, Cavallo, McKee, George, & Krishnan-Sarin, 2005; Fals-Stewart, O'Farrell, Freitas, McFarlin, & Rutigliano, 2000; Levy et al., 2004), and sexual behavior (Schroder, Johnson, & Wiebe, 2007).

While evidence of the suitability of TLFB for assessing smoking is relatively sparse, we were able to locate four studies that compared smoking data obtained from TLFB with other self-reported measures of tobacco use. In three studies, participants were adults (Brown et al., 1998; Gariti, Alterman, Ehrman, & Pettinati, 1998; Toll, Cooney, McKee, & O'Malley, 2005) and, in one study, participants were adolescents (Lewis-Esquerre et al., 2005). Study participants smoked every day and smoked, on average, more than 20 cigarettes per day at enrollment, with the exception of the study of adolescents, whose participants smoked an average of 10 cigarettes per day. Smoking data obtained from TLFB were compared to daily paper calendars (Brown et al., 1998), daily telephone reporting (Toll, Cooney, McKee, & O'Malley, 2005), and a single item global question (e.g., “how many cigarettes do you smoke per day”) (Gariti et al., 1998; Lewis-Esquerre et al., 2005).

All studies showed significant correlations between the other self-report measures of smoking and TLFB. To examine the absolute discrepancy between the methods, two studies computed difference scores between values obtained from the other self-reported method and TLFB and conducted matched t-tests to explore differences in mean values. Only a few significant differences emerged. In one study of adults, the mean cigarettes smoked per day from TLFB was higher by 1.5 cigarettes per day compared to daily reports, during one but not all time periods (Brown et al., 1998). Among the adolescent sample, the mean reports of cigarettes smoked per day for TLFB was lower by 1.4 cigarettes per day compared to the single item global question (Lewis-Esquerre et al., 2005).

None of the prior studies included non-daily smokers nor did they compare TLFB with the two-item global questions, which represent an advance over single-item measures that conflate frequency and intensity of smoking. Since self-report is the only method available to measure smoking over a 30-day period, prior studies included participants who smoked regularly every day, and the majority of young smokers and an increasing proportion of adults do not smoke every day, researchers (Lewis-Esquerre et al., 2005) have suggested that future studies should focus on comparing self-reported measures among those who smoke less frequently than every day. This paper addresses these deficiencies in the literature by comparing non-daily smokers' reports using the TLFB and the two-item global measurement systems. Drawing on categories used to examine the National College Health Risk Behavior Survey, (Douglas et al., 1997) only responses from students who report smoking on 1 to 29 days out of the past 30 days (non-daily smokers) were included.

Methods

Participants

Investigators used proactive recruitment strategies, including monetary incentives (Cronk et al., 2007, February) and lay health advisors, (Varvel, Cronk, Harris, & Scott, (in press)) to recruit undergraduate students at one large university in the Midwest. Students who were not seeking tobacco treatment were recruited based on their level of smoking (any smoking in the past 30 days), regardless of their interest in quitting smoking. Students were recruited to complete a battery of computerized assessments as part of a clinical trial focused on smoking cessation and healthy eating. Since few (63/452) reported smoking every day and the literature calls for more focus on non-daily smoking, only students who reported smoking cigarettes between 1 and 29 days out of the past 30 days were included in the current analysis. Participants completed the two assessments back-to-back on the computer. Assessments were completed by three cohorts, with the order of administration counterbalanced during the fall semesters of 2006 (n=132, TLFB first) and 2007/2008 (n=257, global questions first). Participants (n=389, 48% female, 96% white) were members of fraternity or sorority social organizations and of traditional college age (mean age=19.5, SD=1.07). Since there was high agreement between the two assessments in classifying those who smoked 1–29 days of the past 30 days, students were selected based on their responses on the TLFB interview, which yielded five fewer participants than would have been included using the global measure. The sample was further categorized based on number of days smoked using established criteria for college smokers (Douglas et al., 1997) using TLFB reports. This yielded two groups: infrequent smokers (smoked on 1–19 days) and frequent smokers (smoked on 20–29 days). As shown in Table 1, respondents on average smoked on 9 of the past 30 days, around 30–33 cigarettes in a 30-day period, and between 2 and 3 cigarettes on days they smoked.

