QUALITATIVE DATA ANALYSIS

CPCS 544 FUNDAMENTALS IN DESIGNING
INTERACTIVE COMPUTATION TECHNOLOGY FOR PEOPLE

CLASS 7 – 2023W1

TODAY'S AGENDA

- Activity: Mock interview [20 min]
- Approaches to qualitative analysis
- Issues of reliability and validity
- Doing it: basic steps & elements
- Activity: Hands-on coding [15 min]
- Practicalities & examples

LEARNING GOALS

- What **types of data** do HCI methods generate?
- What are some different approaches to **analyzing qualitative data**?
- How do we **code and analyze qualitative** data?
- What does it mean to **triangulate** in data gathering and analysis?
- What is **reliability and validity** in qualitative research?

MOCK INTERVIEWS

- Activity:
  - Role play interviewer/interviewee using a few prescribed questions
  - Conduct a **section** of an interview
    (think about: what are we leaving out?)
- Why are we doing this?
  - Set context for **today's class on qualitative analysis**
  - Provide material for **upcoming** class on **developing personas**
  - Try out **using field work data in different ways** to inform your team projects
  - **Practice** interviewing

Input data via Qualtrics survey:
Link on IntSched + Slack/#lectures
Password: class06

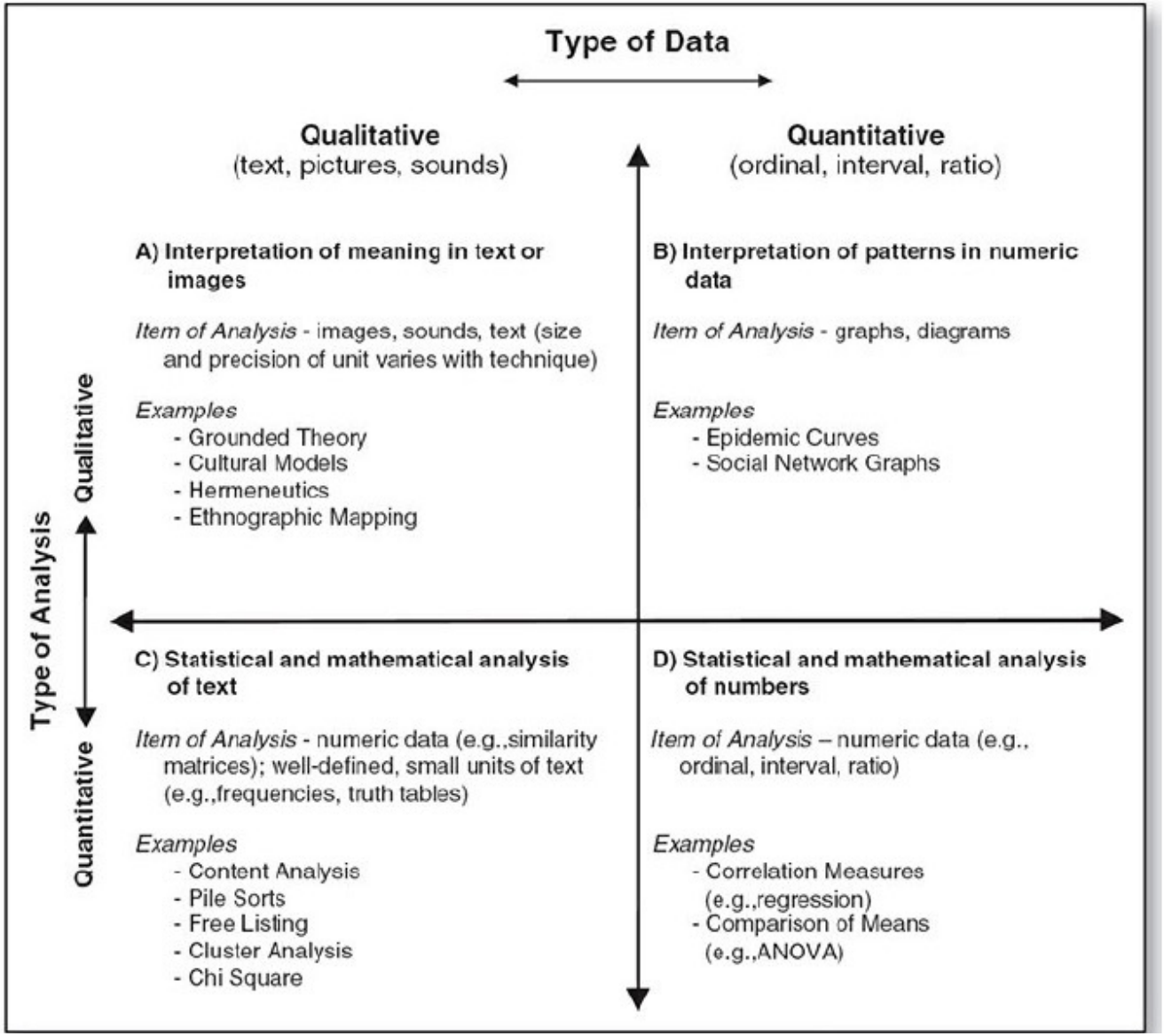
MOCK INTERVIEW INSTRUCTIONS: 20 MIN

- Get into **pairs**
- Select 1st round roles (interviewer and interviewee).
- Interviewer **asks** the 3 questions, and **records the gist** of the interviewee's response in **short form notes** in the text box on the survey.
- **10 min** (~3 min/question) *we'll adjust as needed*
- **Switch roles:** Create a new survey instance.

Tip:

- See **prompts** -- in case interviewee needs assistance articulating their response.

Figure 1.1 Qualitative and Quantitative Data Analyses



Guest, McQueen & Namey, 2014, p. 5

APPROACHES TO QUALITATIVE ANALYSIS

SELECTING AN APPROACH

- What kind of data did you collect?
  - Interview, survey, observation, print media
- In what format is your data?
  - Text (verbal, print, electronic), images
- What is the purpose of your study?
  - Describe a phenomenon?
  - Validate or extend a theory or framework?
  - Discover meaning of words or content?
- What is the extent of literature on your topic?
  - A little, some, a lot

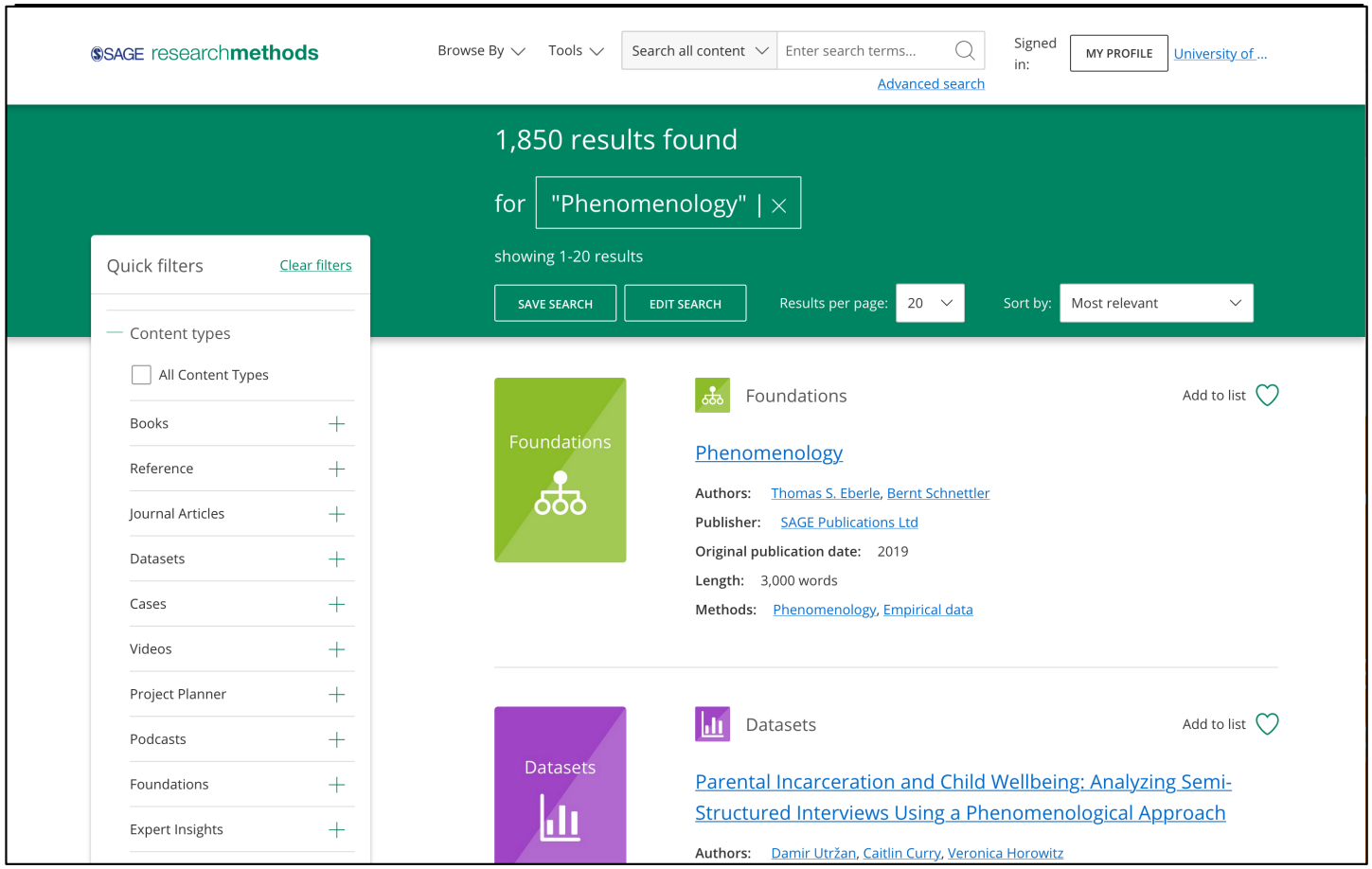
Reflect on today's reading
Halbert & Nathan...

