



Experimental Design

Part 2: Blinding

Blinding

- In order to avoid inappropriate influence of the researcher or the subject on the results . . .
- Blinding is a good practice: If the person analyzing the results **does not know** which results were obtained under which conditions, **it is nearly impossible for the researcher to throw away valid results or to tweak the analysis in some way, ultimately supporting or falsifying the hypothesis due to some bias.**
- **CRITICAL** in studies with human subjects; **IMPORTANT** in studies with non-human subjects

Zero-blind

- Experimenters know the values of the variable(s) being tested.
- Subjects know the values of the variable(s) being tested.

Why might this be problematic?

- If both the subjects and the experimenters have expectations about the results of a test, they can (and research show, WILL) ‘filter’ and otherwise **bias the outcome**.
 - Mechanisms for this?

Single-blind

- Experimenters know the values of the variable(s) being tested.
- Subjects **do not** know the values of the variable(s) being tested.

Why might this still be problematic?

- Subjects' expectations might no longer affect the outcome of the test.
- However, experimenters' expectations can continue to **bias the outcome**.
 - Mechanisms for this?
 - How is this relevant in experiments with non-human subjects?



Double-blind

- Neither experimenters nor subjects know the values of the variable(s) being tested.
- Is there still room for bias?
 - Possibly in the experimental design itself.

Blinding: non-human subjects

- Is most non-human subjects research zero-blind, single-blind, or double-blind?
- Which is desirable? Why?
- What is feasible?

Blinding: Example

- The results from a randomized experiment conducted at the American Economic Review on the effects of double-blind versus single-blind peer reviewing on acceptance rates and referee rating indicate that **acceptance rates are lower and referees are more critical when the reviewer is unaware of the author's identity.**
- These patterns are not significantly different between female and male authors. *(What was the hypothesis?)*
- Authors at top-ranked universities and at colleges and low-ranked universities are largely unaffected by the different reviewing practices. *(What was the hypothesis?)*
- The authors at near-top-ranked universities and at nonacademic institutions have lower acceptance rates under double-blind reviewing. *(What was the hypothesis?)*

Blinding: Example (+ Ethics)

- A study was designed to ascertain whether individuals with mood disorders are particularly vulnerable to adverse effects of aspartame.
- The protocol required the recruitment of 40 patients with depression and a similar number of individuals without a psychiatric history.
- Subjects received aspartame 30 mg/kg/day or placebo for 7 days. Despite the small n , there was a significant difference between aspartame and placebo in number and severity of symptoms for patients with a history of depression, whereas for individuals without such a history there was not.
- We conclude that individuals with mood disorders are particularly sensitive to this artificial sweetener and its use in this population should be discouraged.
- **Ethical aspect:** The project was halted by the Institutional Review Board after a total of 13 individuals had completed the study because of the severity of reactions within the group of patients with a history of depression.



The End