Examining protocol compliance and self-report congruence between daily diaries and event-contingent ecological momentary assessments of college student drinking

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Abstract

Background: Daily diaries and ecological momentary assessments (EMA) are frequently used to assess event-level college student drinking. While both methods have advantages, they also raise questions about data validity, particularly in regard to alcohol's impact on protocol compliance. The current study examined congruence in drinking behaviors reported via retrospective daily diaries and event-contingent drinking logs, protocol compliance with each method, and the extent to which alcohol consumption impacted compliance.

Methods: Participants were first-semester college women (n = 69) who reported 4+ drinks during an occasion at least once in the past month. Participants reported the number of drinks consumed and subjective intoxication using a 14-day EMA protocol. Event-contingent drinking logs (via self-initiated EMA) assessed behavior immediately after each drinking event; daily diaries assessed behaviors from the previous day. Pairwise correlations examined congruence between drinking logs and corresponding daily dairies; protocol compliance was examined through descriptive analysis of data missingness; and multilevel regression models assessed the associations between protocol compliance, alcohol consumption, and subjective intoxication.

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Results: Drinking log and daily diary reports were highly correlated (r's = 0.70 to 0.93). On drinking days, diary reports had higher protocol compliance (96.0%) compared to momentary drinking logs (41.4%). Drinking log missingness was associated with greater alcohol use and subjective intoxication reported in the corresponding daily diary (p's < 0.05).

Conclusions: Similarities in reports of alcohol consumption and subjective intoxication, coupled with higher missingness of momentary assessments suggest daily diaries may have methodological advantages and unique utility in supplementing momentary assessments.

Keywords

Event-level; Alcohol use; College students; Event-contingent ecological momentary; assessment; Daily diary

1. Introduction

Utilizing event-level methodologies to assess college student alcohol use has become increasingly common (e.g., Dvorak et al., 2018; Riordan, Flett, Hunter, Scarf, & Conner, 2018). These methodologies include passive sensors, daily diaries, and ecological momentary assessments (EMA) with event-, signal-, or location-contingent responses. While research has compared self-report to sensor data (e.g., Simons, Wills, Emery, & Marks, 2015), sensors can be costly, unwieldly, and devices and data may be unreliable (Greenfield, Bond, and Kerr, 2014; Roache et al., 2015). Limited research has compared alcohol measures assessed using different participant-initiated event-level methods (e.g., daily diaries and momentary drinking logs) within the same sample (Monk, Heim, Qureshi, & Price, 2015; Tidey et al., 2008). Comparisons of alcohol measures within event-contingent EMA and daily diaries may provide researchers with information on the boundaries of EMA monitoring (Piasecki, 2019), offering guidance on ideal timing, frequency, or incentives for effective event-level data collection or intervention. The current study compared retrospective daily diaries and event-contingent momentary drinking logs (both self-initiated event-level methodologies) regarding congruence in reported alcohol use and subjective intoxication, protocol compliance, and the extent to which alcohol use impacted protocol compliance in each methodology.

1.1. Benefits and limitations of daily diaries and event-contingent EMA

Compared to traditional retrospective accounts, daily diaries have shorter recall periods, thus reducing recall biases (Gmel & Daeppen, 2007). Daily diaries can assess behaviors that may change day-to-day, such as college student alcohol use which mostly occurs Thursdays through Saturdays, and can vary between and within students (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Maggs, Williams, & Lee, 2011). While completion rates are generally high, there are concerns about accuracy and compliance of daily diaries for individuals who were intoxicated the previous day (Palmer et al., 2019). For example, high blood alcohol concentrations (BACs) can lead to blackouts or temporary memory impairments (White, 2003), increasing difficulty in accurate recall. High BACs can also lead to disruptive sleep and next day dehydration, nausea, vomiting (Palmer et al., 2019), which may impact an individual's decision or ability to complete a daily diary.

EMAs that include event-contingent drinking logs (i.e., self-initiated repeated assessments while drinking) have unique strengths over daily diaries. The collection of drinking logs in real-time (or near real-time) almost eliminates the issue of recall bias and provides ecologically valid information, as behavior is assessed in the context it occurs. Assessments are brief, allowing for frequent repeated assessment of short-term dynamic changes in behavior (e.g., drinking behaviors and factors that influence or result from drinking that day; Shiffman, 2009).