INDUCTIVE VS. DEDUCTIVE ANALYSIS

- **Inductive** (emergent or 'bottom up')
  - Data-driven; process of coding the data without trying to fit it into a preexisting coding frame, or the researcher's analytic preconceptions
- **Deductive** (a priori questions or structure; theoretical, or 'top down')
  - Driven by the researcher's theoretical or analytic interest in the area

Can these approaches be used in concert? How?

MANY DIFFERENT APPROACHES!



- Grounded Theory
- Ethnography
- Phenomenology
- ...many more!

To learn more, a good resource:

UBC Library
→ Indexes and Databases
→ Sage Research

https://methods.sagepub.com/

CONTENT ANALYSIS

- "…a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns."
- Three approaches
  - Conventional
  - Directed
  - Summative
- Differ by: **coding schemes**, **origins of codes**, & **threats to reliability.**

Consider (next slides):
Which of these are **inductive**, **deductive**?
What role does **theory** play in each?
What are their **value** and **vulnerability**?

Hsieh, H-F., Shannon, S.E. (2005). Three approaches to content analysis. *Qualitative Health Research, 15*(9).

CONVENTIONAL CONTENT ANALYSIS

- Used when:
  - The researcher wants to ***describe*** a phenomenon
  - There is **limited literature** or theory on the topic
  - The researcher allows the categories/names of categories to **emerge** from the data

Strengths, Limits?
What's the difference between this and Grounded Theory, another well-known **inductive** approach?

DIRECTED CONTENT ANALYSIS

Starts with a theory or framework as guidance for initial codes;
goal is to validate or conceptually extend the theory/framework.

- Used when:
  - **Previous research** and theory has informed the research question
  - **Previous work is incomplete**, or could be extended
  - A **deductive** approach is appropriate
    - **Theory is used to guide**: initial ideas about what the variables are and how they relate

What does this look like – how do you start?
What is this method's biggest vulnerability?

SUMMATIVE CONTENT ANALYSIS

Counting and comparisons, usually of keywords or content (quantitative); critically, followed by the interpretation of the underlying context

- **Manifest** content analysis: exploring the **usage of a particular word or content in text**

  (Potter & Levine-Donnerstein, 1999, as cited in Hsieh & Shannon, 2005, p. 1283)

- **Latent** content analysis: "the process of interpretation of content"

  (Holsti, 1969, as cited in Hsieh & Shannon, 2005, p. 1283-1284).

