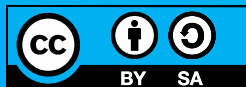


# Grounded Theory

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# Learning Goals

- Understanding the purpose of grounded theory
- Understanding when and how grounded theory can be conducted
- Learn how theories can be developed

# What is Grounded Theory?

- Not a „theory“ but a methodology ( $\neq$  method)  $\rightarrow$  a systematic, theoretical analysis of qualitative (and sometimes even quantitative) data
- Mostly used in the field of data analysis using qualitative feedback
- Grounded theory is the process of deriving a conceptual abstraction by assigning general concepts (codes) to singular incidences in the data
- The goal of grounded theory is to systematically derive a clear and testable hypothesis or well-grounded theory

# Data Sampling

- Kinds of data
  - Interview protocols, videos, audio, images, social media posts, observation, posts, articles, research papers,...
- Case selections are based on
  - Phenomenons
  - Artifacts in the data
  - Events
  - Data patterns
- Important: the sampling does not depend on how often or how rarely cases in the data occur!

# Analysis Process

- Grounded theory analysis involves the following basic steps:
  1. Coding text and theorizing
  2. Memoing and theorizing
  3. Integrating, refining and writing up theories
- Strauss and Corbin differentiate between three kinds of systematic coding procedures [1]



[1] Strauss, A., & Corbin, J. M. (1997). Grounded theory in practice. Sage.

# Open Coding

- Segment data into meaningful expressions and describe them in a concept or theme
- Existing annotations and concepts are attached to these expressions or create new relations (open coding)
- Break down and understand the concept and develop categories using open (W) questions
  - What? - Identify the underlying issue and the phenomenon
  - Who? - Identify the actors involved and the roles they play
  - How? - Identifying the aspects of phenomenon
  - When? How long? Where? - Time, course, location
  - How much? How long? - The intensity or duration
  - Why? - Identifying the reasons causing the phenomenon



Affinity Diagram, Image by florism/flickr <https://www.flickr.com/photos/florism/2410510871> (CC BY-NC-SA 2.0)

