Human-Computer Interaction

Qualitative Data Analysis

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Today's Agenda

» Topic overview: *Qualitative Data Analysis*

» Hands-on activity

Qualitative Data Analysis Mehtods

- Content analysis
- Discource analysis
- Narrative analysis
- Thematic analysis
- **Grounded Theory**

What is Grounded Theory?[1][2]

- An *approach* to describe relationships where little is known or to provide a fresh take on existing knowledge
- A *method* to systematically build integrated sets of concepts from systematically obtained empirical data
- A *process* of composing knowledge through intimate contact with subjects and events under study
- A *theory* that is shaped by data as well as by the researcher

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[1] Glaser, B. G. and Strauss, A. The Discovery of Grounded Theory. Aldine DeGruyter, 1967.

[2] Strauss, A. L. and Corbin, J. Basics of Qualitative Research. Sage Publications, 1990.

What are key characteristics of Grounded Theory?

- **Induction:** Theory emerges from data.[3]
- **Fit:** Theory generated must:
  - *Fit* the data: categories should emerge from the data; data should not be forced into pre-existing categories.
  - Be *relevant*: theory should explain, interpret, predict phenomena.
  - be *adaptable*: theory should be modifiable based on new data.
- **Subjectivity:** Subjectivity can be minimized by (1) keeping an open mind, thinking comparatively, studying multiple viewpoints, and perdiodically asking big picture questions; (2) inter-rater reliability.

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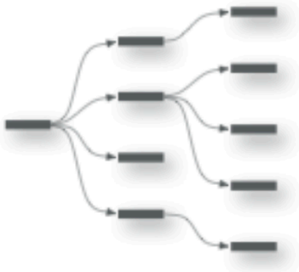
[3] *Inductive* approaches to research aim to generate theory, and *deductive* approches to research aim to test theory.

How do we conduct Grounded Theory?

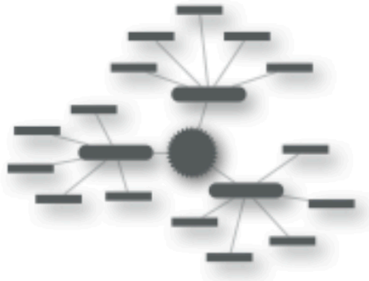
- Reading a textual database, including fieldnotes, interview transcripts, and other data that is translated into textual form
- Discovering and labeling variables
- Identifying and modeling relationships

The Grounded Theory Process

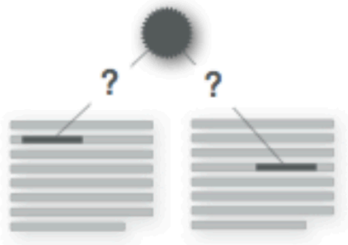
Open Coding



Axial Coding



Selective Coding

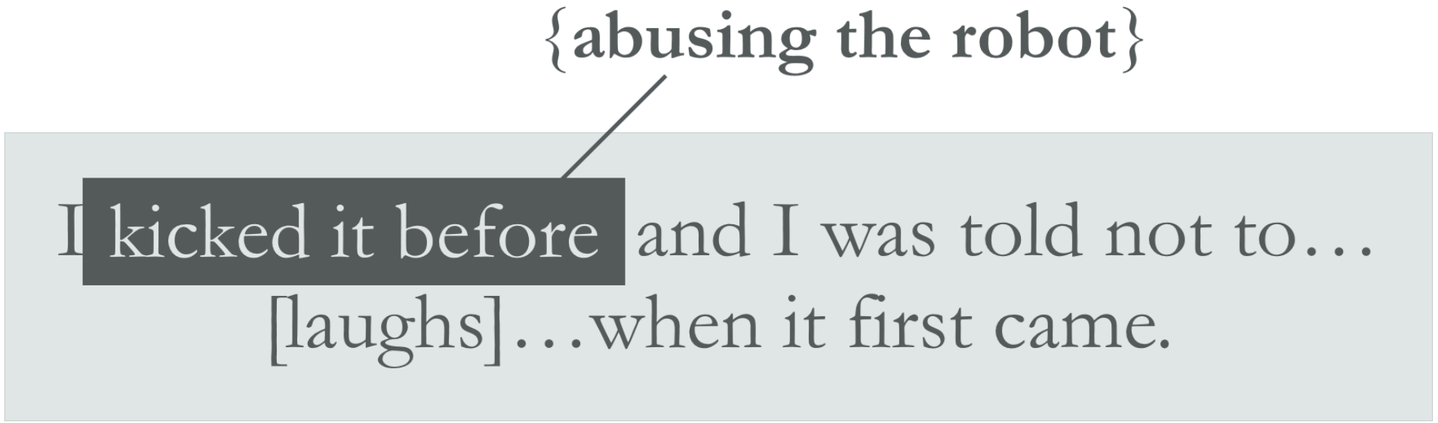


Comparative Analysis

Theory Building

Open Coding[4]

Codinbg for concepts that are significant in the data as abstract representations of events, objects, relationships, interactions, and so on.



