

Introduction to HCI

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Qualitative Data Analysis

Thematic Analysis

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Logistics

- ▶ Milestone 1
- ▶ Important dates
 - ▶ October 12 – Submit presentation in Gradescope
 - ▶ October 14 – In-class presentation
 - ▶ October 19 – Submit report in Gradescope
- ▶ The presentation should be a mini version of the report

Presentation guidelines

- ▶ <https://blog.hubspot.com/marketing/5-minute-presentation>
- ▶ <https://drive.google.com/file/d/1hVeuBGOkV4rGTQhEsYjovJ0EzpA2bVaD/view?usp=sharing>

Learning goals

- ▶ Understand theme-based approaches to analysis
- ▶ Understand thematic analysis as one of the most common forms of analysis and describe how to do thematic analysis in detail
- ▶ Understand why reliability and validity are important in qualitative research
- ▶ Make and justify strategic decisions in evaluation planning

Types of data that HCI methods provide

▶ Qualitative:

- ▶ Users describe/report X, to extent they are aware
- ▶ You observe X, that users may not be fully aware of
- ▶ Where X can be behaviors, processes, usability challenges...

▶ Quantitative:

- ▶ Measure task performance with existing tools / methods:
 - ▶ e.g., Speed, errors, dead-ends, learning curves for novices ...
- ▶ Numerical data from user-reported answers: e.g., # of emails/day
- ▶ Counting observed occurrences: e.g., # of times looked at instruction

Analyzing & interpreting data

- ▶ **Qualitative data** – interpreted to tell a “story”
 - ▶ Categories, themes, patterns, etc.
- ▶ **Quantitative data** – presented as values, tables, charts and graphs
 - ▶ Counts (e.g., Summary of total # of errors)
 - ▶ Simple statistical analysis (e.g., Averages)
 - ▶ Advanced statistical analysis (e.g., Linear regression)
... more on quantitative coming later this term.

Methods for qualitative analysis

- ▶ From simpler (less effort) to more advanced (more effort):
 - ▶ Identify critical incidents
 - ▶ Simple categorization
 - ▶ Categorization - themes, patterns
- ▶ In all cases your aim is to interpret the data in ways that encapsulate and document your understanding
- ▶ Level of effort depends on your goal
- ▶ Many methods often used in combination

Qualitative analysis methods: patterns and themes

- ▶ Can be revealed in many ways:
 - ▶ Through the process of conducting the study
 - ▶ Use of tools and techniques
- ▶ Can support many types of user study goals
 - ▶ E.g., Understanding behavior, culture, places or situations where events occur, breakdowns, user characteristics, etc.
- ▶ Very flexible and widely used
 - ▶ Can be reported as findings or inform more analysis

Thematic analysis

- ▶ Thematic analysis is one of the most common forms of analysis in qualitative research.
- ▶ It is a method for identifying, analyzing and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail.

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Inductive vs. deductive thematic analysis

- ▶ Inductive or 'bottom up' way

- ▶ Data-driven; process of coding the data without trying to fit it into a preexisting coding frame, or the researcher's analytic preconceptions

- ▶ Deductive or 'top down' way

- ▶ Analyst driven; driven by the researcher's theoretical or analytic interest in the area

Doing thematic analysis: a step-by-step guide

- ▶ Familiarizing yourself with your data
- ▶ Generating initial codes
- ▶ Searching for themes
- ▶ Reviewing themes
- ▶ Defining and naming themes
- ▶ Producing the report

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1. Familiarizing yourself with your data

- ▶ Transcribing data, reading and re-reading the data, noting down initial ideas
- ▶ **Note:**
 - ▶ Writing is an integral part of analysis
 - ▶ Analysis is not a linear process
 - ▶ Read through the entire data set before you begin your coding

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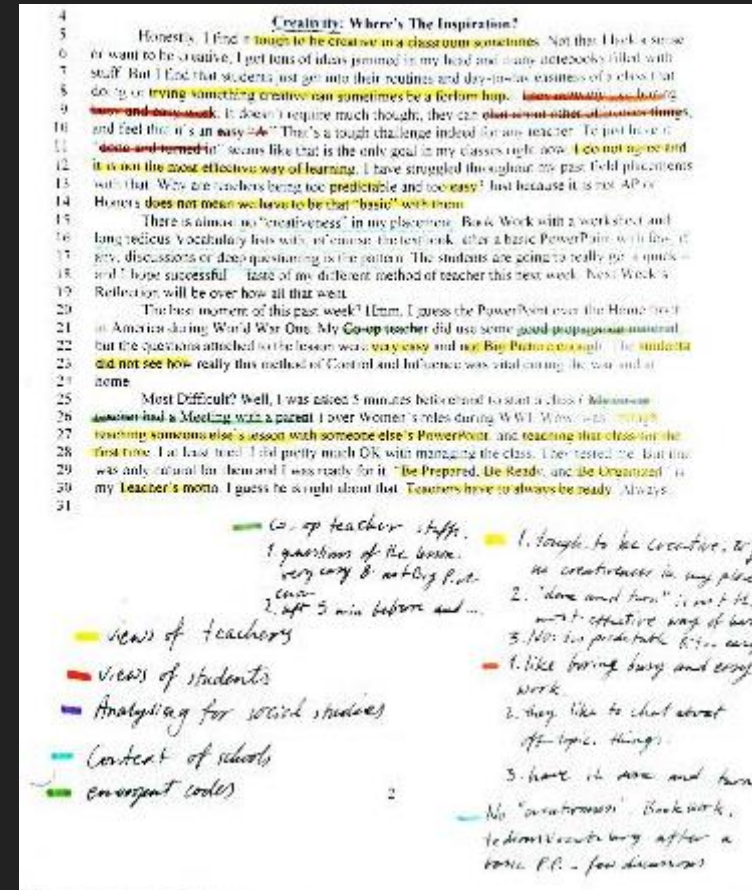
2. Generating initial codes

