Variable Names in R Script

- Keep them short, but aim for mnemonic value

NOT: ~~var1~~ ~~var2~~

- length of 3 to 5 letters

- shorten the name by dropping vowels

complex → cmplx → cpx

parsimonious → → prm

zero-correlation-parameters → → zcp

- aiming for equal length to facilitate editing with multiple cursors

[Independen variable]

Factor | Covariates

[Dependent Variables]

Factor: discrete set of levels

Covariate: numeric (continuous) variable

① – between – or within –

[Subject] – Exp – Control | Subject = longitudinal, age, IQ

[News] – Fake – True | [News] = same system change

[Words] – length – freq | [Word] – contrast – duration

RELEVANCE OF DISTINCTION: Observations are independent | dependent

② – fixed or random sample of levels from population

fixed – exp v. Control – small number of levels

RELEVANCE OF DISTINCTION: Results are valid only for levels of factor | Results generalize to other members of the population

③ experimental or quasi-experimental

Experimenter assigns subjects, items, etc. to levels of factor

Group: Treatment / Control

Subject/word "brings" level to the experiment

Gender: male, female, diverse

RELEVANCE OF DISTINCTION:

Effects are CAUSED by experimental manipulation

Effects are CORRELATED with quasi-exp. manipulation

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] AoV, [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. Eta²]

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

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

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

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