April 21, 2017

This time: experimental designs
Next time: probability

read: DD ch. 7-8
LN pp. 95-118
today: LN p. 72

homework #1 due today @ 11:59 pm on canvas.uwsc.edu

Controlled experiment: treatment (T) + control (C) groups are compared, + experimenters have control over which subjects get into which groups
(R-36) flow chart for classifying experimental designs

Two methods to break link between z_i + $\overline{X}$
1.) randomization of subjects to (T) + (C): this makes z_i in (T) and ~~x~~ z_i in (C) equal on average (no bias)
founder of ~~contempory~~ contemporary experimental design
R.A. Fisher (1890-1962) statistician + geneticist

bias - systemetric tendency to over- or underestimate the truth
randomization destroys bias (good)

2) hold PCF constant in the design

ex. RCT of drug to lower hypertension (high blood pressure)
(T) drugs: blue pill w/ drug > placebo
control: identical blue pill w/out drug
goal: try to keep subjects from knowing their T/C status
↳ blinding the subjects

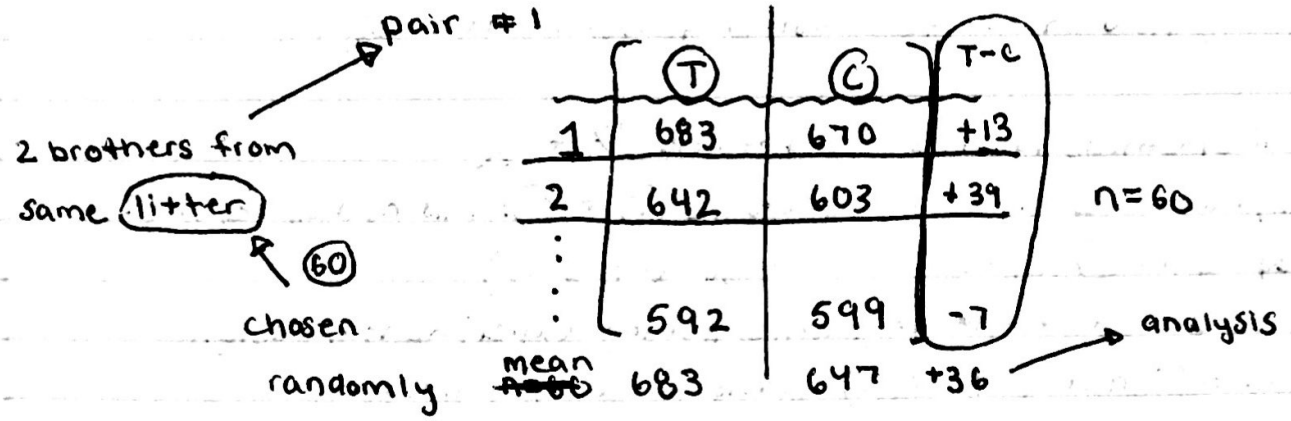
why is this good?

↳ to eliminate bias from the placebo effect: people may respond to the idea of treatment rather than to the treatment itself.

also a good idea to ~~blind~~ blind the experimenters to T/C status: both: double-blinded experiment

an unbiased experimental design, for example, RCT, is called valid

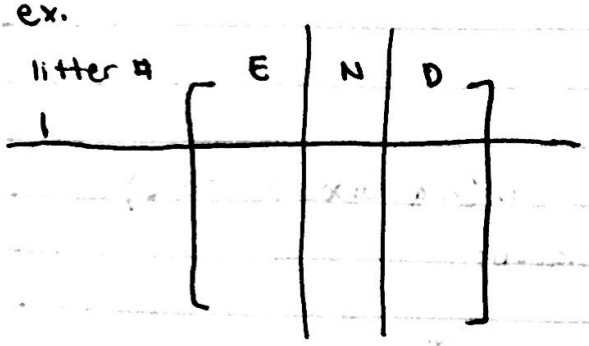
matched pairs Design



* this design is also valid but is likely to be more accurate

matching but w/ more than 2 subjects matched: randomized blocks

ex.



blocksize=3

matched pairs is a special case of randomized blocks w/ block-size 2

one other way to get matched pairs

ex.

Ⓣ = new drug to combat insomnia

Ⓒ = placebo