Potential limitations of event-contingent EMA remain. First, more assessments may increase participant burden and costs of data collection and reimbursement. Second, as intoxication increases, participants may be less willing or able to complete in-the-moment assessments. Acute increases in BAC can lead to decreased cognitive processing speed (Dry, Burns, Nettelbeck, Farquharson, & White, 2012) and increased attention to momentary reward cues (Schacht, Anton, & Myrick, 2013; Steele & Josephs, 1990). Intoxicated individuals may be less likely to complete EMA due to impaired cognitive functioning and competing demands on attention. These challenges may be particularly salient for event-contingent EMA that require participants to initiate surveys while drinking. Given the advantages and limitations of utilizing daily diaries and event-contingent EMA, more research comparing these two methods is needed to assess the congruence on alcohol measures and how alcohol use may impact these reports.

1.2. Assessment congruence & protocol compliance

An enhanced understanding of the benefits and limitations of daily diaries and event-contingent EMA in alcohol research can be obtained by comparing these methodologies within the same sample. Monk and colleagues (2015) compared momentary drinking logs to daily retrospective accounts; reports were moderately correlated, but drinks consumed were higher in the momentary logs relative to daily diaries. One study of heavy drinkers used momentary drinking logs and daily diaries to assess changes in drinking and craving when given Naltrexone or a placebo (Tidey et al., 2008). This study did not compare drinking amounts or intoxication, but it reported 3.9% of daily diaries were missing a drinking log from the previous day. To our knowledge, no studies have directly compared protocol compliance (i.e., missingness) between daily diaries and momentary drinking logs or the extent to which alcohol consumption may impact compliance. Further, while research suggests individuals differ in sensitivity to alcohol's effects (Ray and Hutchison, 2004), no studies have compared levels of subjective intoxication reported in these two methodologies or whether subjective intoxication is associated with assessment compliance.

1.3. Current study

The current study expands the literature by examining both daily diaries and event-contingent momentary drinking logs within a sample of first semester college women drinkers. While historically men drink more than women, the gap between college men's and women's drinking is shrinking (Grant et al., 2017; White et al., 2015). Drinking tends to increase as students approach legal drinking age (Schulenberg et al., 2019); however, drinking habits observed in the first semester can predict future drinking (Hultgren et al., 2019). First-semester women are at increased risk for severe alcohol-related consequences,

especially on days when they drink more than usual (Neal & Fromme, 2007; Scaglione et al., 2014), suggesting they may benefit from targeted intervention. More research is needed to understand compliance with and congruence across event-level data collection methods for women during this at-risk period. Aim 1 assessed how daily diaries corresponded with momentary drinking logs of alcohol consumption and subjective intoxication. Based on a similar comparison (Monk et al., 2015), we hypothesized these reports would be correlated, but the reported number of drinks consumed would be higher in momentary drinking logs. We expected subjective intoxication would be lower in momentary drinking logs compared to daily diary reports due to alcohol's stimulatory effects as BAC rises, the negative effects of hangovers the following day, (Martin, Earleywine, Musty, Perrine, & Swift, 1993), and because participants may not complete momentary drinking logs when they are at peak intoxication. Aim 2 examined protocol compliance in both methodologies. Since past research suggests high compliance among college students for daily diaries (Ray, Stapleton, Turrisi, & Mun, 2014; Sell, Turrisi, Scaglione, Cleveland, & Mallett, 2018), and given alcohol's acute effect on cognitive and attentional demands, we expected higher compliance for daily diaries relative to momentary drinking logs. Aim 3 assessed whether alcohol consumption or subjective intoxication influenced protocol compliance. We hypothesized greater alcohol consumption and subjective intoxication reported in momentary drinking logs would be associated with missingness in the next day's diary assessment, and missingness in momentary drinking logs would be associated with higher number of drinks and subjective intoxication reported in subsequent daily diaries.