[4] Mutlu, B. & Forlizzi, J. (2008). Robots in Organizations: Workflow, Social, and Environmental Factors in Human-Robot Interaction.

How do we ensure objectivity of coding?

Reliability analysis measures the extent to which independent coders evaluate a behavior to reach the same conclusion.

What are some measures of reliability?

- *Agreement among coders*: Measures how much coders agree as percentage of coded segments
- *Cohen's* κ: Takes into account agreement could happen by change
- *Fisher's* κ, *Krippendorff's* α: Alternatives to Cohen's κ

How do we calculate Kappa?

$$\kappa = \frac{P(a) - P(e)}{1 - P(e)}$$

κ: Cohen's Kappa

$P(a)$: Probability of *observed* agreement

$P(a)$: Probability of *chance* agreement

How do we interpret Kappa values?

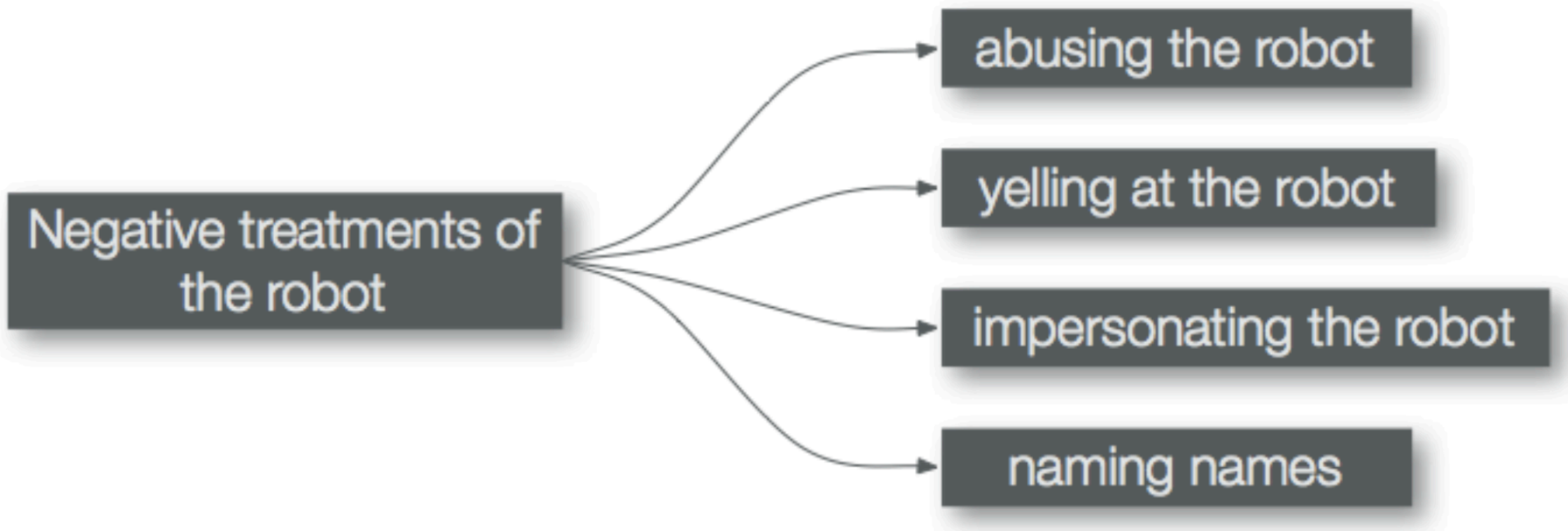
- < 0 no agreement
- 0–.20 slight
- .21–.40 fair
- .41–.60 moderate
- .61–.80 substantial
- .81–1.00 almost perfect

What process do we follow to test reliability?

