Supplementary material to article 'Selecting the correct RI-CLPM using Chi square-type tests and AIC-type criteria'.

As discussed in the article titled "Selecting the correct RI-CLPM using Chi square-type tests and AIC-type criteria" when employing GORICA to select the true model, it becomes necessary to establish boundaries. This is because the simulated data does not result in zero variances for random intercepts in the CLPM. In our exploration, we considered alternative boundaries, and the hypotheses are presented as follows:

$$\begin{aligned}
&H_1 : \text{Var}_{[\kappa]} > \text{its mean}, \text{Var}_{[\omega]} > \text{its mean} && \text{(RI-CLPM (full))} \\
&H_5 : \text{Var}_{[\kappa]} > \text{its mean}, \text{25th percentile of Var}_{[\omega]} < \text{Var}_{[\omega]} < \text{75th percentile of Var}_{[\omega]} && \text{(RI-CLPM}(\kappa)) \\
&H_6 : \text{25th percentile of Var}_{[\kappa]} < \text{Var}_{[\kappa]} < \text{75th percentile of Var}_{[\kappa]}, \text{Var}_{[\omega]} > \text{its mean} && \text{(RI-CLPM}(\omega))
\end{aligned} \tag{1}$$

The results of the comparison between the use of GORICA with only the mean as boundaries (referred to as the "Old" approach) and the combination of mean and percentiles (referred to as the "New" approach) are presented in the following section.

Selection between CLPM and RI-CLPM

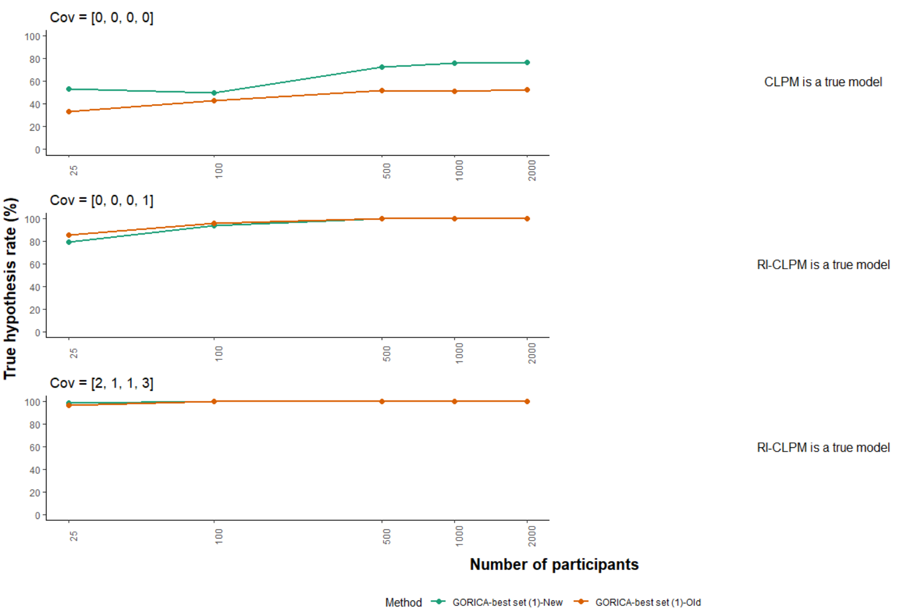

Figure 1: The performance of GORICA-best set (1)–New and –Old to select the true model. When the variances and covariance matrix of the random intercepts are $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$, the true model is identified as CLPM. For all other cases involving different variances and covariance matrices of the random intercepts, the true model is determined as RI-CLPM.

Selection number of RIs in RI-CLPM

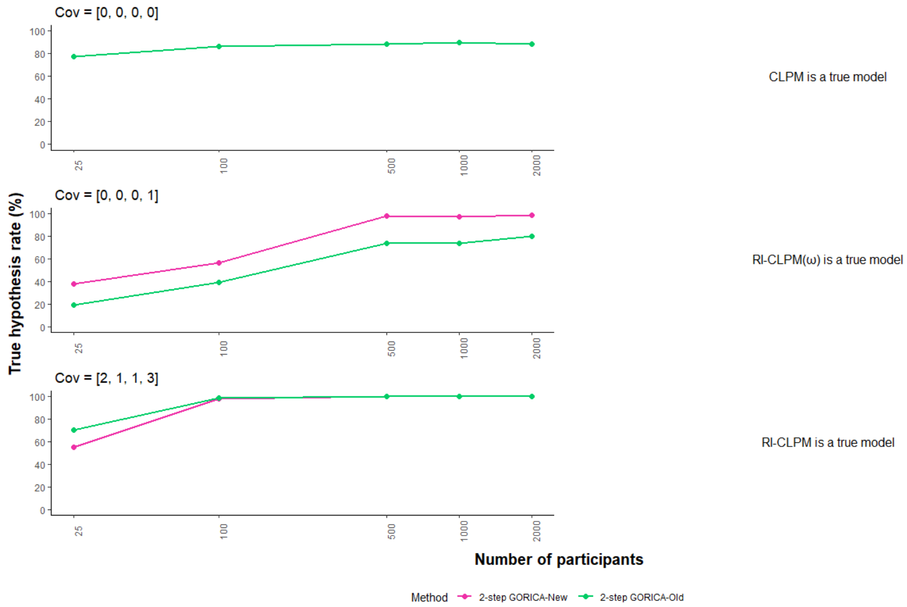

Figure 2: The performance of 2-step GORICA in selecting the true model varies based on different scenarios. When the variances and covariance matrix of the random intercepts is $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$, the true model is identified as CLPM (RI-CLPM with zero random intercept). For cases where the variances and covariance matrix are $\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$, the true model is identified as RI-CLPM (ω) with one random intercept. In all another case where the variances and covariance matrix are $\begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$, the true model is determined as RI-CLPM (full), which includes two random intercepts.