2. Materials and methods

2.1. Recruitment

A random sample of 750 incoming women at a public northeastern university were invited to an online screening survey. Approximately 58% (n = 436) completed screening, and 54% of those students (n = 235) met eligibility criteria (a 4G network smartphone and 4 drinks at least once in the past month). Ineligible students were paid $5; eligible students were directed to a baseline assessment and paid $15, with a $5 bonus for completing within 3 days. Baseline completion among eligible students was 100%. Two-thirds (n = 156) were randomly assigned to the current study; remaining students (n = 79) were assigned to a separate study. Approximately 54% (n = 84) of those invited, or 19% of all screened participants, enrolled in and attended training for the study. Relative to eligible participants who did not enroll in the current study, enrolled participants did not significantly differ on age, race/ethnicity, or baseline drinking behaviors (all p's > 0.05).

2.2. Event-level procedures

Participants attended an in-person training on the mobile data collection application (Snap Mobile) and study protocol, including how to measure and count standardized drinks using NIAAA's definition and graphic images (NIAAA, 2006). Participants were trained to initiate surveys upon waking each morning and at the end of each drinking event for 14 days. A "drinking event" was defined as any period of time the participant consumed alcohol, and participants were instructed to initiate a new drinking log each time they changed drinking environments (e.g., tailgate, party, late night) or peer groups. All

participants completed a trial survey and a procedural knowledge test that included identifying drinking events and when to complete surveys. Answers were reviewed with study staff; incorrect answers were discussed.

Text message reminders were sent at 9:00 am on weekdays/10:00am on weekends, and again at 12:30 pm for daily diaries (the survey closed at 1:00 pm daily), and at 10:00 pm on Thursday, Friday, and Saturday nights for drinking logs. Participants received $30, with a $20 bonus for completing 12 daily diaries. Participants received entries to a lottery for each survey they completed, with increased entries based on the required effort to remember initiation (e.g., 2 entries for initial drinking log; 5 entries for additional drinking logs). Five random lottery winners received prizes between $50 and $250. Procedures were approved by the university's Institutional Review Board.

2.3. Participants

Individuals who reported at least one drinking event in the momentary drinking logs or daily diaries were included in analyses (n = 69). Thirteen participants completed study procedures but did not report any drinking. All 69 participants who drank reported 1 drinking event via daily diaries; 64 also reported drinking via momentary drinking logs. The mean age was 18.06 years ($SD = 0.24$). The majority were Caucasian (84.1%; 8.7% African American, 4.3% multiracial; 4.3% Hispanic). At baseline, participants reported consuming 8.49 ($SD = 5.72$) drinks per week.

2.4. Drinking behavior measures

2.4.1. Momentary drinking logs—At the end of each drinking event, participants self-initiated a drinking log and reported how many drinks they consumed during that event. Responses ranged from less than one drink to 11 or more drinks. This question was followed by, "How intoxicated would you say you are right now?" Response options ranged from "completely sober" (1) to "extremely drunk" (7). These questions were repeated each time a participant changed location, moved between peer groups, or stopped drinking.

2.4.2. Daily diaries—Each morning, participants reported whether they consumed alcohol on the previous day. If yes, they reported how many drinks (range: 0 to 11 +); level of intoxication ("How intoxicated would you say you were?", response range: "completely sober" (1) to "extremely drunk" (7)); and the number of drinking events in which they engaged.

2.5. Analytic strategy

2.5.1. Congruence between daily diaries and momentary drinking logs— Pairwise correlations between reports in momentary drinking logs and the subsequent daily diaries were examined using two methods of within-day aggregation. First, the total number of drinks consumed in a day was created by summing the reported drinks in all momentary drinking logs within a day. Scores > 11 were recoded as "11 or more" to be on the same scale as daily diaries. Second, participants' maximum levels of subjective intoxication across momentary drinking logs within a day were utilized for bivariate comparisons. Correlations were assessed separately by weekends (Thursday-Saturday) and weekdays (Sunday-

Wednesday) for days that participants completed both a daily diary and at least one drinking log. Mixed effects Poisson and linear regression models assessed differences between daily diaries and momentary logs.

