DCGI

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EMPIRICAL HCI STUDY
EXPERIMENT EXECUTION, POWER ANALYSIS

SAN 2023/24

EMPIRICAL HCI STUDY

- Goal of the study is to test the performance of the newly design keyboard for text writing

- 1. Define research questions

- 2. Define experiment variables

- 3. Describe participants and recruitment procedure

- 4. Define procedure and tasks

- 5. Conduct experiment and measure data

- 6. Evaluate the data measured and draw conclusions

CONDUCT THE EXPERIMENT

- Read the instructions

- Prepare the experiment setup

- Conduct the experiment

- Store measured values into a shared table:

https://1url.cz/bud7l

Method "A"

Q	F	U	M	C	K	Z
space		O	T	H		space
B	S	R	E	A	W	X
space		I	N	D		space
J	P	V	G	L	Y	

the quick brown fox jumps over the lazy dog

Method "C" (Dvorak)

	P	Y	F	G	C	R	L	
A	O	E	U	I	D	H	T	N	S
	Q	J	K	X	B	M	W	V	Z
				space				

the quick brown fox jumps over the lazy dog

Instructions and Apparatus

Study and memorize the phrase below. Enter it by tapping with a non-marking stylus on the keyboard image. Proceed as quickly as possible while trying not to make mistakes. Don't forget to tap SPACE between words. Your partner will time you with a watch. Begin when your partner says "start". So that your partner knows when you finish, please say "stop" when you tap the last character (the "g" in "dog").

Enter the phrase five times using Method A, then five times using Method B. Then, switch roles with your partner. **Your partner should do Method B first, Method A second.**

DETAIL INSTRUCTIONS

- Research questions (+ null hypothesis)
  - you can define more than one research questions
- Independent and dependent variables
  - think also of other variables than those needed for measuring speed (NOTICE: A relevant research question must be defined for them)
  - what can be the other variables (control, random, confound)
  - how the values will be measured
- Participants
  - what population does it (should it) represent
  - what should you be aware of during recruitment
- Counterbalancing (within vs. between subject setup)
- Procedure and tasks
- Classification of the experiment validity

DETAIL INSTRUCTIONS

- Statistical analysis of data reporting
  - H_0/H_1 rejection/acceptance
  - group effect, asymmetric learning effect
  - learning curve across trials
    - compare learning curve of method A and B
    - how to determine number of trials when the method A will become faster than method B

- Power analysis of the experiment setup
  - compute and discuss optimal parameters (power, effect size, α, n) for such study

- Parameters of discovery experiment
  - n, X % chance of discovering problems affecting Y % of users

THANK YOU FOR ATTENTION