Inductive or deductive?
Theory?

EXAMPLE OF SUMMATIVE:

Fox News uses the word 'hate' much more than MSNBC or CNN

September 28, 2020 3.36pm EDT

Tucker Carlson is a big fan of the phrase 'they hate.' Usually, he's talking about Democrats. YouTube

`Fox News is up to five times more likely to use the word "hate" in its programming than its main competitors, according to our new study of how cable news channels use language.

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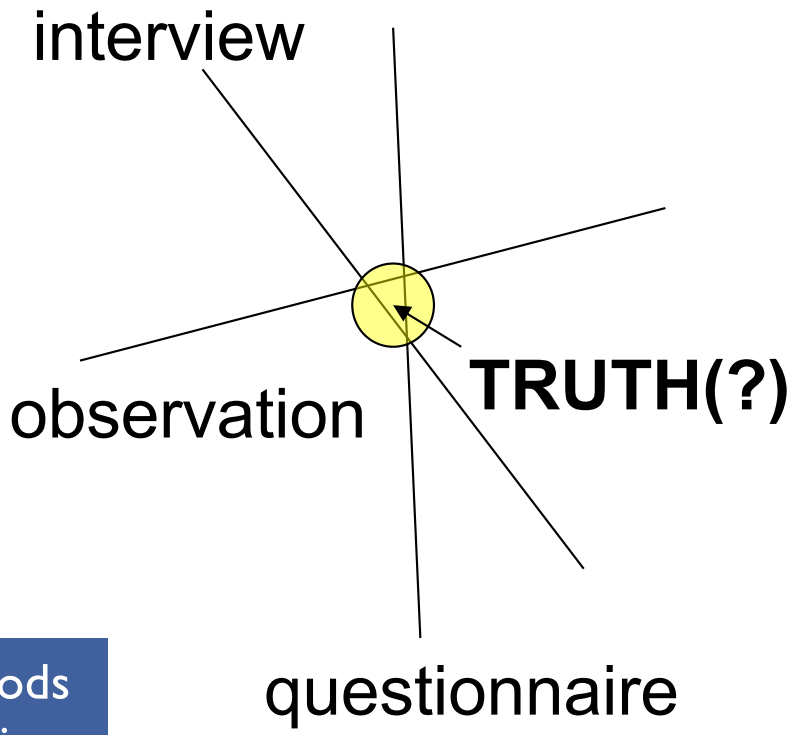
Partners

View all partners

TRIANGULATION

- A strategy to enhance validity: use the multiple perspectives available from **complementary views**
- Use multiple:
  - Data **sources** - people, places, times
  - Data collection **methods**
  - **Researchers/evaluators**



What if the data collected from different field methods would lead to conflicting coding/categories/findings in a qualitative content analysis?

RELIABILITY & VALIDITY IN QUALITATIVE RESEARCH

- Reliability and validity are fundamental concerns of the qualitative researchers (but may use different terms!)
- 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
    - Different schools of thought on need for inter-rater reliability

Is the # of coders related to amount of data?
Subjective vs. objective coders?

DOING IT: BASIC STEPS & ELEMENTS

CONTENT ANALYSIS: **BASIC STEPS**

1. Formulate the research question
2. Select sample
3. Identify categories

Big difference here for deductive vs inductive approaches

4. Sketch out coding process/training of coders (if collaborative)
5. Code (apply codes to the sample)
6. Examine trustworthiness of coding

E.g. long-term observation; checking back with experts or respondents

7. Evaluate results

Tricky bits! *The value of analysis especially rests on how well you do these steps.*

WHAT IS A **CODE**?

- Code: "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data"
  - Saldana, *A Coding Manual for Qualitative Researchers, p. 3-4*

[1] He cares about me. He has never told me but he does. [2] He's always been there for me, even when my parents were not. He's one of the few things that I hold as a constant in my life. So it's nice.	[1] SENSE OFSELF-WORTH [2] STABILITY
[3] I really feel comfortable around him.	[3] "COMFORTABLE"

WHAT IS A **CATEGORY**? A **THEME**?