Procedures and measures of smoking

Timeline Follow-Back Interviews—The TLFB method entails using anchoring events to prompt respondents to provide retrospective estimates of the behavior of interest (L. C. Sobell et al., 1995). In this study students completed the TLFB without direct assistance of research personnel by entering information about their smoking onto a computer in a three-step process. First, the computer displayed the immediate preceding 30-day period, calculated back from the date the assessment was taken. The 30-day period was displayed in a typical calendar month format, with holidays and school events (i.e. Homecoming) marked. Second, the computer prompted students to enter their own anchoring events (such as friends' birthdays) for each day. Third, the computer displayed an updated calendar by adding students' specific occasions to the already existing events. While the anchored calendar was displayed, the computer prompted students to enter the number of cigarettes smoked on each of the 30 days.

Two-item Global Measure—Two-item global questions from the National College Health Risk Behavior Survey (Centers for Disease Control and Prevention, 1997; Everett et al., 1999) and recent Youth Risk Behavior Surveys (National Center for Chronic Disease Prevention and Health Promotion, 2007) assessed smoking days ("*On how many of the past 30 days did you smoke cigarettes*?") and the number of cigarettes smoked on smoking days ("*During the past 30 days, on the days that you smoked, how many cigarettes did you smoke per day*").

Statistical Analyses

Separate analyses were conducted for each of three smoking variables: Total Cigarettes Smoked in 30 Days (*cigarettes*); Total Days Smoked over 30 Days (*days*); and, Average Number of Cigarettes Smoked per Day (*cigarettes per day*). Each of these three definitions of smoking was measured in two ways, TLFB and two global questions. For the *cigarettes* variable, the TLFB was the sum of the numbers of cigarettes smoked each day during the 30 day period; the global measurement was the reported average number of cigarettes per day smoked multiplied by the number of days the participant reported smoking out of the last 30 days. For the *days* variable, the TLFB measurement was the number of days in which one or more cigarettes was smoked in the 30 days; the global measurement was directly from the global question. For the *cigarettes per day* variable, the TLFB measurement was the number of cigarettes smoked over a 30-day period divided by the number of days one or more cigarettes were smoked during this period; the global measurement was directly from the global question.

Scatter plots and Pearson product-moment correlations were used to examine and summarize the relationships between measurements methods (TLFB and global). Tests were conducted to assess whether the correlation coefficients were significantly different from zero. Dependent t-tests were conducted to assess whether the means of the differences between measurement methods were equal to zero. Repeated measures analyses of variance with the factor of smoking frequency (frequent, infrequent) and repeated measure of measurement method (TLFB, global) were conducted to explore between and within subject effects. Partial Eta Squared statistics were calculated to summarize the effect sizes. Where indicated, pairs of post hoc dependent t-tests were conducted to assess the effect of measurement method among frequent and infrequent smokers; p-values for these tests were Bonferroni adjusted. In all cases, two-tailed tests were conducted at the 0.05 level of significance.

Results

Did the measurement methods yield similar findings?

Scatter plots (not included) showed some tendency toward higher values with the TLFB than global measurements. As expected, there was a high level of positive linear association between the two types of measurement methods, with all correlation coefficients $\geq .90$ (Table 1) and significantly different from zero. Comparisons of TLFB with the global questions for the total sample of non-daily smokers yielded statistically significant differences ($p<.001$), albeit small, between measures with the TLFB resulting, on average, in 2.38 more total cigarettes smoked out of the past 30 days, 0.46 less smoking days, and 0.21 more cigarettes smoked per day.

Did the relationship between measurement methods differ based on frequency of smoking?