2.5.2.   Assessing protocol compliance—To determine differences in compliance between daily diaries and momentary drinking logs, each assessment was dummy coded on completion (1 = Missing, 0 = Complete). Missingness within drinking logs was determined by comparing the number of completed drinking logs to the number of drinking events participants reported in their daily diaries the following morning. Participants were considered to be fully compliant if these values matched, with compliance assessed for each day on which drinking occurred. An occurrence was partially compliant if a participant completed at least one drinking log, but completed fewer logs than the number of drinking events reported in the respective daily diary. Lastly, if a participant did not complete any drinking logs for a day but reported drinking in the respective daily diary, then the occasion was considered to have no drinking log compliance. Descriptive cross-tabulations were used to examine overall missingness, determine missingness patterns, and compare number of drinking events for each assessment type.

2.5.3.   Protocol compliance as a function of alcohol consumption and subjective intoxication—A series of three multilevel regression models were fit using Stata 16 to examine the effects of drinking on both event-contingent momentary and daily assessment compliance. Stata 16 utilizes a maximum likelihood approach with robust standard errors to handle missing data. Unconditional means models confirmed the necessity of a multilevel approach. To control for differences on weekdays versus weekends, we included a dichotomous covariate indicating the day of the week (1 = Thursday-Saturday, 0 = Sunday-Wednesday) in all models.

The first model examined whether drinking behaviors reported in the momentary drinking logs predicted missingness (i.e., not completing) of daily diary assessment the following morning. Number of drinks consumed and maximum subjective intoxication were person-mean centered and included as Level-1 predictors. These measures were also averaged across participants' drinking days, group-mean centered, and added as Level-2 covariates to control for individual-level drinking behaviors.

The second and third models assessed associations between participant compliance with momentary logs and drinking behavior reported in the corresponding daily diary. First, Poisson regression assessed the relationship between momentary compliance and drinks consumed. Next, linear regression with a maximum-likelihood estimator assessed the association between momentary compliance and daily diary reports of subjective intoxication. A Level-1 categorical variable was included to indicate participants' completion of drinking logs for each drinking event (0 = full compliance, 1 = partial compliance, 2 = no compliance, based on the definitions provided above). This variable was coded such that full compliance served as the reference group, with higher values indicating more missingness. This measure of missingness was averaged across each participant's drinking days and analyzed as a Level-2 covariate.

3. Results

Correlations between daily diaries and momentary drinking logs are in Table 1. Measures of alcohol consumption and subjective intoxication were highly correlated. On drinking days, participants reported consuming an average of 5.10 ($SD = 2.51$) drinks via daily diaries and 4.71 ($SD = 2.67$) drinks via momentary drinking logs. Controlling for weekday vs. weekend drinking, these reports were not significantly different (IRR = 0.98, 95% CI = 0.71, 1.34)). Reports of subjective intoxication were higher in daily diaries ($M = 4.30$; $SD = 1.51$) than momentary drinking logs ($M = 3.72$; $SD = 1.60$), but this difference was not significant after controlling for weekday vs. weekend drinking (b = −0.11, SE = 0.29, p = 0.71). We further examined the possible cross-level interaction effect of day and survey type but this interaction was not significant (p = 0.32).

The number of possible observations and percent complete are provided in Fig. 1. Overall, there was more missingness within momentary drinking logs than daily diaries. Within daily diaries, a total of 215 drinking days and 339 drinking events were reported. Drinking logs captured 135 drinking days and 174 drinking events. A total of 6.6% days were missing a daily diary and approximately 5% of days were missing both a daily diary and drinking log. Among the 399 drinking events reported in daily diaries, 41.4% were missing a drinking log. Students reported 1–7 drinking days ($M = 3.12$; $SD = 1.60$) via daily diaries and 1–6 drinking days ($M = 2.23$; $SD = 1.30$) via drinking logs. On days they drank, students reported 1–4 drinking events ($M = 1.58$, $SD = 0.82$) via daily diaries and 0–3 drinking events ($M = 1.20$, $SD = 0.37$) via drinking logs.