- A family of codes that share some characteristics forms a **Category**
- "A theme is an **outcome of coding, categorization and analytic reflection**"
  - Can be given a descriptive name
  - **Not your interview questions**

Note: your reading uses "themes" for narrow, and "codes" for broad categories → often you will see them used in **opposite** way (e.g, this diagram)

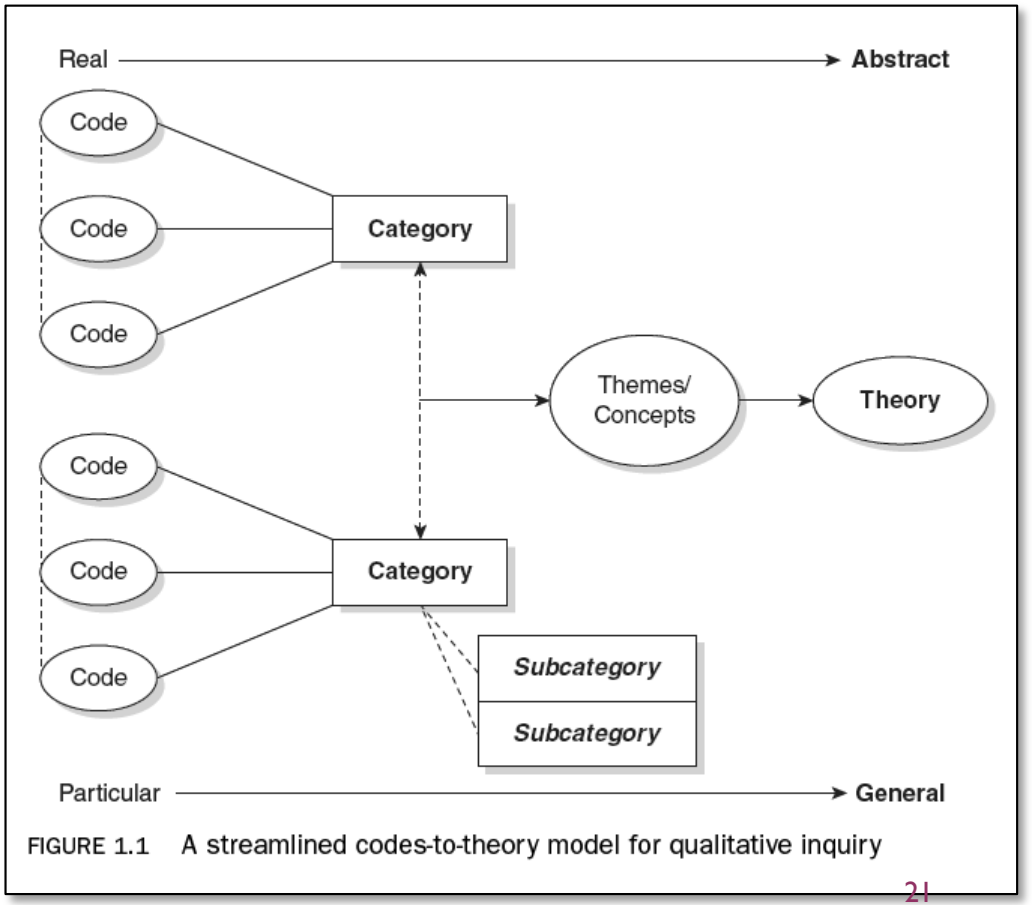


FIGURE 1.1 A streamlined codes-to-theory model for qualitative inquiry

BASIC APPROACH TO ANALYSIS

Deductive/a priori/ confirmatory:
Key concepts or variables from prior literature used to create initial coding scheme, categories ***before addressing data***

STEPS

1. Read/familiarize yourself with the data
2. Note relationships and links (codes, categories)
3. Organize codes into meaningful clusters
   - Combine sub-categories?
   - Use a tree diagram to see hierarchies
4. Identify exemplars for each code and category
5. Address relevant theories or literature in discussion

a. Create initial **coding scheme**
b. Define (or sort into) **categories**

Inductive:
Initial coding scheme flows **out of the data**, and categories are built **organically**

IN-CLASS ACTIVITY: CODING [15M]

- Return to data from the **mock interviews** we did at start of class
- Instructions:
  - Read through the **posted responses (Canvas, link on Slack)**
  - What **codes** (words, phrases) come to mind to describe what is contained in the passage?
    - *What analytical approach are we using when we do it this way?*

1. Alone: everyone write down a few examples [**5min**]
2. Together: collect & discuss [**10m**]

CODES?

