

Every baby
knows the

scientific method!





CTHCI Lab 3

Designing a User Study

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<http://hci.rwth-aachen.de/cthci>



User Study Protocol*

- A document that explicitly states why a research project is being conducted and how
- Purpose:
 - Clearly state the research question and hypotheses
 - Plan the research procedure in details
 - A guide for all involved personal
 - Monitor research progress

*(O'Brien and Wright, 2002) How to write a protocol



Protocol Structure: The research problem

- Title - “Evaluating the performance of a new keyboard layout”
- Research problem - “We intend to find if our new keyboard layout performs faster and with less errors than the QWERTY keyboard. The new layout would lead to smaller form factors.”
- Context - “There have been many new layouts that appear to perform faster than QWERTY but lead to fatigue [X,Y,Z]”
- Aim (derived from context)
- Hypotheses - “There is no difference in typing speed between the new layout and QWERTY”



Protocol Structure: The research method 1/2

- Independent variables & dependent variables (levels, operational definition, measurement scale and unit)
- Task - “The user will perform a composition task using statements from MacKenzie e al. (CHI 2003). The participant will do the following activities to complete the task...”
- Subjects/Participants (number, main characteristics, criteria to include or exclude them)
- Experimental design (within or between participants and how the conditions will be assigned)



Protocol Structure: The research method 2/2

- Experiment setup and/or apparatus (such as hardware or special features in the testing space)
 - Experiment procedure (what the experimenter will do to setup the testing space)
 - Data analysis methods
 - References
- ➔ Include images or sketches if informative
- ➔ Write this section in future tense



In-class Exercise: Reconstruct a Protocol

- Watch paper video
- Look at the User Study section in the given paper
- Reconstruct the protocol
- Evaluate against the authors' protocol
- How did the paper attempt to establish internal and external validity?



Understanding Finger Input Above Desktop Devices

hci.rwth-aachen.de/fins

Chat Wacharamanotham

Kashyap Todi

Marty Pye

Jan Borchers

CHI 2014

Room 718A

April 29th, 9:00 – 10:20

[Source](#)

Protocol Evaluation Check List

- Is the research question stated clearly?
- Is there any alternative interpretation of the question?
- Suppose you can prove the stated hypotheses, does it contribute to the understanding of the research question?
- Are variables defined clearly on the operational level?
- Is there more than one possible interpretation for the variables?
- Is the experimental design chosen carefully with consideration of the trade-offs?
- Are the statistical methods specified?
- Are the resources needed to conduct the experiment stated?
- Is the duration of the experiment appropriate?
- Ultimate question: If you had no idea about the experiment before, could you pick up this protocol, set up, and conduct the experiment? (Replicability)



Reading Assignment

- Required means content from this paper is examinable
- Assignments so far
 - Last week: (MacKenzie, 2007) *Evaluation of Text Entry Techniques*
 - This week:
 - (LaToza, T. D., & Myers, B.A., ICSE 2010) *Developers ask reachability questions*
 - (McGrath, 1995) *Methodology matters*. **Read before the next lab!**
- A02 will be on our public website today

