

An Implementation of Contingency Features to Deliver Random EMA Surveys in a Smartphone Application

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Background

Consuming alcohol leads to risky sexual encounters. Alcohol focuses attention on immediate aspects of a situation, while it lowers attention to consequences, such as exposure to sexually transmitted infections. Mechanisms linking alcohol use and sex risk generally have been investigated in controlled settings of limited alcohol consumption and using behavior analogs. Multiple constructs have rarely been measured in the same investigation. There are so many facets to understand how alcohol decreases sexual protection that the necessary surveys can be burdensome. Measuring actual alcohol use and cues at the time they happen will be shorter and more effective than scheduled surveys. To minimize participant we developed means to suppress scheduled general surveys when participants were clearly engaged in a survey.

Methods

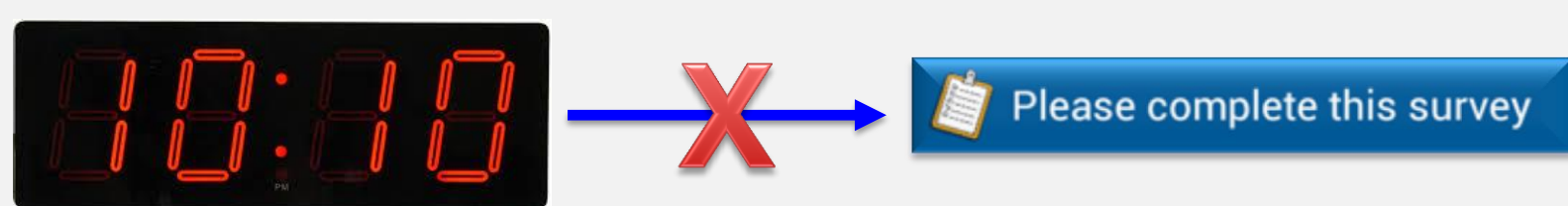
Ecological momentary assessment (EMA) records cognitions, affective experiences, and behaviors proximal to when they occur. For this study we developed a smartphone EMA app to investigate cognitive and affective processes relating alcohol use and sexual behaviors among adults at risk for sexually transmitted infection. The app captured alcohol use, sexual activity, and putative mediators by asking participants to self-identify these events and by delivering six surveys per day on a randomized schedule. After drinking alcohol participants were prompted to submit a brief report through the app.

Eligible participants reported one or more episodes of alcohol use and sex without a condom in the past month or met two other past-month criteria: (1) four or more heavy drinking episodes; (2) four or more episodes of sexual intercourse with alcohol; (3) one or more episodes of sex without a condom. Participants carried a smartphone for two weeks and provided three types of reports through the app: (1) Self-initiated survey on substance use and sexual encounters made as soon as possible when they drank alcohol, used drugs or had a sexual encounter; (2) Random surveys containing 19 items measuring affect, cognitions and sexual interests; (3) Scheduled night and morning reports on behaviors possibly missed by other reports.

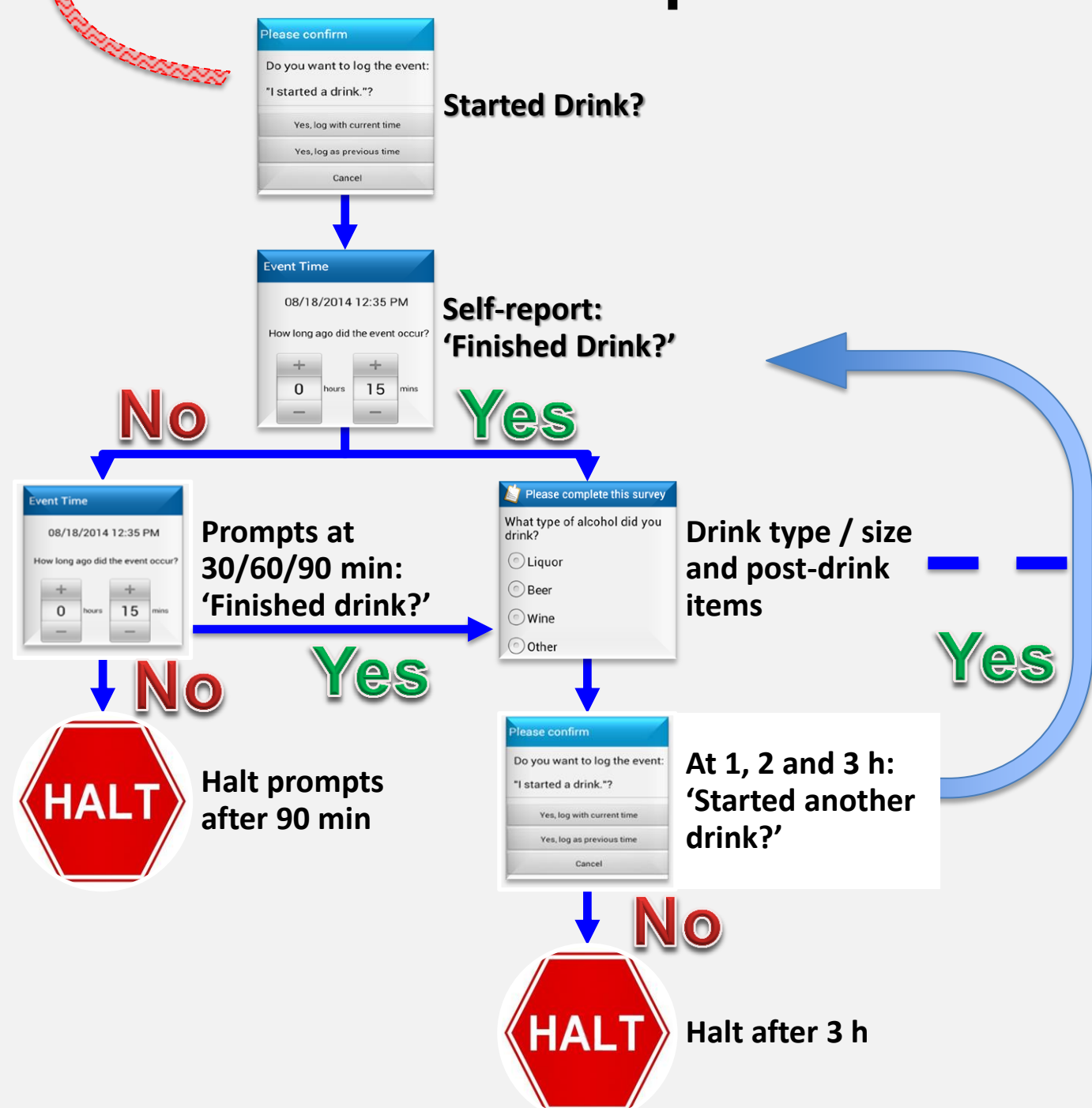
Two “context contingency” features were created to minimize participant burden and to ensure that random surveys, which are designed to measure processes outside of drinking episodes, were not delivered during a drinking episode. The contingencies (1) suppressed the random surveys for 3 h after self reports of alcohol consumption, and (2) delivered follow-up messages every 30 min after the start or end of an alcoholic drink, requesting that the participant indicate whether he/she had finished or started another drink, respectively.