FROM CODES TO CATEGORIES

Looking at the codes we've generated:

- Which ones seem to **go together**?
- What **labels** might we assign these **groupings**?

Useful technique for this: Affinity Mapping! (next class)

- Post-its on whiteboards or big sheets of paper
- Miro (or other digital versions … beware: it's a power hog)

FROM CATEGORIES TO THEME

- What higher level ideas are expressed through our categorizations?

Tips:

- Study Categories, Codes hierarchically
- Iterate at this stage – consider different categories, alternative ways of "slicing the data", seek maximal insight.

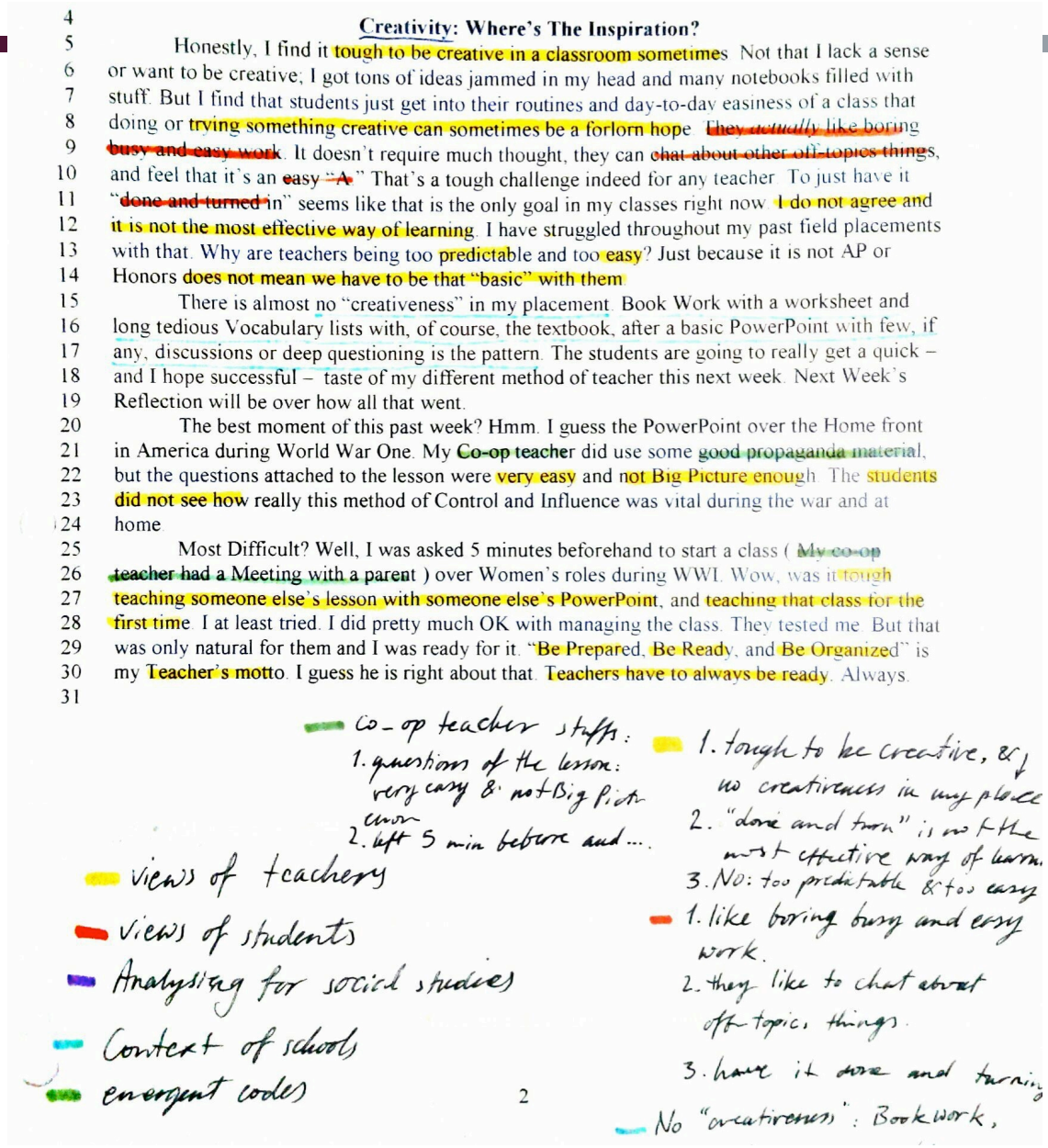
- *Is what we've just done Inductive or Deductive?*
  (just checking!)