1. Choose your measure (e.g., Cohen's κ)
2. Determine minimum level of reliability ($\kappa \geq .80$)
3. Identify your *reliability sample* (e.g., 10% of the full sample)
4. Train at least two coders and ask them to code the reliability sample
5. Calculcate reliability (iterative process: retrain, recode, recalculate)
6. Report inter-rater reliability

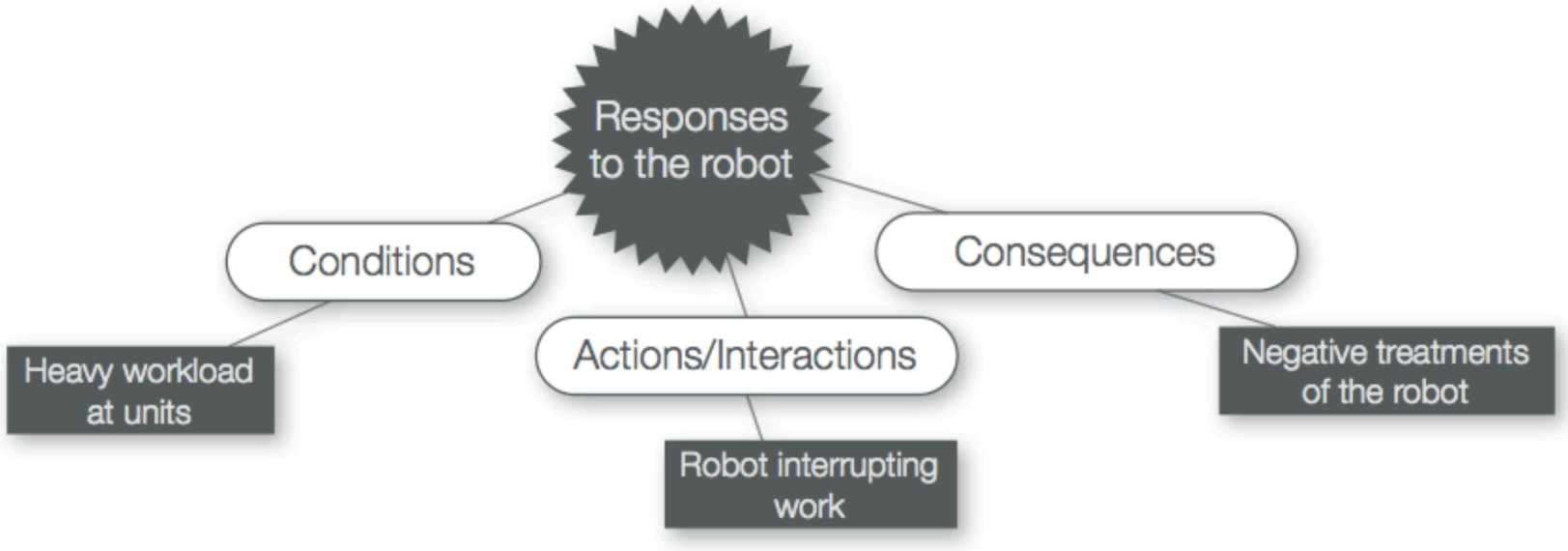
Axial Coding

Concepts are categorized into explanations of arising phenomena (e.g., repeated events, actions, interactions)



