RMASS2: Repeated Measures with Attrition: Sample Sizes for 2 Groups

Donald Hedeker and Suna Barlas

RMASS2 calculates the sample size for a two-group repeated measures design. It allows for attrition and a variety of variance-covariance structures for the repeated measures. Details on the methods can be found in Hedeker, Gibbons, and Waternaux (1999, *Journal of Educational and Behavioral Statistics*, 24:70-93). In running the program, the default parameter values are given in [ ].

Program Parameters

fout - output file name

n - number of timepoints (maximum is 20)

alpha - alpha level for statistical test (possible values = .01, .05, .10)

nside - sided test (1 or 2)

beta - level of power (from .5 to .95 in multiples of .05)

ratio - ratio of sample sizes (group 1 to group 2)

attrit - attrition across time (1=yes, 2=no)

- *if attrit=1* - attrition rates between adjacent timepoints (assumed equal for both groups)

mtype - type of expected group differences (0=means, 1=effect sizes)

- *if mtype=0* - expected difference in group means at each timepoint
- *if mtype=1* - estype - effect size type (0=constant, 1=linear trend, 2=user-defined)
  - *if estype=0* - expected effect size (equal across time)
  - *if estype=1* - expected effect size at last timepoint
  - *if estype=2* - expected effect size at each timepoint

vtype - variance-covariance structure of repeated measures (0= no random effects: $\boldsymbol{\Sigma}_y = \sigma_j^2 \boldsymbol{R} \quad j = 1, ...n$ timepoints; 1=random-effects structure: $\boldsymbol{\Sigma}_y = \boldsymbol{X}\boldsymbol{\Sigma}_\upsilon \boldsymbol{X}' + \sigma^2 \boldsymbol{\Omega}$)

- *if vtype=0*
  - standard deviation at each timepoint σ_j
  - correlation structure of repeated measures ($\boldsymbol{R}$: 1=AR1; 2=toeplitz or banded matrix; 3=all correlations equal)
- *if vtype=1*
  - nr = number of random effects (maximum is 4)
  - random-effects variance-covariance matrix $\boldsymbol{\Sigma}_\upsilon$
  - random-effects design matrix $\boldsymbol{X}$ ($n \times nr$ elements)
  - error variance σ^2 and autocorrelated error structure $\boldsymbol{\Omega}$

contrast - type of time-related contrast for statistical test (0=average across time, 1=linear trend, 2=user-defined)

- *if contrast=2* - contrast coefficient at each timepoint