Statistical Analysis Plan

SkillJoy Randomized Controlled Trial

Lucas S. LaFreniere, Ph.D.[1,2]

Michelle G. Newman, Ph.D.[2]

Department of Psychology

Skidmore College[1]

Pennsylvania State University[2]

May 5th, 2019

Planned Statistical Analyses

Power analysis with RMASS II suggested a need for 70 total participants for a two-level longitudinal linear mixed effects model of adequate power (0.80). To account for missing data, we used multiple imputation with 100 iterations of the Markov Chain Monte Carlo (MCMC) method, creating 10 imputed datasets. All results reflect analyses pooled across the imputed datasets. We then used longitudinal multilevel modeling for all outcome measure efficacy analyses. Regarding treatment outcome, longitudinal linear mixed models compared trends of change across time on all symptom, positive affect, and regulation strategy outcome measures between intervention conditions. These models all included the intercept, linear time trend, condition, and interaction between time trend and condition as fixed effects and the intercept as a random effect. Separate models were run to examine the change from baseline/pre-trial to eighth day post-trial (pre- to post-trial; the intervention phase) and from pre-trial to the 30^{th} day follow-up (pre- to follow-up). We also examined the maintenance of treatment gains by comparing trajectories of change from eighth day post-trial measures to the 30^{th} day follow-up. Simple slopes analyses were conducted for each outcome and learning variable within each condition.

Between-condition differences in baseline measures, degrees of missingness, and compliance rates were examined with independent samples t-tests. Reliable change index analyses used the formula of Jacobson and Truax (1991). Cohen's *d* was calculated in the traditional manner for t-tests, Cohen's $d = (M_2 - M_1) / SD_{pooled}$ where $SD_{pooled} = \sqrt{((SD_1^2 + SD_2^2) / 2)}$ (Cohen, 1988). In longitudinal linear mixed models and simple slopes analyses, Cohen's *d* was calculated with an alternative formula fit for multilevel models, $d = 2t/(\sqrt{df})$, as

recommended by Rosenthal (1994). Note that pre- to follow-up analyses are underpowered with the subset of our sample that completed follow-up measures (n = 66).