- ▶ Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code
 - ▶ Your coded data differ from the units of analysis (your themes), which are (often) broader
 - ▶ Coding will, to some extent, depend on whether the themes are more 'data-driven' or 'theory-driven'

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Coding manually

- ▶ Code your data by writing notes on the texts you are analyzing, by using highlighters or colored pens to indicate potential patterns, or by using 'post-it' notes to identify segments of data. Key advice for this phase is:
- ▶ Code for as many potential themes/patterns as possible
- ▶ Code extracts of data inclusively / i.e., Keep a little of the surrounding data if relevant



Coding with computer software

- ▶ If using computer software, you code by tagging and naming selections of text within each data item
- ▶ NVivo: <http://www.qsrinternational.com/nvivo-product>
- ▶ ATLAS.ti: <http://atlasti.com>
- ▶ Saturate App: <http://www.saturateapp.com>

3. Searching for themes

- ▶ Collating codes into potential themes, gathering all data relevant to each potential theme
- ▶ Analyze codes and consider how different codes may combine to form an overarching theme
- ▶ It may be helpful at this phase to use visual representations to help you sort the different codes into themes. You might use tables, or mind-maps, or write the name each code

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4. Reviewing themes

- ▶ Checking if the themes work in relation to the coded extracts and the entire data set, generating a thematic 'map' of the analysis
- ▶ Goal:
 - ▶ To ascertain whether the themes 'work' in relation to the data set.
 - ▶ To code any additional data within themes that has been missed in earlier coding stages
- ▶ Note:
 - ▶ Data within themes should cohere together meaningfully, while there should be clear and identifiable distinctions between themes

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5. Defining and naming themes

- ▶ Identify the 'essence' of what each theme is about
- ▶ Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
- ▶ Identify whether or not a theme contains any sub-themes
- ▶ Give names to the themes

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6. Producing the report

- ▶ The final opportunity for analysis
- ▶ Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis
- ▶ It is important that the analysis (the write-up of it, including data extracts) provides a concise, coherent, logical, non-repetitive and interesting account of the story the data tell / within and across themes

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Example of Thematic Analysis

- ▶ Consider Mooglee, a startup that developed a new search engine
- ▶ This search engine allows people to search by taking pictures of any object or text
- ▶ It also tracks a user's facial expression while searching to adjust the search results
- ▶ Mooglee collected open-ended comments on what users think about their new search engine
- ▶ They want to analyze the comments using Thematic Analysis

Example of Thematic Analysis

I think this new search engine **is useful**. The results are **spot on!** Exactly what I wanted to know when I searched for things. But **I am not sure** if I like the whole idea of **using a camera to search**. I could have **just typed** **like other search engines**. Also, it's not just one camera. **You will need 2!** Because it scans your face before searching. **I don't know why** they need to do that! It seems **a little invasive**. I **don't know if** I want the **search engine to look** at my face every time I am searching for things online.

Useful

Accurate

Unsure

Camera

Typing

Search

Camera

Confusion

Invasive

Uncertain

Intrusion

Example of Thematic Analysis

This has to be one of the coolest new tech out there. I love that I can point at anything and search what it is! The results are hit and miss though. But I don't care. I am sure they will improve gradually. Love the face tracking and result adjustment! This is the future! Some people might be put off by the camera though. Not me! I don't care about privacy. I think we should also have a voice input with the face tracking thing. I think that will be even better!