The analysis of raw scores to determine if the pattern of concordance between the two measurement methods were similar across frequency of smoking yielded expected main effects across the three smoking variables. Between subjects differences for smoking frequency were found for all smoking variables, including total cigarettes, $F(1, 387) = 345.19$, $p<.001$, days smoked, $F(1, 387) = 707.10$, $p<.001$, and cigarettes smoked per day $F(1, 387) = 79.65$, $p<.001$. Within subject differences in measurement methods were found among the smoking frequency groups (i.e., there was a significant measurement method effect) for total cigarettes smoked,

$F(1, 387) = 46.25$, p<001, and cigarettes smoked per day, $F(1, 387) = 22.89$, p<.001, but not for days smoked, $F(1,387) = .13$, p=.719. Of particular interest, the interaction of measurement method and smoking frequency group was significant for all three smoking variables including total cigarettes $F(1, 387) = 37.32$, p<.001, days smoked, $F(1, 387) = 8.16$, p=.005, and cigarettes smoked per day $F(1, 387) = 4.34$, p<.038. This indicates that measurement method differences were inconsistent across the smoking frequency groups. For total cigarettes smoked, the interaction effect was moderate (η^2=.09); for days smoked, it was small (η^2=.02); and for cigarettes smoked per day, it also was small (η^2=.01). As shown in Table 1, for total cigarettes smoked, the mean of the differences between measurement methods was found to be significantly different from zero among frequent smokers but not among infrequent smokers; for days smoked, there was a measurement method effect among infrequent, but not frequent, smokers; and for cigarettes smoked per day there was an effect among both frequent and infrequent smokers.

Were findings influenced by the order in which the measures were presented to participants?

To assess a possible order effect, the TLFB and global questions were presented in a different order for three independent cohorts. For the three smoking variables, t-tests failed to indicate that the mean measurements for the cohorts were unequal, suggesting which instrument was presented first did not make a difference.

Did either measurement system result in digit bias?

Digit bias is a type of recall bias whereby individuals reporting on a behavior are more likely to report quantity and/or frequency in multiples of some numbers (e.g. 5, 10) relative to others. Research with smokers has demonstrated a pattern of digit bias in the recall of cigarettes smoked per day, particularly with global self-report items (Lewis-Esquerre et al., 2005). Histograms of the smoking variables were constructed separately for each measurement system (TLFB and global) and the smoking variables of days smoked and cigarettes smoked per smoking day. For days smoked, visual inspection shows apparent digit-bias in the global measurement, in multiples of 5 (Figure 1). For cigarettes smoked per smoking day, there was no apparent bias with either measurement system (data not shown).

Discussion

While there is no gold standard for measuring non-daily smoking, researchers have suggested that TLFB methods may enhance the accuracy of smokers' memory of their smoking episodes thereby reducing unintentional recall bias and increasing accuracy of reporting (Lewis-Esquerre et al., 2005; Mermelstein et al., 2002). Findings from this study suggest that the commonly used two-item global questions and the TLFB methods yield similar findings. Small but statistically significant differences suggest global questions, compared to the TLFB method, yield lower reports of total number of cigarettes smoked in the past 30 days and cigarettes smoked per smoking day for more frequent non-daily smokers. This finding is somewhat consistent with the one study with daily smokers that tested absolute differences between smoking reports from TLFB and daily logs (Brown et al., 1998). In that study daily logs were considered accurate and TLFB resulted in 1.5 more cigarettes smoked per day.

Further, in this study, global questions resulted in digit bias in reports of days smoked, but not in the number of cigarettes smoked per day. These findings are in contrast to the study of adolescent smokers, which found the global question resulted in digit bias for number of cigarettes smoked per day, but digit bias for number of days smoked was not reported (Lewis-Esquerre et al., 2005). This discrepancy may be because the study of adolescents included those who smoked more cigarettes per day providing a larger range of data, whereas in the present sample cigarettes smoked per day was generally limited to less than 10. The phenomenon of

digit bias is important to assess in order to determine its effect on concordance rates between assessment methods. It represents a source of error (i.e. recall bias) that in the present study affected global measures more profoundly than TLFB for days smoked. The evidence of digit bias for the global measures and not the TLFB, suggests the potential for increased accuracy of the TLFB relative to the 2 global items.

