Friedrich-Alexander-Universität
Technische Fakultät

Machine Learning
Data Analytics

FAU

Human Computer Interaction

Chapter 6: Evaluation Part 2

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Summary Experimental Design

Summary: Experimental Design

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Cause & effect

Experiments try to discover
cause and **effect** relationships
by comparing two situations:

Experimental condition:
Supposed cause is **present**

Control Condition:
Supposed cause is **absent**

Experiment (Cause - present)

IV - ON

Control => Cause (NO)

IV - Off

Summary: Experimental Design

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Design considerations

- Define what you want to **manipulate** (independent variable)
- What you want to **measure** (dependent variable)
- Independent (**between groups**) or repeated measures (**within groups**) design
- Use randomisation to rule out **unsystematic variance**
- Consider **ethical issues** in your design

Summary: Experimental Design

Cause ; Representation.

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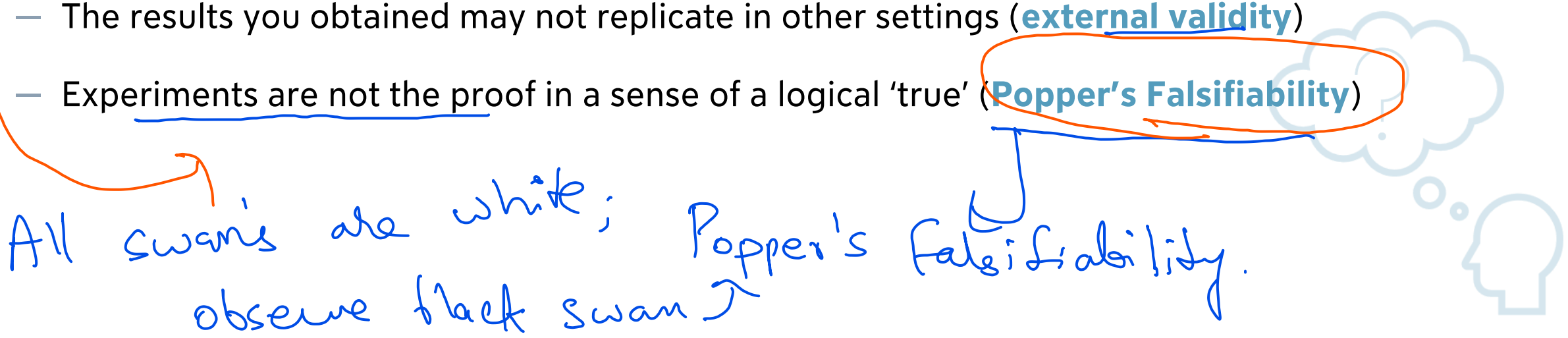
Be careful with conclusions

→ Insufficient Cause aspects.

- The **independent variables** may not exactly isolate the suspected cause
- The **dependent variables** may be invalid representations of what you intend to measure
- Your sample may **bias the outcome**
- The results you obtained may not replicate in other settings (**external validity**)
- Experiments are not the proof in a sense of a logical 'true' (**Popper's Falsifiability**)



Thank you for your attention