Controlling for person-level effects and day of the week, the completion of a daily diary the morning after drinking was not associated with the number of drinks or subjective intoxication reported in momentary drinking logs (OR = 0.93, 95% CI = 0.50, 1.75 and OR = 1.21, 95% CI = 0.42, 3.44, respectively; Table 2). Analyses examining the association between daily diary drinking and protocol compliance of momentary drinking logs indicated occasions of non-compliance (i.e., no drinking logs) or partial compliance (i.e., completion of logs for some but not all drinking events within a night) were associated with increased drinking reported in daily diaries. Compared to days with complete drinking log compliance, when participants recorded no drinking logs they consumed 24% more drinks (IRR = 1.24, 95% CI = 1.04, 1.48), and reported greater subjective intoxication (b = 0.67, $SE = 0.29$, $p < 0.01$) within daily diaries. Similarly, on days with partial drinking log compliance, daily diaries indicated participants consumed 35% more drinks (IRR = 1.35, 95% CI = 1.11, 1.65) and reported greater intoxication (b = 0.93, $SE = 0.29$, $p < 0.01$) compared to days of full drinking log compliance.

4. Discussion

The current study examined congruence in drinking behaviors assessed in daily diaries and event-contingent momentary drinking logs in a sample of first-semester college women drinkers. In partial support of Aim 1 hypotheses, daily diaries and drinking logs were significantly correlated, with the strongest associations during weekdays. Students tend to drink more on weekends (Maggs et al., 2011), and this difference suggests weekend

assessments may be influenced by recall bias or effects of intoxication. There was no significant difference between momentary drinking logs and daily diaries on the number of drinks consumed. This is inconsistent with previous findings from Monk et al. (2015) suggesting drinking logs would be higher than daily diaries, perhaps due to design differences. Monk et al. (2015) utilized a mobile application that, following participant initiation of a drinking log, provided a follow-up prompt every hour until participants reported they stopped drinking. Additional studies are needed to determine if differences are due to study design or other factors such as having a sufficient number of drinking days per participant for comparisons. Reports of subjective intoxication in daily diaries were higher than drinking logs, but this difference was not significant after controlling for the effect of weekday vs weekend. These findings were counter to our hypothesis that subjective intoxication reported in daily diaries would be higher because they encompass a reflection of the whole drinking day and momentary drinking logs provide an in-the-moment report that may be influenced by stimulatory effects associated with BAC ascension (Martin et al., 1993). Findings suggest either assessment type could be effective for estimating alcohol consumption and peak subjective intoxication.

Aim 2 examined protocol compliance. Supporting our hypothesis, higher protocol compliance was observed for daily diaries relative to momentary drinking logs. This may be due to alcohol's effects on attention and cognition in the moment (Dry et al., 2012; Schacht et al., 2013). An alternate explanation could be that determining a change in drinking event may have been challenging for participants. However, we feel this possibility is mitigated by participants' demonstrated ability to identify drinking events in the post-training knowledge test and because participants were able to report the number of drinking events that occurred the night before via their daily diaries. Study design, specifically reminders and incentives, may have also had an effect. Even though students received reminder texts for both methods, drinking logs were not reported daily and initiation may have been harder to remember. Further, participants received a bonus for completing 90% of diary assessments, whereas drinking logs were incentivized through lottery entries. This decision was intentional to avoid inadvertently rewarding drinking events. Utilization of techno-logical advances, such as automated reminders after drinking starts, may improve event-contingent momentary compliance. Alternative incentive structures that encourage compliance without monetarily reinforcing drinking should also be explored.

Finally, examination of Aim 3 revealed greater alcohol consumption and subjective intoxication in drinking logs were not associated with missingness in the next day's diary assessments. This is unsurprising given the high completion rates of diaries. Missingness in drinking logs was associated with increased drinks and subjective intoxication reported the following morning, indicating students may be less likely to complete either some or all momentary assessments when drinking more than they typically do. Since a new drinking log was required after every change in location or peer group, this may indicate students who have multiple contextual changes while drinking are at risk for not completing momentary assessments. Different EMA designs, such as signal-contingent, should be examined for differences in compliance to assess the association of both the amount of drinking and contextual changes with reduced compliance.

4.1. Implications for research & prevention

As one of the first studies to compare alcohol-related measures in daily diaries and event-contingent drinking logs in a sample of college women, findings have several implications for future research and prevention. When matching study design to event-level research questions about drinking, researchers should determine whether event-contingent momentary assessments (i.e., EMA) are necessary. EMA is particularly useful for assessing changes in intoxication within a night (e.g., outcomes associated with different points on the BAC curve; Trela, Piasecki, Bartholow, Heath, & Sher, 2016) or dynamic contextual factors that impact drinking behavior. However, daily diaries might be preferred if the main outcome is amount consumed or maximum subjective intoxication, as protocol compliance is significantly higher for daily diaries and reports of drinks consumed and intoxication do not significantly differ. EMA studies utilizing event-contingent drinking logs should plan to address missingness analytically or to minimize missingness using event-triggered reminders or graduated incentive structures that do not reinforce risky behavior.

