Problems with power in a mixed ANOVA

Laszlo Vincze

Swedish School of Social Science, University of Helsinki

Suggested talk duration (15-60 minutes)
max 15 minutes

Summary (max. 500 words)
The purpose of the present study is to establish the longitudinal change in levels of depression among a group of Finnish mothers with high levels of depression before giving birth to their first child. Also, a further purpose is to ascertain whether the change varies among married and cohabitating mothers. Questionnaire data was collected at three time points: three months before the birth of the baby, six months after the birth, and twelve months after the birth. Due to missing cases, there was a gradual decrease in sample size, $N_1 = 25$, $N_2 = 20$, and $N_3 = 15$.
Using standard statistical methods, the final sample in the analysis consists $N_3 = 15$ participants due to case-wise deletion; thus inferences can only be made about those who filled in the questionnaire on all three occasions. In general, married mothers (n = 7) reported higher levels of depression than cohabitating mothers (n=8). The mean difference between the two groups was increasing over time; it was 2.4 at the first time point, 3.93 at the second one and 4.83 at the third one.
Conducting two within-subject ANOVA separately among cohabitating and married mothers indicated significant change across time points among cohabitating mothers, $F = 19.46$, $p < .001$, $\eta_p^2 = .74$. However, the change over time was not significant among married mothers even if the effect size was considerably large, $F = 2.32$, $p = .14$, $\eta_p^2 = .28$.
A 3x2 mixed ANOVA demonstrated a non-significant interaction between time and group ($p = .64$) because of low power (.11); yet, the effect size for the interaction effect was meaningful $\eta_p^2 = .07$. The between subject effect of group was not significant either ($p = .12$).

Relevance to conference theme
How to increase statistical power in small samples.

Keywords (max. 3) mixed ANOVA