The University of Melbourne
Melbourne School of Psychological Sciences
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PSYC40005 Advanced Design and Data Analysis

Laboratory Exercise 10:
Multilevel modeling 2: Random intercept models with level 2 predictors
Random slope models

The data

The data for this week's exercise comes from organizational psychology and derives from that described in Klein et al (2000). The data is in two files, siop.sav and siop-group.sav.

The file siop.sav contains 750 employee-level observations nested within 50 workgroups. Apart from group ID (grpid), there are seven standardised variables, where a higher score indicates a higher level (eg higher pay or more negative leadership behaviours). These data were collected by individual survey of the employees, so measure individual perceptions:

grpid: the group ID
jobsat: job satisfaction
cohes: cohesions
posaff: positive affect
pay:
neglead: negative leader behaviours
wload: workload
tasksig: task significance

In addition to the group ID variable, the file siop-group.sav contains one standardised group level variable:

physen: physical work environment

This variable measures the work environment of each workgroup, with a higher score indicating better working conditions.

1. Disaggregation

Disaggregation: Following the lecture slides from lecture 7, disaggregate physen in the group level file to combine with the other variables in the individual level file (don't forget to Sort Cases first, just in case they are not in the right order.)

2. Random intercept model for job satisfaction

In these exercises, we will predict job satisfaction as the dependent variable.

Follow the lecture slides to fit a random intercept model with one individual-level predictor, positive affect, and one group level predictor, *physen*, of the intercept.

Interpret the results.

3. Random slope model with level 1 predictor

Now we will include a random slope for the association between positive affect and job satisfaction, but without other predictors for the slope. This means that positive affect becomes both a fixed and a random effect.

Examining the significance of the covariance parameters, do we need a random slope model for positive affect?

4. Random slope model with level 2 predictor

Instead of positive affect, repeat the analysis with workload. Do we need a random slope for workload?

Predict the slope for workload using the level 2 predictor *physen*. This means we need an interaction of workload and physical environment in our fixed effects

Does the physical environment explain the different levels of association across groups between workload and job satisfaction?

Reference

Klein et al (2000). Multilevel analytical techniques: Commonalities, differences, and continuing questions. In Klein & Kozlowski (Eds), *Multi-level theory, research and methods in organizations.* (pp 512-553).