SMLP2020_stream4: Basic dimensions of factors and covariates relevant for MM specification

Factors / Covariates

- between vs within
- fixed vs random
- experimental vs quasi-experimental

Factors: discrete levels
Covariates: continuous values

Difference between "between" and "within"

1. ... does not matter for means and standard deviations

$$SE = \frac{SD}{\sqrt{N}}$$

2. ... does matter for standard errors and confidence intervals if several means are to be compared
(Reason: correlation between scores associated with levels of within-subject factors)

Difference between "fixed" and "random" ...

1. ... does matter "philosophically": generalizability

beyond levels only for "random"

(2) ... not of much use when there is on a small number of levels k (almost always: $k <= 5$; possibly also $k <= 20$); use "fixed" in this case

(3) ... is relevant for choice of method; when 2 or more random factors (e.g. Subj, Items) in design:

- 1 random factor: [rm] A.o.V, [rm] MRA
- 1, 2, .. random factors: [G] LMM

Difference between "exp." and "quasi-exp." ...

(1) ... does not matter for specification of statistical model [Exception: AoV → estimate of ge. σ^2]

(2) ... does matter for interpretation of effects

- exp: causal interpretation (physical v. mental fatigue)
- quasi-exp: correlation (gender)

Note: interaction of exp. factor and quasi-exp. factor is quasi-experimental interaction

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