

Statistical analysis plan

Behavioral Mechanism of Energy Compensation with Exercise
NCT04651218

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Statistical Analysis Linear mixed models will be fit with exercise and time as random effects to account for repeated measures and sex as a fixed effect. Response variables will be transformed if appropriate. With binary explanatory variables, an unstructured covariance matrix for the random effects will be assumed, but alternatives will be considered if needed. VAS scale ratings of hunger/satiety and exercise enjoyment will be assessed and included for adjustment as necessary. Power analysis: Because of our three response variables, we will use a Bonferroni corrected type I error rate of $0.05/3 = 0.017$ for our regression models. In a linear regression model with $n = 60$, 30 males and 30 females, counterbalanced to start with and without exercise and then crossing over to the other treatment, we will have 80% power to detect models with R squared of 20.4% or more (nQuery 8.5.1). Our mixed models will improve model fit and decrease variance estimates compared with linear regression, thus increasing power or decreasing R squared type measures that can be detected.