Scheduled Reports

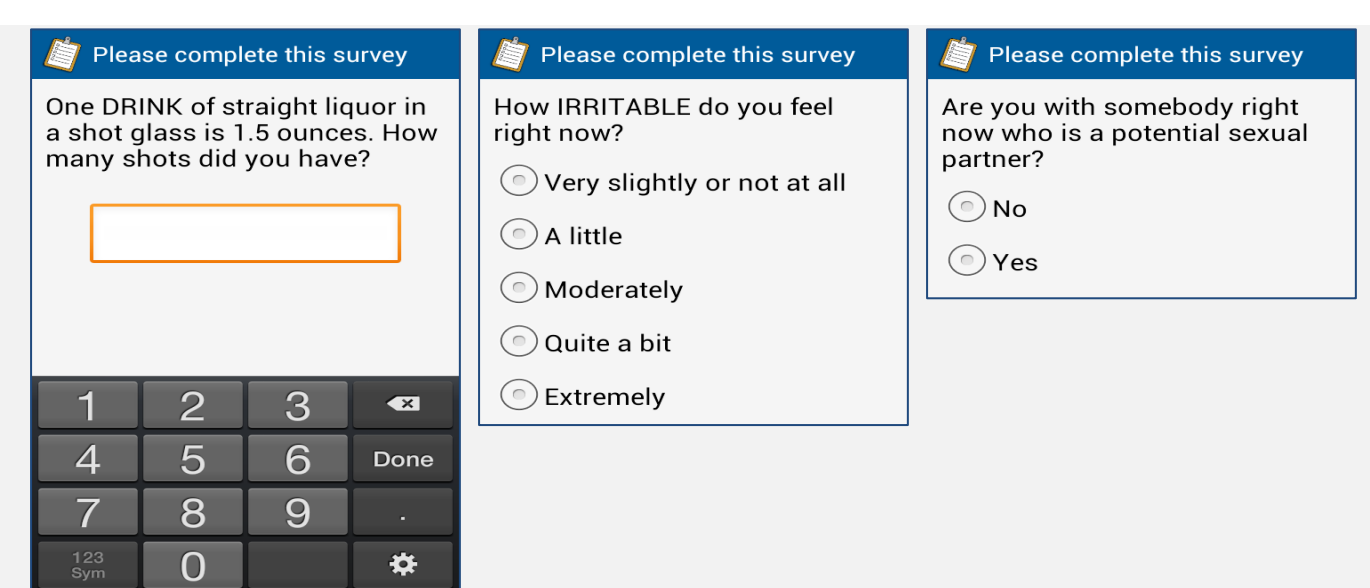
Daily surveys: morning and six random times. Blocked by Self Report



Flow of Self Reports



Drink Size and Post Drink Items



Results

Twenty seven (27) participants have completed the two-week study period. They were eligible for 2,268 random surveys (27 subjects x 14 days x 6 per day). 186 (8%) scheduled surveys were considered contingent and were withheld because self-reports of drinking had been made recently. All but two participants had at least one survey withheld. The mean number of withheld surveys was 6.9 – about one every other day. Participants self-reported starting 321 drinks, and finishing 311. Of the drink finish reports, 31% were provided after a prompt from a follow-up message. For all contingent messages, including those asking whether a new drink was started, participants responded to 504 out of 1,053 (48%) prompts.

Conclusions

Automated EMA for drinking episodes collected timely alcoholic drink reports and minimized participant recall bias. Contingency features incorporated into the EMA reduced participant burden by blocking prompts that were inappropriate for participants who had answered already, were refractory to further surveys or unable to respond. When used in an EMA application, these features may facilitate better remote measurement of alcohol use.

Acknowledgement, Disclaimer and Contact

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