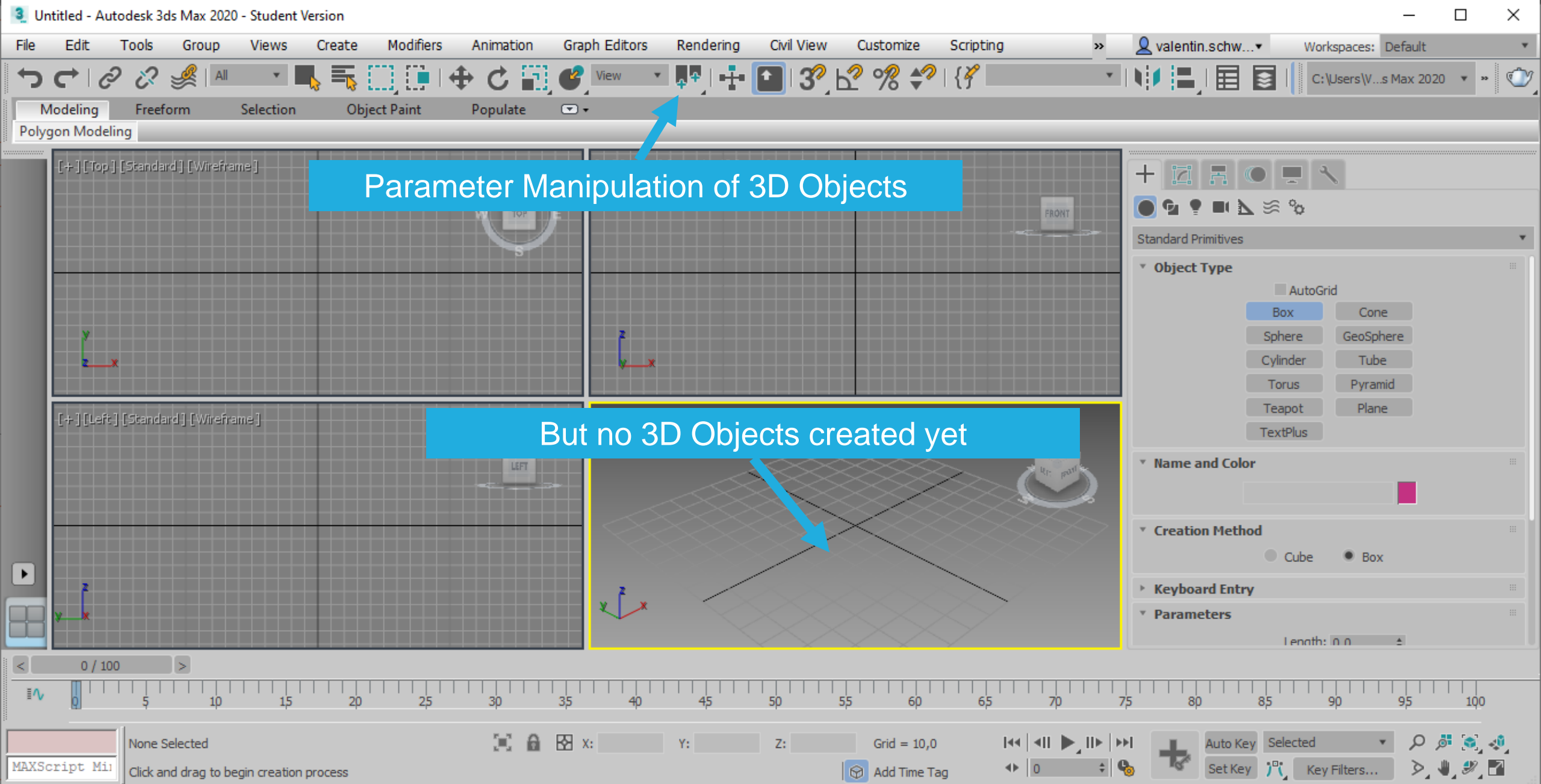
# Axial Coding

- Focusing the phenomenon(s) under study
- Conditions related to that phenomenon
  - Context conditions
  - Structural conditions
  - Causes
- Actions and interactional strategies directed at managing or handling the phenomenon
- Consequences of the actions/interactions related to the phenomenon



# Selective Coding

- Integrate the different categories that have been developed during axial coding into one cohesive theory or framework
- Results from axial coding are further elaborated, integrated, and validated on an abstract level
  - “Is there an overarching theory”?
  - “What is the overarching theory”?
  - Choosing the core category and relating it with the other categories from axial coding
- If the core category is found, the story line of the research is set and the researcher knows the central phenomenon of the research and can finally answer the research question



Parameter Manipulation of 3D Objects

But no 3D Objects created yet

# Example

## Open Coding

Qualitative Feedback:  
„The users click on the button before it has no functionality“

Open Question: When?

„Before button has functionality in this or that context“

Code: No Context Functionality

## Axial Coding

Code: No Context Functionality (NCF)  
Code: UI Element Visibility (CA)

If NCF & CA → Action:

“The button should only be enabled if its functionality has effects.” (SLN #1)

## Selective Coding

Generalization: For all actions if UIEV & CA:

“Unused UI element should only be enabled when they have functionality for the user in the current context.”

Underlying Theory: “Minimalistic UIs increase usability”

# Trustworthiness

- Evaluators can have different interpretations of the data
- Ways of establishing trustworthiness:
  - member check
  - interviewer corroboration
  - prolonged engagement
  - peer debriefing
  - negative case analysis
  - ...
- Concepts on which the researchers do not agree with each other can be resolved through discussion or left open

# Outcome

- Clear, testable hypotheses:

*„Compared to the smartphone application, the voice interface improves the user experience, but increases the frustration level when errors occur.”*

*“Women perceive higher levels of immersion than men with decreasing levels of avatar realism in virtual reality.”*

*“Our machine-learning based model outperforms linear prediction in terms of precision and accuracy.”*

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