



# Coding

Fundamentals of Human-Centered Computing



# Coding

Today I will cover various types of coding:

- Initial/open coding
- Axial coding
- Focused/selective coding
- Theoretical coding



# Initial coding

Highlighting interesting things in your data



# Initial coding

Codes **connect** fragments of data with the **analytic abstraction** that we accord to them

Keep the detail, but move towards a more abstract interpretation

Your real insights are never exactly what the participant said

Rather, an abstraction that **makes sense** of what several participants said

Like **brainstorming** the meaning of your data

Initially anything goes, later on we focus



# Line by line

Go through the transcript **line by line** (even word by word)

Assess, compare, question, and hypothesize about each sentence!

This critical reflection helps **avoid preconceptions**

Do this also for your observations!

This is why you should take ample notes!

You would typically do this type of analysis on your own



# Compare incidents

You can also **compare similar incidents** while coding

This is called incident-with-incident

Eventually, also compare incidents that are less similar

This works especially well with notes you take while observing **behavior**

This method reveals **patterns** and **contrasts**

Useful to tease out dimensions and properties

You would typically do this type of analysis in a group



# Outcomes

Your initial coding will result in:

- **Concepts:** happenings, events, or other instances of phenomena (e.g. “picking”, “choosing”, “selecting”, “deciding”)
- **Categories:** concepts grouped by phenomena (e.g. “choice”)
- **Properties and dimensions:** aspects of a category that are mentioned, and possible values of these aspects (e.g. “difficulty: easy – hard”)



# Concepts

What are good concepts to focus on?

Actions, processes, feelings, events, situations

Their label should be an action (gerund)!

What is a good way to produce them?

- Digital method: Put your transcript into a two-column table (one row per paragraph); then put the text in one column, codes in the other
- Paper method: print your transcript with a large margin on one side, annotate in the margin





# Categories

How do I get categories?

Through a comparison and aggregation of concepts

They often represent meanings, tacit assumptions, or implicit actions

What is a good way to produce them?

Write them in a certain color, and then highlight concepts with the color of the category they belong to



# Dimensions

How do I get dimensions and properties?

Try and find evidence on variations in a category

Describe the dimensions of variation and the different values

What is a good way to produce them?

You can write them as an “arrow” in the color of the category: [easy] <— difficulty —> [hard]



# In vivo codes

Sometimes participants' own words can become central codes

- They use a significant term that everyone knows
- They coin a relevant new term
- They provide a concise description of a category or theory

Such **in vivo** codes are powerful rhetoric tools in writing

Your theory can explain them further



# Tips

Codes are our **view** of the data, not ultimate truth!

Codes are **provisional**

Change them entirely, change the wording, or break them up as needed (e.g. is it choice or decision?)

Codes are not themes, but **categories**

Each theme becomes a process in itself



# Tips

Remain open

Go back to already-coded data if needed!

Use short, simple codes

Preserve actions; don't abstract too much

Compare

between events, participants, with your own expectations

Go quick

This is brainstorming



# Tips

Code for Fit (is it real) and Relevance (does it matter)

Highlight any gaps in your understanding

This will guide your data collection

Note: Charmaz doesn't explicitly use categories, dimensions, and properties

I think they are a useful transition between open and axial/focused codes, though



# Axial coding

Highlighting relationships in your data



# Axial coding

Axial codes describe how the dimensions of two or more categories relate to each other:

- Limited interaction -> second-hand news -> feeling left out
- Geographical OR emotional distance -> delaying disclosure
- Having many options -> difficult choice -> lower satisfaction

Axial coding will start happening naturally during your initial coding





# Axial coding

How do I get axial codes?

Take two dimension and relate them

This can be done across categories, across incidents, and across participants

What is a good way to produce them?

Mind maps, drawings, or sticky notes

Start alone (during line-by-line), finish as a group (during incident-with-incident)



# Tips

Note: Charmaz doesn't like Axial Coding very much

She thinks that it's forced

I think it can be a useful tool

But don't overdo it



# Focused coding

Elevate important codes to theories



# Focused coding

Focused codes allow you to choose and label the most important codes

Example: Having many options -> difficult choice -> lower satisfaction

Focused code: “choice overload”

Focused codes are on a higher theoretical level

These are likely going to be the sections of your paper!



# Focused coding

How do I get axial codes?

Pick categories or groups of categories (created via axial coding) that have some theoretical importance

AND/OR group categories into clusters and pick the most relevant ones

What is a good way to produce them?

These need to come out of a group discussion

The clusters can be created using sticky notes or code print-outs



# Tips

At this point, it is important to avoid preconceptions!

Avoid the following:

- Coding at too general a level of abstraction
- Identifying topics instead of actions/processes
- Using too many of your own words and ideas rather than the participants'
- Focusing on the system rather than the user



# Theoretical coding

Reaching out to extant theory



# Theoretical coding

Theoretical coding is the point where Grounded Theory starts to become less grounded

It links your focused codes to extant theory (or theory type)

Example: “choice overload” can be seen as a “cause of decision bias”

Decision bias is a higher theoretical concept that many other researchers also use





# Theoretical coding

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<b>Coding families</b>	<b>Concepts</b>
The Six Cs	Causes, contexts, contingencies, consequences, conditions
Process	Stages, phases, phasings, transitions, passages, careers, chains, sequences
The Degree Family	Extent, level, intensity, range, amount, continuum, statistical average, standard deviation
Type Family	Types, classes, genres, prototypes, styles, kinds
The Strategy Family	Strategies, tactics, techniques, mechanisms, management
Interactive Family	Interaction, mutual effects, interdependence, reciprocity, symmetries, rituals
Identity-Self Family	Identity, self-image, self-concept, self-evaluation, social worth, transformations of self
Cutting-Point Family	Boundary, critical juncture, cutting point, turning point, tolerance levels, point of no return
Cultural Family	Social norms, social values, social beliefs
Consensus Family	Contracts, agreements, definitions of the situation, uniformity, conformity, conflict

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