

# Qualitative Analysis



**DATA ANALYSIS**

# Contents



- Qualitative Analytical Process
- Trustworthiness in Qualitative Research
- Preparing for Data Analysis
- Approaches to Qualitative Data Analysis



# Qualitative Analytical Process

# What is qualitative data analysis?



- Different approaches to analysing qualitative data

# Things to consider before you start...



- ❑ Make field notes throughout the entire data collection and analysis process. Reflecting on the process of analysis during your fieldwork is key.
- ❑ Be aware of researcher effects: for example, if you are analysing interview data; did you put words in participant's mouth? 'Did that make you feel guilty?' – Avoid this!
- ❑ Important to consider your research design before you collect research as this will make the analysing part easier (we will come back to this later!)
- ❑ Keep memos: they are useful to bridge the gap between the start of the project and the end of the data analysis. You can find something completely different at the end but memos allow you to keep evaluating what you are doing and what you would do different if you were to run research again?

# The steps in designing a qualitative study



1. Establish the general problem/aim to be addressed
2. Establishing a conceptual/theoretical framework for the study
3. Posing general and specific research questions
4. Deciding who will participate in the study (sampling methods)
5. Deciding on an appropriate qualitative research design

# The steps in designing a qualitative study



6. Consider issues of quality: e.g., trustworthiness
7. Decide on data collection methods and establish data collection protocols
8. Manage, analyze and interpret data
9. Write up findings

# Data Analysis After Data Collection



- Iterative process focused on
  - Becoming familiar with the data and identifying potential themes
  - Examining the data in-depth to provide detailed descriptions of the setting, participants and activities
  - Coding and categorizing data into themes
  - Interpreting and synthesizing data into general written conclusions



# Analyzing Qualitative Data



- 1. Read through your data and identify themes.
- 2. Identify important sub-themes.
- 3. Ensure consistency in the themes.
- 4. Confirm depth of themes.
- 5. Assign codes.

