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Random assignment

Random assignment or **random placement** is an experimental technique for assigning human participants or animal subjects to different groups in an experiment (e.g., a treatment group versus a control group) using randomization, such as by a chance procedure (e.g., flipping a coin) or a random number generator. This ensures that each participant or subject has an equal chance of being placed in any group. Random assignment of participants helps to ensure that any differences between and within the groups are not systematic at the outset of the experiment. Thus, any differences between groups recorded at the end of the experiment can be more confidently attributed to the experimental procedures or treatment.

Random assignment, blinding, and controlling are key aspects of the design of experiments, because they help ensure that the results are not spurious or deceptive via confounding. This is why randomized controlled trials are vital in clinical research, especially ones that can be double-blinded and placebo-controlled.

Benefits of random assignment

Imagine an experiment in which the participants are not randomly assigned; perhaps the first 10 people to arrive are assigned to the Experimental Group, and the last 10 people to arrive are assigned to the Control group. At the end of the experiment, the experimenter finds differences between the

Experimental group and the Control group, and claims these differences are a result of the experimental procedure. However, they also may be due to some other preexisting attribute of the participants, e.g. people who arrive early versus people who arrive late.

Imagine the experimenter instead uses a coin flip to randomly assign participants. If the coin lands heads-up, the participant is assigned to the Experimental Group. If the coin lands tails-up, the participant is assigned to the Control Group. At the end of the experiment, the experimenter finds differences between the Experimental group and the Control group. Because each participant had an equal chance of being placed in any group, it is unlikely the differences could be attributable to some other preexisting attribute of the participant, e.g. those who arrived on time versus late.

happen, and when it does it might add some doubt to the causal agent in the experimental hypothesis.

Random sampling

Random sampling is a related, but distinct process.[1] Random sampling is recruiting participants in a way that they represent a larger population.[1] Because most basic statistical tests require the hypothesis of an independent randomly sampled population, random assignment is the desired assignment method because it provides control for all attributes of the members of the samples—in contrast to matching on only one or more variables—and provides the mathematical basis for estimating the likelihood of group equivalence for characteristics one is interested in, both for pretreatment checks on equivalence and the evaluation of post treatment results using inferential statistics. More advanced statistical modeling can be used to adapt the inference to the sampling method.

History

Randomization was emphasized in the theory of statistical inference of Charles S. Peirce in "Illustrations of the Logic of Science" (1877–1878) and "A Theory of Probable Inference" (1883). Peirce applied randomization in the Peirce-Jastrow experiment on weight perception.

Charles S. Peirce randomly assigned volunteers to a blinded, repeated-measures design to evaluate their ability to discriminate weights.[2][3][4][5] Peirce's experiment inspired other researchers in psychology and education, which developed a research tradition of randomized experiments in laboratories and specialized textbooks in the eighteen-hundreds.[2][3][4][5]

Jerzy Neyman advocated randomization in survey sampling (1934) and in experiments (1923).[6] Ronald A. Fisher advocated randomization in his book on experimental design (1935).

See also

- Asymptotic theory (statistics)

References

1. ^ **a** **b** http://www.socialresearchmethods.net/kb/random.php. Missing or empty `|title=` (help)
2. ^ **a** **b** Charles Sanders Peirce and Joseph Jastrow (1885). "On Small Differences in Sensation". *Memoirs of the National Academy of Sciences*. **3**: 73–83.
3. ^ **a** **b** Ian Hacking (September 1988). "Telepathy: Origins of Randomization in Experimental Design". *Isis* (A Special Issue on Artifact and Experiment). **79** (3): 427–451. doi:10.1086/354775.
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5. ^ **a** **b** Trudy Dehue (December 1997). "Deception, Efficiency, and Random Groups: Psychology and the Gradual Origination of the Random Group Design". *Isis*. **88** (4): 653–673. doi:10.1086/383850. PMID 9519574.
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External links

- Experimental Random Assignment Tool: Random assignment tool - Experimental