

***Laboratory Exercise 9:  
Multilevel modeling 1: Random intercept models with level 1 predictors***

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. Aggregation and Disaggregation

We will begin by practicing the aggregation and disaggregation techniques described in the lectures.

*Aggregation:* Following the lecture slides, create a group level file which contains grpid and the mean of positive affect for each group. Merge this with siop-group.sav to create a new group level file containing two variables (in addition to the ID.)

*Disaggregation:* Following the lecture slides, 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. Null model for job satisfaction

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

The first step is to ask whether we need a multilevel model by examining a null random intercept model for job satisfaction. (This is the same as a random effects ANOVA.)

Using the individual level file, use **Analyze -> Mixed models -> Linear...** then follow the instructions from the lecture slides to obtain variance components within and across groups for job satisfaction.

Is the group level variance (the intercept variance) significant? Calculate the intra-class correlation.

### 3. Random intercept model with one predictor

Now follow the lecture slides to fit a random intercept model with one individual-level predictor, positive affect.

Is positive affect a significant predictor of job satisfaction?

Is there still significant variance to explain at the group level?

### 4. If you have time...

You can use other level 1 variables to predict job satisfaction. Interpret the resulting model.

### 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).