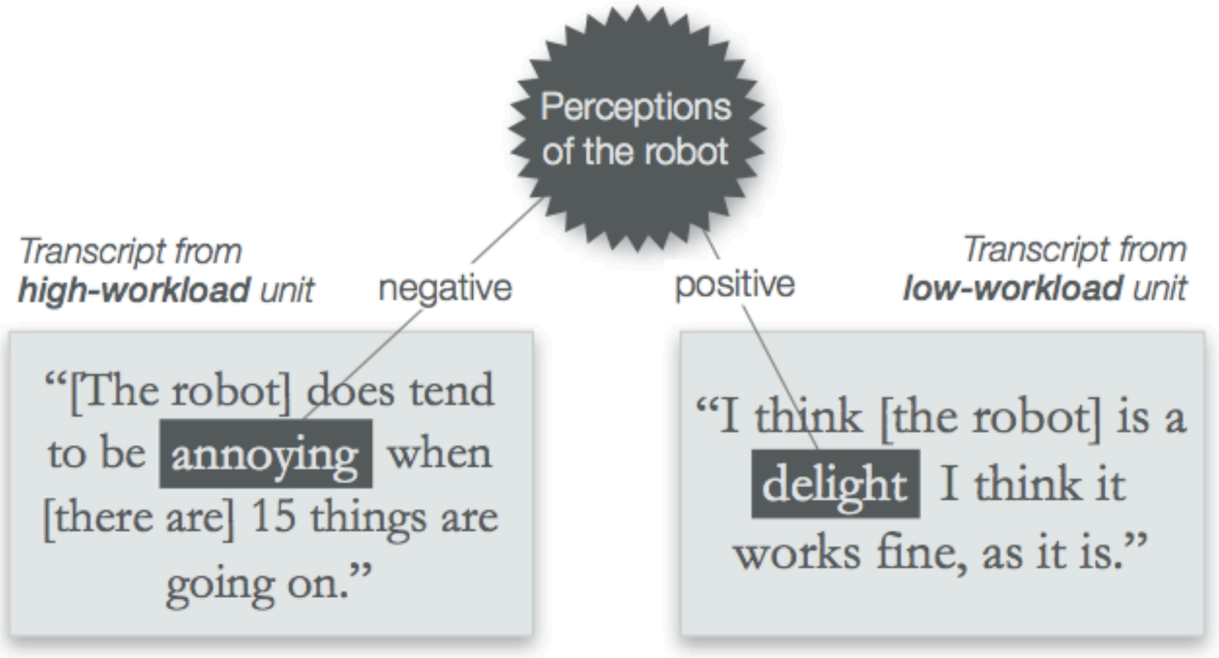
Selective Coding

Categories are classified into *conditions*, *actions/interactions*, and *consequences* and relationships among categories are established to generate several individual models.



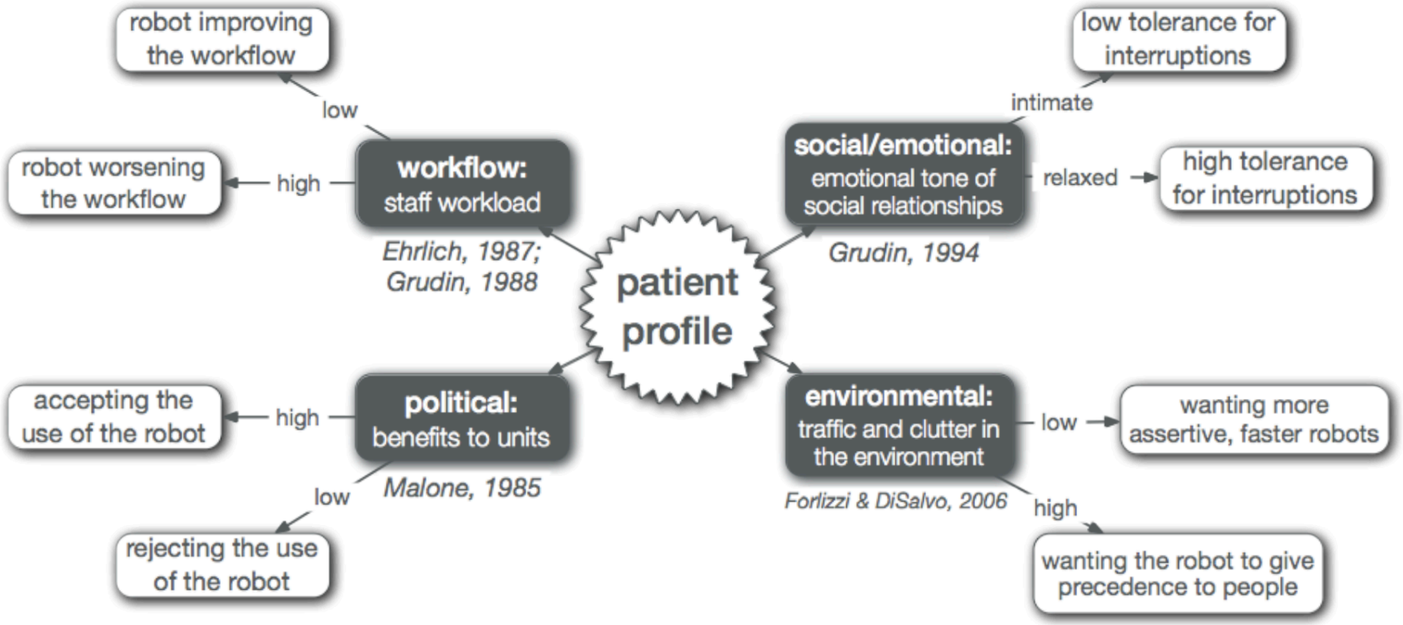
Comprative Analysis

Each phenomenon is compared across several dimensions to understand how it is affected by social, physical, or organizational structures.



Theory Building

A final theoretical model is constructed based on the results of the comparative analysis; existing theory is embedded in this model.



Recap of the Grounded Theory Process