PRACTICALITIES & EXAMPLES

QUANTITIVELY ORIENTED ANALYSES

Some different approaches to "counting" things (such as words) in qualitative data:

1. Manual or automated search for occurrences of identified words in text
2. Calculate frequency counts for identified terms
3. Identify speaker/source (count instances)
4. Explore context of usage, range of meaning of the words
5. Other types of events – such as?



Creativity: Where's The Inspiration?

Honestly, I find it tough to be creative in a classroom sometimes. Not that I lack a sense or want to be creative; I got tons of ideas jammed in my head and many notebooks filled with stuff. But I find that students just get into their routines and day-to-day easiness of a class that doing or trying something creative can sometimes be a forlorn hope. They ~~actually~~ like boring busy and easy work. It doesn't require much thought, they can chat about other off-topics things, and feel that it's an easy "A." That's a tough challenge indeed for any teacher. To just have it "done and turned in" seems like that is the only goal in my classes right now. I do not agree and it is not the most effective way of learning. I have struggled throughout my past field placements with that. Why are teachers being too predictable and too easy? Just because it is not AP or Honors does not mean we have to be that "basic" with them.

There is almost no "creativeness" in my placement. Book Work with a worksheet and long tedious Vocabulary lists with, of course, the textbook, after a basic PowerPoint with few, if any, discussions or deep questioning is the pattern. The students are going to really get a quick – and I hope successful – taste of my different method of teacher this next week. Next Week's Reflection will be over how all that went.

The best moment of this past week? Hmm. I guess the PowerPoint over the Home front in America during World War One. My Co-op teacher did use some good propaganda material, but the questions attached to the lesson were very easy and not Big Picture enough. The students did not see how really this method of Control and Influence was vital during the war and at home.

Most Difficult? Well, I was asked 5 minutes beforehand to start a class (~~My co-op teacher had a Meeting with a parent~~) over Women's roles during WWI. Wow, was it tough teaching someone else's lesson with someone else's PowerPoint, and teaching that class for the first time. I at least tried. I did pretty much OK with managing the class. They tested me. But that was only natural for them and I was ready for it. "Be Prepared, Be Ready, and Be Organized" is my Teacher's motto. I guess he is right about that. Teachers have to always be ready. Always.

2

Co-op teacher stuffs:
1. questions of the lesson: very easy & not Big Pictu
2. left 5 min before and ....

views of teachers

views of students

Analysing for social studies

Context of schools

emergent codes

1. tough to be creative, & no creativeness in my place
2. "done and turn" is not the most effective way of learn
3. NO: too predictable & too easy

1. like boring busy and easy work.
2. they like to chat about off-topic, things.
3. have it done and turning

