

Lab 2a: Centering

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Today's Roadmap

- ▶ Centering in R
- ▶ Class exercise on Contextual Effects
- ▶ Upload a word or pdf only by end of class
 - ▶ Only provide answers to questions
 - ▶ No .Rmd or excel file needed
- ▶ Monday Lab: Longitudinal MLM

A little centering in R

Grand mean centering

```
exam <- read.csv(file = "exam.csv", header = TRUE)
head(exam)
exam$lrt_gmc <- exam$LRTscore - mean(exam$LRTscore)
```

Centering at specific values

To center a variable at some specific value (e.g., 5), simply change the mean function to a specific value in the code

```
dat$NewVar <- dat$OldVar - 5
```

For example we can do this for the variables sex and time below

```
GPA_long$sex <- unclass(GPA_long$sex) - 1  
#additional info about type needed
```

```
GPA_long$time <- as.numeric(GPA_long$time) - 1
```

if you wanna recenter,
not to the avg. time point
but to a certain time point (e.g. 1)
that's what you want your intercept
to represent.

Group mean centering at L1 predictors

To implement the group mean centering, a new variable is created to represent a group mean and then an original variable is subtracted by the group mean.

```
exam$lrt_groupmean <- ave(exam$LRTscore, exam$i..School)  
exam$lrt_wcc <- exam$LRTscore - exam$lrt_groupmean
```

- ▶ The ave function can be used to create a new group mean variable where the first argument is the target variable and the second argument is the grouping variable.
- ▶ Model fit, fixed effects, and the variances of random effects will be different. Researchers should use "theory" to make decisions on centering. Review Enders and Tofighi (2007).

*Note: level-2 predictors can also be centered (also at the grand mean or specific value)