

# Introduction to HCI

## Fall 2021

### Field studies

### Questionnaires

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# Logistics

- ▶ Team formation
- ▶ In-class activities with team starts from next Thursday

# Learning Goals

- ▶ Explain when and why questionnaires may be appropriate evaluation technique choice; discuss their pros/cons
- ▶ List different styles of questions (open, closed, Likert, etc.) And give examples of what they are appropriate for
- ▶ Give examples of different kinds of data that can be collected
- ▶ Discuss important considerations for designing and administering a questionnaire

# Questionnaires: When and why?

- ▶ Evaluating to understand: good for reaching lots of people early on
- ▶ Evaluation of prototypes: typically used in combination with other methods (but not always)
- ▶ Also called 'surveys'
  - ▶ Survey is a complete methodological approach: a process for gathering data that could involve a wide variety of data collection methods, including a questionnaire (list of questions).

# Questionnaires - What can you do with them?

- ▶ Evidence of wide general opinion
- ▶ **Pros/cons:**
  - ▶ Can reach a wide subject group (e.g. Mail or email)
  - ▶ Does not require presence of evaluator
  - ▶ Many results can be quantified
- ▶ Can have low response rate and/or low quality response
- ▶ Difficult to do in-depth 'probing'

# What kinds of data can you collect?

Questionnaires can gather both:

- ▶ Subjective AND objective data
- ▶ Qualitative AND quantitative data

# Styles of questions: open-ended

- ▶ Asks for opinions
- ▶ Good for general subjective information
  - ▶ But difficult to analyze rigorously

For example, "can you suggest any improvements to the interface?"

# Styles of questions: closed

- ▶ Restricts responses by supplying the choices for answers
- ▶ Can be easily analyzed ...
- ▶ But can still be hard to interpret, if questions / responses not well designed!
  - ▶ Options should be very specific
  
- ▶ Do you use computers at work:
  - o often
  - o sometimes
  - o rarely
  
- ▶ In your typical work day, do you use computers:
  - o Over 4 hrs a day
  - o Between 2 and 4 hrs daily
  - o Between 1 and 2 hrs daily
  - o Less than 1 hr a day



## Styles of questions: combining open-ended and closed questions

- ▶ Gets specific response, but allows room for user's opinion
- ▶ It is easy to recover from mistakes:

disagree					agree
1	2	3	4	5	

Comment:...

...the undo facility is great!...

# Styles of questions (closed): scalar --- Likert scale

- ▶ Measure opinions, attitudes, and beliefs
- ▶ Ask user to judge a specific statement on a numeric scale
- ▶ Scale usually corresponds to agreement or disagreement with a statement
- ▶ Odd or even numbered (what's the difference?)

Characters on the computer screen are hard to read:

Strongly agree

Strongly disagree

1

2

3

4

5

## Styles of questions (closed): scalar --- semantic differential scale

- ▶ Similar to Likert scales - also measure opinions, attitudes, beliefs
- ▶ But explore a range of bipolar attitudes about a particular item
- ▶ Each pair of attitudes is represented as a pair of adjectives
- ▶ Generally easier cognitively to answer than Likert

Moodle is:

poorly	1	2	3	4	5	well designed
clear	1	2	3	4	5	confusing
attractive	1	2	3	4	5	ugly

# Styles of questions (closed): ranked

- ▶ Respondent places an ordering on items in a list
- ▶ Useful to indicate a user's preferences
- ▶ Forced choice

Rank the usefulness of these methods of issuing a command  
(1 most useful, 2 next most useful..., 0 if not used)

\_\_2\_\_ command line

\_\_1\_\_ menu selection

\_\_3\_\_ control key accelerator

# Styles of questions (closed): multi-choice

Respondent is offered a choice of explicit responses

How do you most often get help with the system? (tick one)

- on-line manual
- paper manual
- ask a colleague

Which types of software have you used? (tick all that apply)

- word processor
- data base
- spreadsheet
- compiler

# Designing a questionnaire

- ▶ Establish the **purpose** of the questionnaire:
  - ▶ What information is sought?
  - ▶ How would you analyze the results?
  - ▶ What would you do with your analysis?
- ▶ Determine the **audience** you want to reach
  - ▶ Typical when using questionnaire for understanding: random sample of
  - ▶ between 50 and 1000 users of the product
- ▶ **Test** everything before sending it out:
  - ▶ Test the **wording**
  - ▶ Test the **timing**
  - ▶ Test the **validity**
  - ▶ Test the **analysis**

# Designing good questions

- ▶ Unlike interviews, hard to ask a follow-up questions
- ▶ Extra important to get questions right
- ▶ A few general guidelines:
  - ▶ Be specific and clear about how users should answer
  - ▶ Keep questions short and easy to follow
  - ▶ Avoid 'double-' and 'triple-barreled' questions
    - ▶ E.g., How often have you used the system and what do you like about it?
  - ▶ Avoid ambiguity and too much room for interpretation
  - ▶ Avoid biasing responses as much as possible

# Validity

- ▶ Are your questions getting at what you want?
- ▶ Can increase validity by...
  - ▶ Piloting (see how people answer)
  - ▶ Use previously validated questionnaires (studied extensively to confirm they gather what they intend to gather)



# Tradeoffs

- ▶ Questionnaires are limited by length and complexity
  - ▶ Can't always ask about everything you want to
- ▶ Try to focus questions on what you really want to learn
  - ▶ A few focused questions more useful than many general ones.
  - ▶ If the answer is obvious, you probably don't need to ask it!
- ▶ But be careful of focusing too much on what you expect to the exclusion of other explanations

# Administering questionnaires

In-person administration	<ul style="list-style-type: none"><li>▶ Requires time to administer, but highest completion rate</li></ul>
"Take home"	<ul style="list-style-type: none"><li>▶ Often subjects don't complete / return the questionnaire</li></ul>
Email	<ul style="list-style-type: none"><li>▶ Permits subjects to answer on their own time</li><li>▶ Responses may tend to be more free-form</li><li>▶ Response rates depend on trust in source</li></ul>
Web-based forms	<ul style="list-style-type: none"><li>▶ Standardize formats and responses</li><li>▶ Browser script to ensure correct / complete</li></ul>
General issues	<ul style="list-style-type: none"><li>▶ Payment or incentives</li><li>▶ Anonymity</li><li>▶ Self-selection</li></ul>

# Summary: questionnaires

- ▶ Establish purpose
- ▶ Determine audience
- ▶ Variety of administration methods (for different audiences)
- ▶ Design questions:
  - ▶ Many kinds, depend on what you want to learn
  - ▶ Most important distinction: open/closed (like structured/unstructured interview questions)
- ▶ Be considerate of your respondents
- ▶ Motivate your respondents (without biasing them).

# In-class activity (20 mins)

- ▶ Break out in teams
- ▶ Work in groups
- ▶ Critique the provided examples of bad questions
  - ▶ What category of error do they fall in?
  - ▶ Provide solutions to fix the error
- ▶ <https://tinyurl.com/s7p6uss8>

# Optional reading

- ▶ "Research Methods in Human Computer Interaction"
  - ▶ "Research Methods in Human Computer Interaction" is available as an e-book through the library. This links to the entire book and you will be asked to log in using your UMass credentials. Please read Chapter 1, Section 1.1-1.10
  - ▶ <https://go.oreilly.com/umassamherst/https://learning.oreilly.com/library/view/~/9780128093436/?ar>
- ▶ Chapter 5: "Surveys," Sections 5.1-5.11