No "creativeness": Book work,

Example of Manual

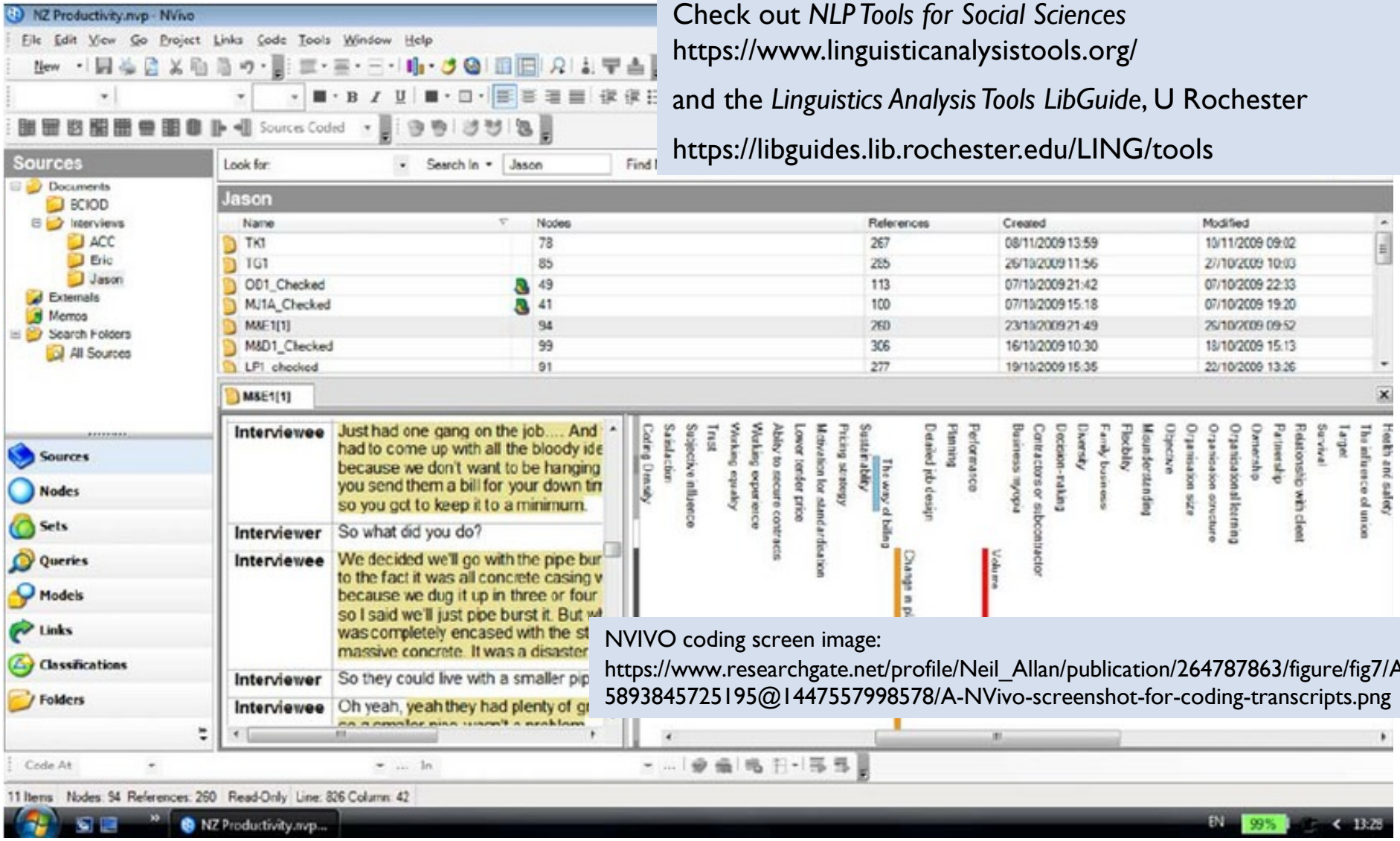
Automated, e.g. Nvivo analysis tool

Some programs allow researchers to perform text analysis.

Check out *NLP Tools for Social Sciences*
https://www.linguisticanalysistools.org/

and the *Linguistics Analysis Tools LibGuide*, U Rochester

https://libguides.lib.rochester.edu/LING/tools



NVIVO coding screen image:
https://www.researchgate.net/profile/Neil_Allan/publication/264787863/figure/fig7/AS:295893845725195@1447557998578/A-NVivo-screenshot-for-coding-transcripts.png

TIPS

- **Visual representations** (tables, concept maps, tree diagrams) can help organize codes, categories and themes
- Qualitative analysis involves **reviewing the themes to determine if they "work",** i.e., codes/categories within themes should be coherent, themes should be distinct and capture the big ideas you saw
- Writing up the data:
  - **Selection** of vivid, compelling examples
  - **Analysis** of selected extracts that relate back to the research question(s) and literature
  - Not just a report of the data **but a story**

Halbert and Nathan's paper as an example of writing up results – and contextualizing findings in relation to platform recommendations