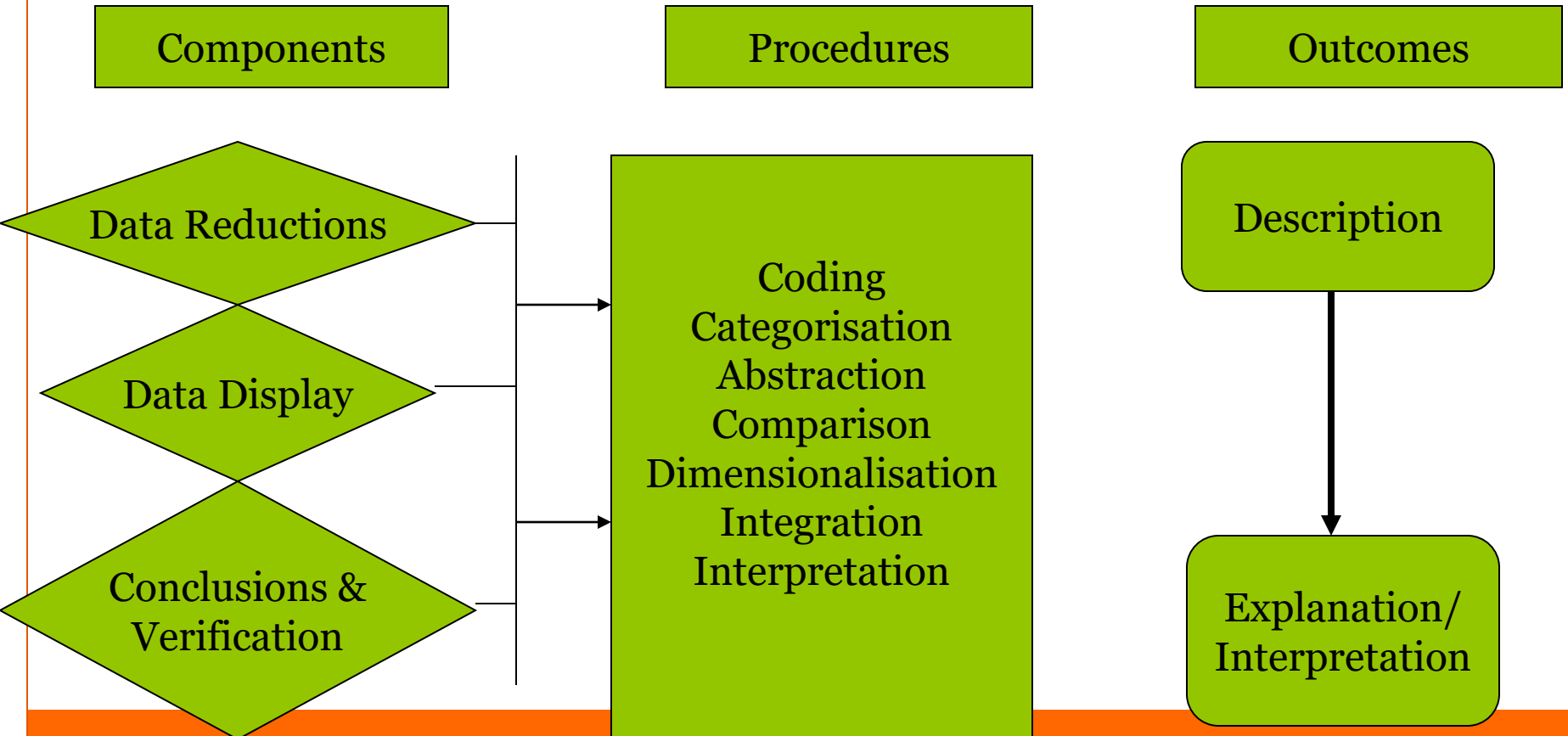
# 1. Analysis Considerations



- 1 Words
- 2 Context (tone and inflection)
- 3 Internal consistency (opinion shifts during groups)
- 4 Frequency and intensity of comments (counting, content analysis)
- 5 Specificity
- 6 Trends/themes
- 7 Iteration (data collection and analysis is an iterative process moving back and forth)

# The Qualitative Analytical Process

(Adapted from descriptions of Strauss and Corbin, 1990, Spiggle 1994, Miles and Huberman, 1994)



# Analysing qualitative data (2)

## Distinctions between quantitative and qualitative data

### Quantitative data

- Based on meanings derived from numbers
- Collection results in numerical and standardised data
- Analysis conducted through the use of diagrams and statistics

### Qualitative data

- Based on meanings expressed through words
- Collection results in non-standardised data requiring classification into categories
- Analysis conducted through the use of conceptualisation

Saunders *et al.* (2009)

# Quantitative vs. Qualitative

**TABLE 18.1** *Quantitative Versus Qualitative Research*

## **Quantitative Methodologies**

Preference for precise hypotheses stated at the outset.  
Preference for precise definitions stated at the outset.  
Data reduced to numerical scores.  
Much attention to assessing and improving reliability of scores obtained from instruments.  
Assessment of validity through a variety of procedures with reliance on statistical indices.  
Preference for random techniques for obtaining meaningful samples.  
Preference for precisely describing procedures.  
Preference for design or statistical control of extraneous variables.  
Preference for specific design control for procedural bias.  
Preference for statistical summary of results.  
Preference for breaking down complex phenomena into specific parts for analysis.  
Willingness to manipulate aspects, situations, or conditions in studying complex phenomena.

## **Qualitative Methodologies**

Preference for hypotheses that emerge as study develops.  
Preference for definitions in context or as study progresses.  
Preference for narrative description.  
Preference for assuming that reliability of inferences is adequate.  
Assessment of validity through cross-checking sources of information (triangulation).  
Preference for expert informant (purposive) samples.  
  
Preference for narrative/literary descriptions of procedures.  
Preference for logical analysis in controlling or accounting for extraneous variables.  
Primary reliance on researcher to deal with procedural bias.  
Preference for narrative summary of results.  
Preference for holistic description of complex phenomena.  
  
Unwillingness to tamper with naturally occurring phenomena.

# EFFECTS OF PARTICIPANT EXPECTATIONS AND RESEARCHER BIAS

- Participant expectations – the participants' ideas of the researcher and the research which can affect the trustworthiness of the data
- Pleasing the experiment (or the screw you effect)
- Researcher bias – the researcher does not pay enough attention to the participants
- This leads to the result that it is the researcher's own beliefs that determine the research effect
- Can be checked through interviews, credibility checks and reflexivity



# Trustworthiness in Qualitative Research

A study is trustworthy if, and only if, the reader of the research report judge it to be so” (Rolfe, 2006)



# Data Analysis



- Voluminous
- Computer programs
- Trustworthiness (Reflect on data –What is data telling you?)
  - TRIANGULATION of data sources
    - ✦ Use of multiple data collection techniques = data collected in 1 way can be cross checked for accuracy with another
    - ✦ Prevents researcher from accepting readily the validity of initial impressions
    - ✦ Assists in correcting biases that occur when the researcher is the only observer

# Data Analysis



- Trustworthiness (continued)
  - Observations, interviews, documents, etc.
  - Researcher bias – continual alertness
  - Peer debriefer
    - ✦ someone who reads your field notes, transcriptions, interpretations
  - Member Checks
    - ✦ data sources provided to participants for their review, comments, expansion of thoughts

# Criteria for judging the quality and credibility of qualitative research



- General criteria :
  - Data collection and analysis methods well justified and suited to research question/s posed
  - Alternative possibilities are considered, such as:
    - ✦ Plausible alternative themes or explanations are discussed
    - ✦ Negative cases are analysed in depth to establish the basis for their aberrant status

# Evaluating the Quality of Data



- Data quality
  - Six questions
    - ✦ Are the data based on one's own observations, or is it hearsay?
    - ✦ Is there corroboration by others of one's observation?
    - ✦ In what circumstances was an observation made or reported?
    - ✦ How reliable are those providing the data?
    - ✦ What motivations might have influenced a participant's report?
    - ✦ What biases might have influenced how an observation was made or reported?

