

IMPLY

Kevin D. Bird and Emily M. Bird

IMPLY produces deduced intervals (DIs) on any number of secondary contrasts from a set of confidence intervals (CIs) on $(J - 1)$ primary contrasts on J means. IMPLY also provides the coefficient vectors used to express the secondary contrasts as linear combinations of the primary contrasts.

Before running IMPLY, you will need to have obtained the two CI limits for each primary contrast from a statistical package or a program such as PSY (which can be downloaded from <http://www.psy.unsw.edu.au/research/resources/psyprogram.html>). ImPLY is written in R, which can be downloaded from <http://www.r-project.org/>

To run IMPLY:

1. Open R
2. Copy the code (from the file *Imply_code.txt*) into R
3. Type `imply()` into R and press Enter

You will be asked *How many means?* (Answer and press Enter) and *How many Primary Contrasts?* (Answer and press Enter). For each primary contrast, you will be asked for a label/name, a set of J contrast coefficients (separated by commas), a *Scaling Option* (see below), and the confidence interval lower and upper limits (separated by a comma). Once you have provided this information for all primary contrasts, you will be asked *How many Secondary Contrasts?* For each secondary contrast, you will be asked for a label/name, a set of J contrast coefficients (separated by commas), and a *Scaling Option*.

The *Scaling Options* allow you rescale the contrast coefficients if you have entered the coefficients as integers (for convenience) when the CI limits assume either mean difference scaling or interaction scaling. Press 0 if no rescaling is r

refers to the mean difference version of the contrast, 2 if the CI refers to a two-factor interaction contrast expressed as a difference-in-a-difference, and so on. For more on this, see Bird, 2002, pp. 211-212, or Masson & Loftus, 2003, pp. 210-211. Note that the scaling options do **not** change CI limits. The program assumes that if coefficients of *primary* contrasts are to be rescaled, the CI limits provided by you refer to the rescaled version of those contrasts (as is the case if the CIs were constructed by PSY). If the coefficients of *secondary* contrasts are to be rescaled, the DI limits provided by the program refer to the rescaled versions of those contrasts.

Output includes midpoints, limits and widths of all CIs and DIs. In addition, the output shows the coefficients used to express the DIs as linear combinations of the CIs provided.

Example: Find the DIs on *A* and *B*

Output:

Given the CIs on the three primary (main and interaction effect) contrasts, the DIs on secondary (simple effect) contrasts are

$$A(b_1) = A + 0.5AB \in$$