Innovative

Ease of use

Accuracy

Confidence

Feature

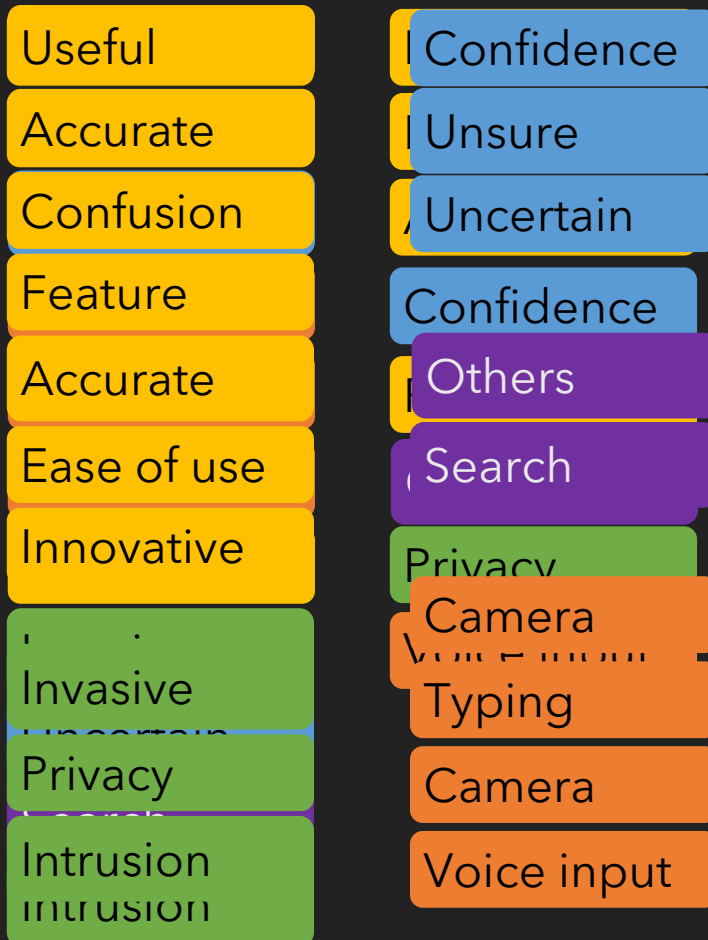
Others

Privacy

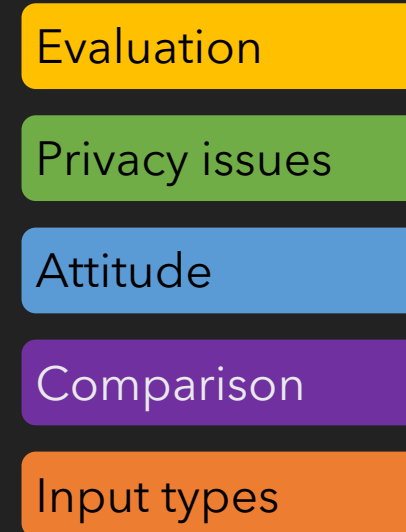
Voice input

Example of Thematic Analysis

Codes



Themes



Reliability in qualitative research

- ▶ Reliability and validity are fundamental concerns of the qualitative researchers
- ▶ Transparency of technique
 - ▶ Carefully documenting all their steps so that they can be checked by another researcher
- ▶ Reliability checker
 - ▶ Organizing an independent assessment of transcripts by additional skilled qualitative researchers and comparing agreement between the raters.
 - ▶ Can be done statistically (called inter-rater reliability) or qualitatively by discussing disagreements

In-class activity

- ▶ Work in teams
- ▶ Given two transcripts from a research study about “How do people approach digital data preservation? How do they decide what to keep and discard?”, conduct thematic analysis of the data by following the step-by-step guide described in the lecture
- ▶ Link to the worksheet - <https://tinyurl.com/bycmkv89>
- ▶ Link to Google Slides - <https://tinyurl.com/22xwtpy3>

Additional Information

Advantages of thematic analysis

- ▶ Flexibility
- ▶ Relatively easy and quick method to learn, and do
- ▶ Accessible to researchers with little or no experience of qualitative research
- ▶ Results are generally accessible to educated general public
- ▶ Can usefully summarize key features of a large body of data, and/or offer a 'thick description' of the data set
- ▶ Can highlight similarities and differences across the data set
- ▶ Can generate unanticipated insights
- ▶ Allows for social as well as psychological interpretations of data

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Pitfalls to avoid when doing thematic analysis

- ▶ Failure to actually analyze the data
 - ▶ Thematic analysis is not just a collection of extracts strung together with little or no analytic narrative
- ▶ Using of the data collection questions (such as from an interview schedule) as the 'themes' that are reported
- ▶ A weak or unconvincing analysis
 - ▶ Where the themes do not appear to work, where there is too much overlap between themes, or where the themes are not internally coherent and consistent
- ▶ A mismatch between the data and the analytic claims that are made about it.
 - ▶ The claims cannot be supported by the data

Optional reading

- ▶ How to do Thematic Analysis

- ▶ <https://www.scribbr.com/methodology/thematic-analysis/>

- ▶ Applied Thematic Analysis

- ▶ <https://drive.google.com/file/d/1L9u-nNN1vwLukUpcvpMzc9jHcCUJW18P/view?usp=sharing>