Overall the two measures of smoking were highly correlated and equally effective for identifying any smoking in a 30-day period. The magnitude of difference between the measurement methods was relatively small overall—around 2 cigarettes in a 30-day period, one half of one day, and less than one-quarter of a cigarette per smoking day—and very small for infrequent smokers. TLFB methods require more effort and time to complete. For example, in our study the absolute minimum number of computer keystrokes required to complete the measures was 4 for the global questions versus 60 for TLFB. Further, TLFB requires specialized computer programming or staff assistance to complete. Therefore, perhaps only rigorous studies seeking to detect relatively subtle differences, such as controlled trials targeting smoking reduction, or to characterize smoking patterns over time should consider measuring non-daily smoking using TLFB in addition to the global questions.

A number of limitations warrant mention. By design, participants were college students who might, because of their youth and focus on academics, have more accurate recall skills or other important differences from other populations. Further limiting generalization, all participants were members of Greek social groups. Additional methods of assessment, such as daily self-monitoring, would have strengthened the study.

To our knowledge, this is the only study to compare findings from TLFB and global smoking assessments among non-daily smokers, a growing group of smokers in the US, (Centers for Disease Control and Prevention, 2008; Hyland, Rezaishiraz, Bauer, Giovino, & Cummings, 2005) representing 50% of smokers in some groups (Okuyemi et al., 2002). Results suggest that, compared to TLFB, global questions commonly used in survey research slightly underestimate cigarettes smoked by non-daily smokers (especially those who smoke more frequently) and result in some digit bias in reporting the number of days smoked. For tightly controlled studies, especially those interested in detecting small changes in smoking levels, TLFB methods may be worth the extra time and effort required for their administration in order to detect subtle differences in smoking behavior among non-daily smokers.

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References

Brown RA, Burgess ES, Sales SD, Whiteley JA, Evans DM, Miller IW. Reliability and validity of a smoking timeline follow-back interview. Psychology of Addictive Behaviors 1998;12(2):101–112.

Centers for Disease Control and Prevention. Cigarette smoking among adults--United States, 2007. MMWR - Morbidity & Mortality Weekly Report 2008;57(45):1221–1226. [PubMed: 19008790]

Core Institute. Recent statistics on alcohol and other drug use on American college campuses 1999:1995–1996.

Cronk, NJ.; Davidson, MM.; Harris, KJ.; Golbeck, AL.; Catley, D.; Good, GE. Recruitment and retention of college smokers in a group randomized trial; Paper presented at the Poster presented at the 13th annual meeting of the Society for Research on Nicotine and Tobacco; 2007 Feb.

Douglas KA, Collins JL, Warren C, Kann L, Gold R, Clayton S, et al. Results from the 1995 National College Health Risk Behavior Survey. J Am Coll Health 1997;46(2):55–66. [PubMed: 9276349]

Harris, KJ.; Grobe, J.; McCarter, KS.; Nazir, N.; Gerkovich, M.; Choi, WS., et al. Smoking while in college: Baseline analysis from a longitudinal survey; Paper presented at the Eighth Annual Scientific Sessions for the Society for Research on Nicotine and Tobacco; Savannah, GA. 2002.

