

Research Methods in CSAI

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OBSERVATION - THINKING ALOUD

What is the 'think aloud' technique?

- Technique for gathering data about thought processes underlying problem solving
- Record verbalisations, transcribe, segment, analyse ...
- Research (Ericsson & Simon, 93) indicates that asking participants to 'think aloud' as they do a task does not disrupt their thought processes...
- Used in cognitive psychology research for 20 years
- Used in software engineering research (see review - Hughes & Parkes, 2003)

Why use 'think aloud' method ?

- Interviews and questionnaires are retrospective – they rely on memory - participants can rationalise their behaviour after the event...distortions can occur
- Think aloud is detailed and 'in the moment'
- Reveals individual differences in reasoning and problem solving

Difficulties with 'Think Aloud'

- Data is often messy, unclear and unstructured
- Transcription can be very difficult and time-consuming
- Need to have a sound method of correlating what is happening to what is being said
- Often needs to be followed up to clarify unclear comments and prevent assumptions

Capturing think aloud protocols

- Avoid asking participants to *explain* their thoughts – this can be very disruptive
- Could ask participants to comment on their thinking *retrospectively* as they and you watch a video playback
 - 'and what were you thinking at this point...'
- Dialogue between two participants is perhaps a more 'natural' way of capturing data on thinking and reasoning processes?

INTERVIEWING

Why use interviews?

- Useful for investigating issues in an in-depth way
- Good for addressing topics which people may feel uncomfortable discussing in a focus group
- Interviewees are not influenced by others in the group
- Can be used to deepen understanding and explain statistical data
- Help discover how individuals think and feel about a topic and why they hold certain opinions
- Ambiguities can be clarified and incomplete answers followed up

Difficulties with interviews

- They can be very time-consuming
 - setting up, interviewing, transcribing, analysing, feedback, reporting
- Different interviewers may understand and transcribe interviews in different ways
- No single approach to follow
- Saturation issues
- What people say they do may differ from what they 'actually' do

Interview Tips

- Decide in advance whether you plan for a structured, semi-structured, or unstructured interview approach, and plan accordingly
- Make sure you follow your plan consistently
- Show interest in what's being said
- Don't fuss over the next question
- Don't fill gaps with chat
- Be aware that some people may think they are betraying trust, trade secrets
- Repeat the last sentence

Types of Questions

- Descriptive Questions
 - ‘Grand Tour’ questions
 - Example & Experience questions
 - Examples:
 - What do you do at the office?
 - Could you describe the conference?
- Structural Questions
 - Verification
 - Cover and clarify terms / categories
 - Examples:
 - What types of transport do you use?
 - What stages do you go through to get promoted?

Interviewing

- Interviewing in pairs
- Write 5 questions in order to explore your partner's "Travel Experiences"
- Interview each other for 10 minutes each.
- See how it feels to interview and be interviewed
- Make notes on the experience to feed back to the class

Qualitative Analysis

- Subjective evaluation techniques
- Normally uses 'coding' techniques
- Generally claim that there is no 'correct' singular interpretation which could be placed on any data set
- Emphasis is instead on transparency, plausibility, and persuasiveness of interpretations
- Such approaches normally use a richer and more complex data set in order to investigate and explore a target domain

Qualitative Analysis

- Many different types of qualitative data analysis, e.g.:
 - Conversation Analysis
 - Discourse Analysis
 - Grounded Theory
 - Narrative Analysis
 - Ethnomethodology
- Each technique is founded on a different theoretical perspective, epistemology or interest area, and applies its techniques based on this fact.

Criteria (Hammersley)

- The degree to which generic/formal theory is produced
- The degree of development of the theory
- The novelty of the claims made
- The consistency of the claims with empirical observations, and the inclusion of representative examples of the latter in the report
- The credibility of the account to readers and/or to those studied
- The extent to which the findings are transferable to other settings
- The reflexivity of the account

Research MUSTS

- Be clear on your research question
- Clarify the constraints imposed by the context of your research
- Make sure you are using the appropriate technique(s) to address your research
- Document your thoughts (theoretically and methodologically)
- You will make mistakes
- Don't be afraid to ask for help