

## **Statistical Analysis Plan**

Personalized Feedback After Alcohol Health Education for Members of Greek Life (GREEK  
Study)

NCT05107284

July 7, 2022

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Prior to hypothesis testing, the data will be examined for normality and outliers. Histograms and values for skewness and kurtosis will be examined. Positively skewed variables will be natural log transformed, unless paired with an excessive number of zeroes. If there are an excess of zeroes in an outcome, the variable will be dichotomized if other values are not well represented, or appropriate modeling techniques will be used (e.g., hurdle models) if other values are well represented. Boxplots will be used to check for outliers. Extreme values will be winsorized (i.e., cases retained in the sample, but values made less extreme). Cases with missing data will be compared to complete cases across major study variables to identify if there are systematic differences in missingness. If significant associations are identified, these variables will be used as covariates in later analyses.

To address Primary Aim 1 of the study, the data will be analyzed using latent growth models within a structural equation modeling framework. Separate models will be conducted for each alcohol outcome: alcohol consumption (e.g., quantity), and alcohol-related problems. It is not known the exact trajectory across time (baseline, 1 month, 3 months, 6 months), so a few models will be compared to identify which best captures the shape of change over time. A simple model that reflects change to 1 month (slope 1; initial change post-intervention) and longer-term maintenance (slope 2; linear growth to 9 months) will be compared to models with additional curvilinear components in case longer-term maintenance is not a linear process. Study condition will be dummy coded with “no booster” as the category of reference, and will serve as a predictor of each latent variable (latent intercept, each slope). All models will be conducted using maximum likelihood estimation, and will control for sex. The model for problems will also control for alcohol quantity.

Given that the tailored feedback boosters address both descriptive drinking norms and protective behavioral strategies, these are considered secondary outcomes. Models identical to the one described above will be conducted (e.g., latent growth models with two slopes, regressed on study condition), but with norms and protective behavioral strategies serving as the outcomes of interest rather than alcohol use or related problems (addressing Primary Aim 2). Given prior findings that emailed booster feedback containing personalized normative feedback and protective behavioral strategies (PBS) was significantly more effective for select groups (i.e., those lower in PBS use [Braitman & Henson, 2016], legal age drinkers [Braitman & Lau-Barraco, 2018]), we will examine potential moderators of booster efficacy as a supplementary exploratory analysis. Legal drinking status by age (coded as 1 = *age 21-24* [legal], 0 = *age 18-20* [underage]) and baseline PBS use (in its original continuous metric) will be explored as potential moderators. The moderator and its interaction with study condition will be added as predictors of each latent factor (latent intercept, slope 1, and slope 2). All models will be conducted in Mplus (version 8; Muthén & Muthén, 1998–2019) using maximum likelihood estimation.

For the Exploratory, Secondary Aim, RSIENA will be used to conduct stochastic, actor-based models (Ripley et al., 2017). These will allow us to examine if behavior change precedes network changes (i.e., selection), or if network changes precede behavior change (i.e., socialization). These models will only be conducted if reductions in drinking or related problems are evidenced in the Primary Aim 1 examination (i.e., there is behavior change over time), and if several members of each organization participate (so network change can be examined over time).

**References:**

Braitman, A. L., & Henson, J. M. (2016). Personalized boosters for a computerized intervention targeting college drinking: The influence of protective behavioral strategies. *Journal of American College Health*, 64(7), 509-519.  
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Muthén, L.K. and Muthén, B.O. (1998-2019). *Mplus User's Guide*. Eighth Edition. Muthén & Muthén

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<http://www.stats.ox.ac.uk/~snijders/siena/>