Hersh D, Mulgrew CL, Van Kirk J, Kranzler HR. The validity of self-reported cocaine use in two groups of cocaine abusers. J Consult Clin Psychol 1999;67(1):37–42. [PubMed: 10028207]

Hyland A, Rezaishiraz H, Bauer J, Giovino GA, Cummings KM. Characteristics of low-level smokers. Nicotine Tob Res 2005;7(3):461–468. [PubMed: 16085514]

Lewis-Esquerre JM, Colby SM, Tevyaw TO, Eaton CA, Kahler CW, Monti PM. Validation of the timeline follow-back in the assessment of adolescent smoking. Drug Alcohol Depend 2005;79(1):33–43. [PubMed: 15943942]

Menon G. The Effects of Accessibility of Information in Memory on Judgements of Behavioral Frequencies. Journal of Consumer Research 1993;20:431–440.

Mermelstein R, Colby SM, Patten CA, Prokhorov AV, Brown R, Myers M, et al. Methodological issues in measuring treatment outcome in adolescent smoking cessation studies. Nicotine & Tobacco Research 2002;4:395–403. [PubMed: 12521399]

National Center for Chronic Disease Prevention and Health Promotion. 2007 State and Local Youth Risk Behavior Survey: CDC. 2007

Okuyemi KS, Harris KJ, Scheibmeir M, Choi WS, Powell J, Ahluwalia JS. Light smokers: issues and recommendations. Nicotine Tob Res 2002;4:S103–S112. [PubMed: 12573172]

Schroder KE, Johnson CJ, Wiebe JS. Interactive Voice Response Technology applied to sexual behavior self-reports: a comparison of three methods. AIDS Behav 2007;11(2):313–323. [PubMed: 16841191]

Snyder, TD.; Dillow, SA.; Hoffman, CM. Digest of Education Statistics 2006. Washington, DC: U.S. Government Printing Office; 2007.

Sobell, LC.; Maisto, SA.; Sobell, MB. Alcohol Timeline Followback Users' Manual. Toronto: Addiction Research Foundation; 1995.

Sobell LC, Sobell MB. Validity of self-reports in three populations of alcoholics. J Consult Clin Psychol 1978;46(5):901–907. [PubMed: 701569]

Sobell MB, Sobell LC, Klajner F, Pavan D, Basian E. The reliability of a timeline method for assessing normal drinker college students' recent drinking history: utility for alcohol research. Addict Behav 1986;11(2):149–161. [PubMed: 3739800]

Substance Abuse and Mental Health Services Administration. Results from the 2006 National Survey on Drug Use and Health: National Findings. Rockville, MD: 2007.

Toll BA, Cooney NL, McKee SA, O'Malley SS. Do daily interactive voice response reports of smoking behavior correspond with retrospective reports? Psychol Addict Behav 2005;19(3):291–295. [PubMed: 16187808]

U.S. Dept. of Health and Human Services. Preventing tobacco use among young people: a report of the Surgeon General (Repr., with corrections, July 1994. ed.). Atlanta, GA: U.S. Dept. of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; 1994.

Varvel SJ, Cronk NJ, Harris KJ, Scott AB. Adaptation of a lay health advisor model as a recruitment and retention strategy in a clinical trial of college student smokers. Health Promotion Practice. (in press).

Wechsler H, Rigotti NA, Gledhill-Hoyt J, Lee H. Increased levels of cigarette use among college students: A cause for national concern. Journal of the American Medical Association 1998;280(19):1673–1678. [PubMed: 9831998]

Wetter DW, Kenford SL, Welsch SK, Smith SS, Fouladi RT, Fiore MC, et al. Prevalence and predictors of transitions in smoking behavior among college students. Health Psychology 2004;23(2):168–177. [PubMed: 15008662]

