

组内相关系数 / 可靠性研究

此模块计算组内相关系数(ICC1 和 ICC2)，计算方法参考文献：

McGraw, K. O. & Wong, S. P. (1996). Forming some inferences about some intraclass correlation coefficients. *Psychological Methods*, 1, 30-46.

Bliese, P. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 349-381). San Francisco: Jossey-Bass.

例 1：打开练习项目 DEMO，计算家系内成员间体重指数与血压值的相关系数，输入界面：



输出结果：

Method	ICC	ICC 95%CI lower	ICC 95%CI upper
Body mass index, kg/m2			
ICC1 by random effect model	0. 2170		
ICC2 by random effect model, not weighted	0. 4998		
ICC2 by random effect model, weighted	0. 5564		
ICC1 by one-way ANOVA	0. 2084	0. 1391	0. 2852
ICC2 by one-way ANOVA	0. 5170	0. 3965	0. 6187
Systolic BP, mmhg			
ICC1 by random effect model	0. 0615		
ICC2 by random effect model, not weighted	0. 2031		
ICC2 by random effect model, weighted	0. 2379		

ICC1 by one-way ANOVA	0.0304	-0.0246	0.0952
ICC2 by one-way ANOVA	0.1129	-0.1084	0.2997
Diastolic BP, mmhg			
ICC1 by random effect model	0.0019		
ICC2 by random effect model, not weighted	0.0078		
ICC2 by random effect model, weighted	0.0095		
ICC1 by one-way ANOVA	-0.0322	-0.0800	0.0254
ICC2 by one-way ANOVA	-0.1451	-0.4308	0.0959

注解:

ICC by random effect model (从随机效应模型计算的组内相关系数):

let $t00$ = variance in intercept of the model, σ^2 = residual variance for the model.

$ICC1 = t00 / (t00 + \sigma^2)$

ICC2: first computing ICC2 for each group $t00 / (t00 + \sigma^2 / n_j)$, n_j = size of group j .

ICC2 not weighted: the mean across all groups.

ICC2 weighted: the mean across all groups weighted by group size.

ICC by one-way ANOVA:

The CI is computed using formula provided by McGraw & Wong (1996).

从随机效应模型计算的组内相关系数与采用单向方差分析法相比, 当每组样本量相同且没有缺失数据时是相同的; 否则, 从随机效应模型计算的组内相关系数相对更确切。

ICC2: The group mean reliability (Intraclass correlation 2)

例 2, 下载练习数据: www.empowerstats.com/empowerStats/exdata/methcomp.xls
比较 SBP 不同测量结果相关性, 输入界面:

组内相关系数 ?

标题:

选择分析对象:

选择变量

变量

SBP_J1

SBP_R1

SBP_S1

数据结构

组编号变量(Class ID)

分层变量

输出结果:

Method	ICC	ICC 95%CI lower	ICC 95%CI upper
ICC1 from random effect model	0.0703		
ICC2 from random effect model, not weighted	0.8654		
ICC2 from random effect model, weighted	0.8654		
ICC1 from ANOVA	0.0703	0.0114	0.7748
ICC2 from ANOVA	0.8654	0.4961	0.9966

注解:略