Methods Workshop: Cognitive interviewing in e- & mHealth research

Andre Matthias Müller, PhD
Saw Swee Hock School of Public Health, NUS

http://blog.nus.edu.sg/sphpanda/
1. Background
2. Preparation
3. Doing the Cognitive interview
4. Analysis
5. Pros and Cons
6. Discussion
7. Resources
Background
What are Cognitive Interviews-Questionnaires

**IPAQ item**
During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ days per week

**Issue**
How do people interpret and subsequently respond to this question?
• different age groups, education, background…
  (eg, Heesch et al., 2010)
What are Cognitive Interviews-digital health

Website

Issues

How do people perceive the content, tone/language, interface and features?

How do people navigate through the material?

• different age groups, education, background…

(eg, Rowsell et al., 2015)
What are Cognitive Interviews

Overview

• Origin in Experimental Psychology (Willis & Artino, 2013)

• Based on Cognitive Model (Tourangeau, 1984)
  – Comprehension
  – Retrieval of information
  – Judgement or estimation
  – Selection of response

• Initially mainly used for survey development:
  “Study the manner in which target audiences understand, mentally process, and respond to material presented.” (Willis, 2005)
What are Cognitive Interviews

Theory background

- Output from short-term memory
- Think aloud does not contaminate verbal processes
1-Think aloud interview

- Participants job: verbalize thoughts right in the moment when looking at the website, app or questions
- Interviewers jobs: support participant by asking to “keep talking”, record

2-Verbal probing/neutral prompts

- Interviewers jobs: provide probe questions specifically designed to elicit detailed information (e.g., about a feature of a website) (Willis & Artino, 2013; Willis, 2005)
Preparation
Basics

Recruitment
• 15 to 40 people
• Whole spectrum of target population (age, sex, education)

Logistics
• Prepare recording device, notepad
• Interview length: 45 to 75 min
• Prepare things you might want to explore
Protocol components 1:
- Instructions
  - Incl. think aloud practice
- Prompts
  - Proactive: enquire about specific issues (“What does this phrase mean to you?”)
  - Reactive: based on participant behavior (“Why did you click this?”)

<table>
<thead>
<tr>
<th>Proactive prompts</th>
<th>Reactive prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are your first impressions of this page?</td>
<td>What are you thinking now?</td>
</tr>
<tr>
<td>What do you think about this sentence?</td>
<td>Can you tell me why you just shooked your head?</td>
</tr>
<tr>
<td>Could you think of a different way to say this.</td>
<td>What is not clear here? How could it be improved?</td>
</tr>
</tbody>
</table>
Protocol

Protocol components 2:

• Debriefing questions
  – “Overall, how do you feel about the website, app, survey?”

• Big-picture questions
  – Research procedures: “How many times a week do you think you would look at the app/website?”
  – Subject questions: “After seeing this website/app, how do you feel about being more active?”
Doing the Cognitive Interview
What to do during the interview

Short answer: Not much 😊
What to do during the interview

Longer answer

1. Record the interview (verbatim/video + notes)
2. Say what question/page we are on if not clear
3. Encourage, prompt
4. Avoid answering questions/providing help: Participant might ask “What does that mean?”; “How can I get back to the homepage?”
Practice 😊
Groups

Interview 1: Middle aged adult
HPB Healthy living
https://www.hpb.gov.sg/healthy-living

Interview 2: Teenager (smoker)
Teen Smokefree.gov
https://teen.smokefree.gov/

Interview 3: Overweight adult (backup)
My diet coach app

Familiarization with sheet and website/app!
Analysis

Any thoughts?
Group feedback

What did you find and what changes could you suggest?
Iterative development

1. Combine responses pertaining to each question/page of a website/app

<table>
<thead>
<tr>
<th>Issues</th>
<th>No. of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why unlocking only after 24h?</td>
<td>3</td>
</tr>
<tr>
<td>My Progress is misleading</td>
<td>1</td>
</tr>
<tr>
<td>Color scheme of the left box is odd.</td>
<td>2</td>
</tr>
</tbody>
</table>

2. Change content, functionality…

3. Test again

→ Iterative process
Iterative development

Outcomes of Cognitive Interviews

- Changes to wording (simplify)
- Changes to order and structure
- Changes to quantity of content
- Adding/removing features
- Discovering technical problems
- ...

(Willis, 2005)
Proper qualitative analysis

Topics:

• What did participants think about health behaviors? (Corbett et al., 2018)

• How did older adults perceive the various web features?
Pros and Cons

Any thoughts?
Pros/Opportunities

1. Not much training required for interviewer
2. Interviewer with only few jobs during interview
3. Less bias in responses and interviews are not very directive
4. Gathering info on in-the-moment perceptions close to real life
Cons/Pitfalls

1. Participant burden due to unnatural process
   • Varying proficiency thinking out loud
   • Participants may stray from task
2. Difficult analysis of think-aloud transcripts due to sometimes messy responses
3. Verbal probing can be leading and can lead to more thought through verbalisations that are not common in real-life situations
Discussion
Resources

PowerPoint
Handout
Interview Guide
Thank you lah...

Twitter: @Andre_M_Muller; @PANDA_SPHSG
References