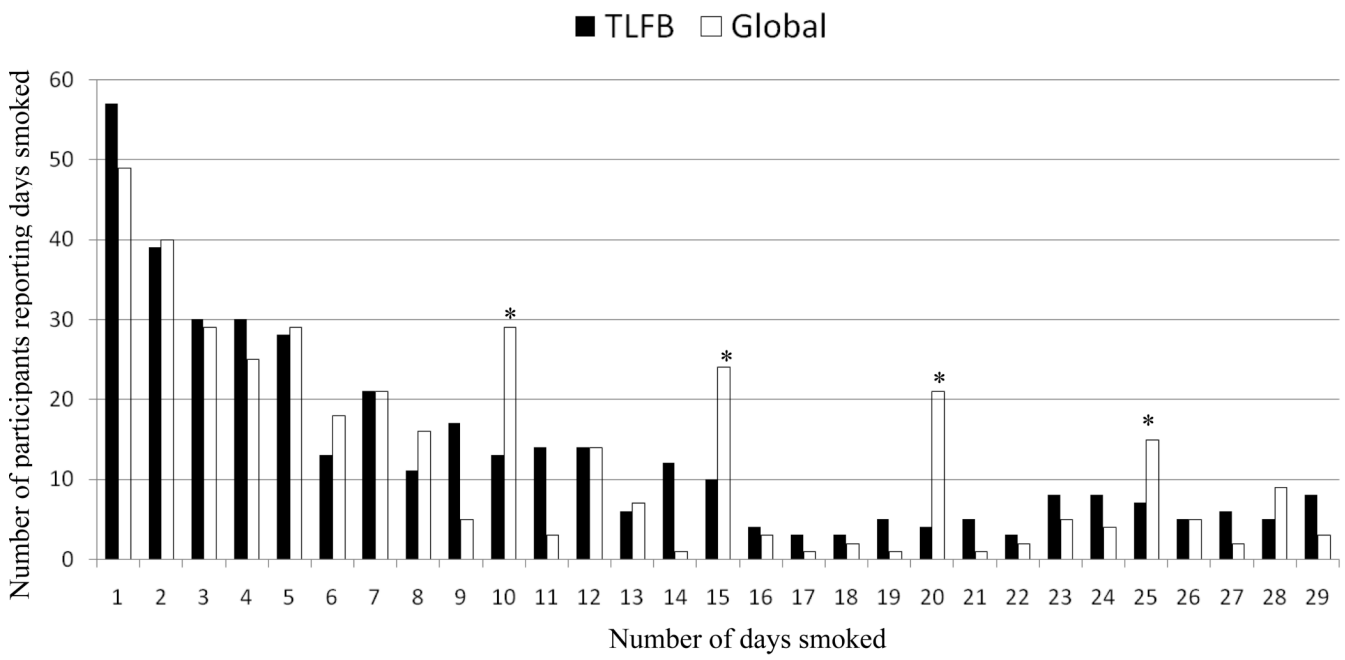

Figure 1.
Histograms of the days smoked in the past 30 days collected using TLFB and the global question. Asterisks indicate days that are multiples of five (10, 15, 20 and 25 days) and the source of apparent digit bias

Table 1

Comparison of measurement method for all non-daily smokers and by frequency of smoking for each smoking variable

Smoking Variable Method		Non-daily Smokers (n=389)		Frequency of Smoking			
				Frequent (n=59)		Infrequent (n=330)	
	ρ[a]	Mean	SD	Mean[b]	SD	Mean[b]	SD
Total cigarettes	.96						
TLFB		32.79	51.80	118.10	76.10	17.54	24.61
Global		30.41	48.34	106.05	74.02	16.89	24.09
Difference		2.38***	13.81	12.05**	26.63	.65	8.96
Days smoked	.94						
TLFB		9.07	8.09	24.85	2.78	6.25	4.82
Global		9.53	8.27	24.36	4.35	6.88	5.55
Difference		−.46***	2.81	.49	3.33	−.63***	2.68
Cigarettes per day	.90						
TLFB		2.67	2.09	4.70	2.87	2.30	1.67
Global		2.45	1.94	4.25	2.70	2.13	1.58
Difference		.21***	.92	.45***	.87	.17***	.92

[a] Pearson product moment correlation coefficients.

[b] Post-hoc Bonferroni adjusted p-values.

* $p < .05$.

** $p < .01$.

*** $p \leq .001$.