# Methods Workshop:
# Cognitive interviewing in e- & mHealth research

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



P.A.N.A
PHYSICAL ACTIVITY AND NUTRITION DETERMINANTS IN ASIA

**http://blog.nus.edu.sg/sphpanda/**

# Agenda

1. Background
2. Preparation
3. Doing the Cognitive interview
4. Analysis
5. Pros and Cons
6. Discussion
7. Resources

# Background

**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.
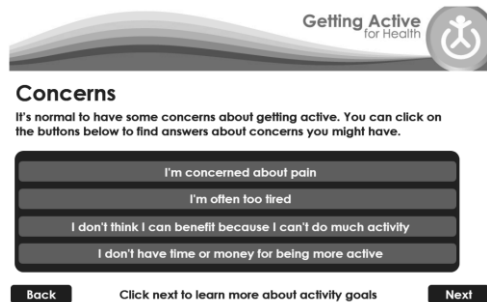
_____ days per week

Issue

How do people interpret and subsequently respond to this question?

- different age groups, education, background…

(eg, Heesch et al., 2010)

**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

<u>Theory background</u>

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

# Cognitive Interviews: Key techniques

## *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

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?")

| Proactive prompts | Reactive prompts |
|---|---|
| What are your first impressions of this page? | What are you thinking now? |
| What do you think about this sentence? | Can you tell me why you just shacked your head? |
| Could you think of a different way to say this. | What is not clear here? How could it be improved? |

# 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



| Issues | No. of participants |
|---|---|
| Why unlocking only after 24h? | 3 |
| My Progress is misleading | 1 |
| Color scheme of the left box is odd. | 2 |

## 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)

# Subject-matter related

**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

- Corbett, T., Cheetham, T.E., Müller, A.M. et al. (2018). Exploring cancer survivors' views of health behavior change': "Where do you start, where do you stop with everything?" *Psycho Oncology.*

- Rowsell, A., Muller, I., Murray, E., Little, P., Byrne, C. D., Ganahl, K., ... & Nutbeam, D. (2015). Views of people with high and low levels of health literacy about a digital intervention to promote physical activity for diabetes: A qualitative study in five countries. *Journal of medical Internet research,17(10).*

- Tourangeau R. Cognitive science and survey methods: a cognitive perspective. In: Jabine T, Straf M, Tanur J, Tourangeau R, eds. Cognitive Aspects of Survey Design: Building a Bridge between Disciplines. Washington, DC: National Academy Press; 1984:73–100.

- Van den Haak MJ, De Jong MD, Schellens PJ. Evaluation of an informational web site: three variants of the think-aloud method compared. *Tech Commun. 2007;54(1):58–71.*

- Willis, G. B., & Artino Jr, A. R. (2013). What do our respondents think we're asking? using cognitive interviewing to Improve Medical Education surveys. *Journal of graduate medical education*, *5*(3), 353-356.

- Willis G. Cognitive aspects of survey methodology. In: Lavrakas P, ed. Encyclopedia of Survey Research Methods. Vol 2. Thousand Oaks, CA: Sage Publications; 2009:103–106.

- Willis G (2005). Cognitive Interviewing. A Tool for Improving Questionnaire Design. Thousand Oaks, CA: Sage Publications.