Event-level interventions are increasingly common in college student drinking (Kazemi et al., 2018; Wright et al., 2018); however, few studies focus on first-year women. The current study indicates women who were partially compliant or non-compliant with completing drinking logs reported greater consumption and intoxication the next morning. It is possible reduced compliance with event-contingent drinking logs may translate to reduced attention to momentary intervention messages during a drinking event. Thus, event-level interventions aimed at this population may be most effective leading up to a drinking event.

4.2. Limitations and future directions

The study included only first semester women from one university and therefore findings may not generalizable to different populations, including males and older students. Some research suggests women are more likely to participate in research and comply with study protocols (Sax, Gilmartin, & Bryant, 2003). Therefore, assessments should be replicated in diverse groups to examine potential differences. The end of a drinking event, as described in the current study, might be difficult for some individuals to define. This highlights the benefit of using both drinking logs and daily diaries to cross check drinking reports. The current study compared two types of participant-initiated event-level data collection methods. Findings should not be generalized to other types of EMA without replication, as compliance may differ for passive or signal-contingent methods. Future work should examine the optimal timing and combination of signal- and event-contingent EMA and incentive structures for minimizing missingness. Finally, utilizing bio-sensor data may minimize reliance on participant memory and attention and would further elucidate current findings; however, these devices have their own limitations which should be considered.

4.3. Conclusion

When assessing alcohol behaviors in college student women, acute alcohol use and intoxication may lead to lower compliance in event-contingent EMA. Daily diaries may be more beneficial than momentary drinking logs when assessing daily alcohol consumption and maximum subjective intoxication. Future research should assess reports and compliance

among varied EMA and daily diary study designs, including different reminder and incentive structures.

Acknowledgement

The authors would like to thank Ms. Sarah Ackerman who assisted in editing this manuscript.

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HIGHLIGHTS

• A Alcohol use and intoxication were similar in event-contingent EMA and daily diaries.

• Daily diaries had higher compliance than event-contingent EMA on drinking days.

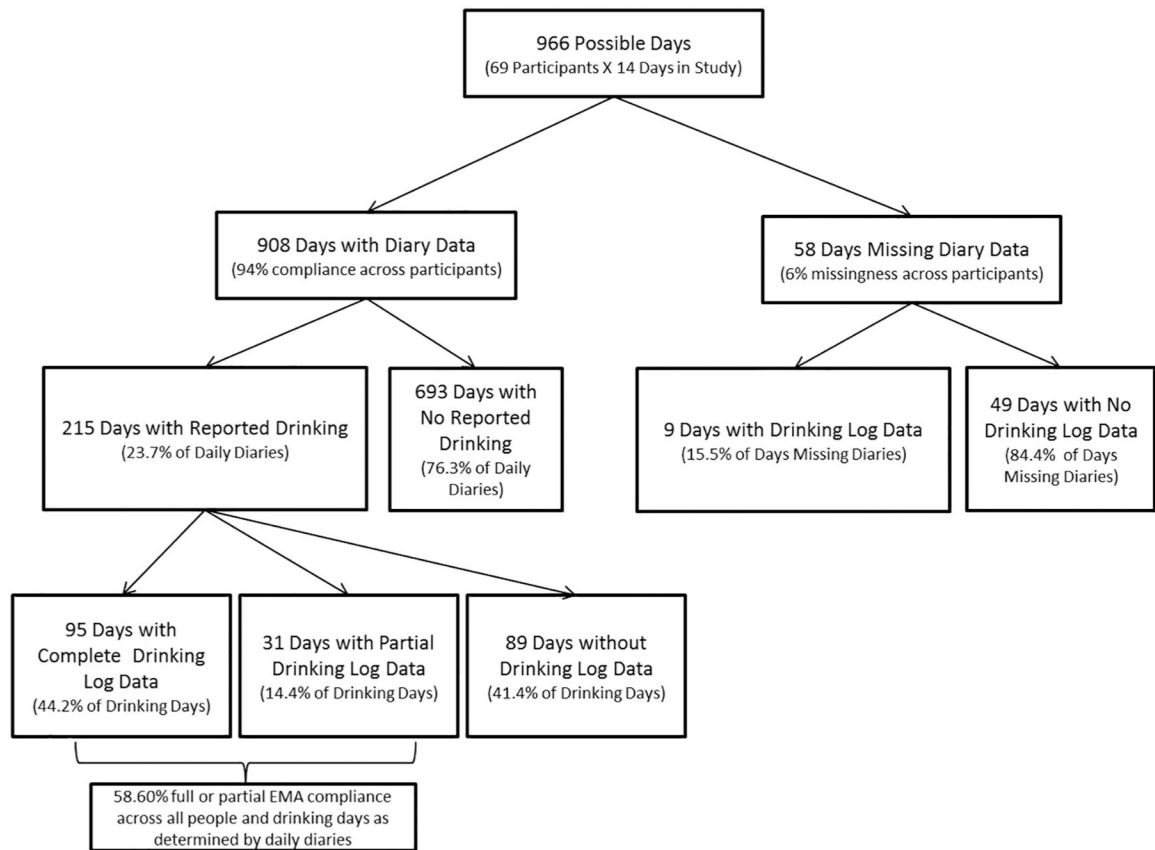• Missing EMA associated with higher alcohol use and intoxication reported in daily diaries

Fig. 1.
Protocol Compliance for Daily Diary and Momentary Drinking Logs.

Table 1

Bivariate Correlations between Momentary Drinking Logs and Daily Diaries.

Momentary Drinking Log Variables	Daily Diary Variables			
	Weekday Drinks	Weekend Day Drinks	Weekday Intoxication	Weekend Day Intoxication
Weekday Drinks	0.929*** (N = 13)			
Weekend Day Drinks		0.700*** (N = 113)		
Weekday Intoxication			0.790** (N = 13)	
Weekend Day Intoxication				0.713*** (N = 113)

Note:

*** $p < 0.001$, Weekdays include Sunday-Wednesday, Weekend days include Thursday-Saturday

Note: Correlations only include days where both a daily diary and at least one drinking log were completed.

Table 2

Multilevel Regression Model Estimates.

	Multilevel Logistic Regression on Daily Diary Missingness (N = 137)			Multilevel Poisson Model on Alcohol Consumption Reported in Daily Diaries (N = 215)			Multilevel Linear Regression on Subjective Intoxication Reported in Daily Diaries (N = 215)		
	OR	SE	P	IRR	SE	P	B	SE	P
Event-level Fixed Effects									
Day of Week Weekday	REF	REF	REF	REF	REF	REF	REF	REF	REF
Weekend	0.145	0.156	0.065	1.432*	0.168	0.002	0.633*	0.289	0.029
Drinks Reported in Corresponding EMA	0.934	0.300	0.831	—	—	—	—	—	—
Max. Intoxication Reported in Corresponding EMA	1.206	0.645	0.727	—	—	—	—	—	—
EMA Compliance Full Compliance	—	—	—	REF	REF	REF	REF	REF	REF
Partial Compliance	—	—	—	1.352*	0.136	0.003	0.931*	0.294	0.002
No Compliance	—_	—	—	1.238*	0.113	0.019	0.672*	0.251	0.007
Fixed Intercept	0.205	0.170	0.057	3.030*	0.393	< 0.001	3.252	0.321	<0.001
Participant-level Random Effects									
Average Drinks Reported in EMA	1.219	0.288	0.402	—	—	—	—	—	—
Average Max. Subjective Intoxication Reported in EMA	0.368*	0.170	0.029	—	—	—	—	—	—
Average EMA Compliance	—	—	—	0.894	0.074	0.174	−0.353	0.230	0.125
Random Effect Variance	0.235	1.786	—	0.070	0.023	—	0.568	0.191	—

Note:

*
p < 0.05.

Note: Event-level drinks and maximum subjective intoxication were centered at the means for each participant. Participant-level averages of the number of drinks consumed, maximum subjective intoxication, and EMA compliance were centered at the overall average among all participants.