# Scientific Adequacy



- RIGOR in qualitative research is less about the adherence to rules and more about fidelity to the spirit and standards of qualitative work (Sandelowski, 1993)

# Data Analysis

- Researcher immerses self in data to bring order & meaning to vast narrative
- Begins with 1st data collection episode
- Reading, rereading, intuiting, analyzing, synthesizing & reporting on data
- Cyclical & recursive process that requires an extensive amount of time

# Data Analysis (cont'd)



- Data from interviews are continuously reviewed to identify additional questions
- Data from earlier interviews are routinely returned to participants for clarification/elaboration
- Investigator must look for meaning in the data as it is reviewed

# Data Analysis (Cont'd)



- At conclusion of study a protracted period of data immersion in which conclusions are reviewed in the context of the whole study
- Data similar in meaning are clustered together into preliminary categories



# Criteria of Trustworthiness



- **Credibility**
- **Transferability**
- **Dependability**
- **Confirmability**

# Credibility

- Refers to the accuracy of the description
- Is the description plausible & recognized by those who experienced it.
- Enhanced by prolonged time in the field
- Repeatedly observing & interacting with participants
- Triangulation of data sources, methods, data type, investigators, & theories
- Member checks-participants involved with data analysis

# Evaluating the Quality of Data



- **Credibility**

- ✦ The extent to which the concepts used to describe the study are congruent with the data selected to gather information about the concepts
- ✦ Strategies
  - Prolonged engagement
  - Peer examination of meanings
  - Triangulation – cross validation that seeks regularities in the data by comparing different participants, settings, and methods to identify recurring results

# Dependability

- Refers to the stability & trackability of the changes in data over time & conditions
- Reflects the reality that people's situations change & reality differs for people
- Want to determine the extent to which another researcher with similar training & rapport with participants would make the same observations
- This is determined by an **audit trail**

# Transferability

- Concerned with generalizability or fittingness of findings to other settings, populations, & contexts
- Report must provide sufficient detail so that readers can assess this
- Lack of transferability is often viewed as a weakness of qualitative methods

# Evaluating the Quality of Data

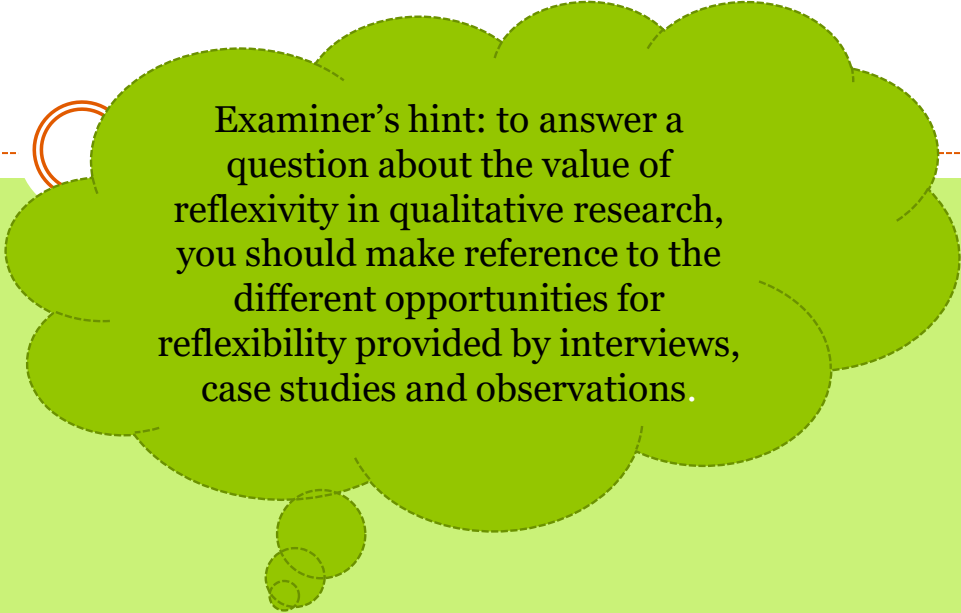


- Transferability – generalizing the results to other contexts
- Including in the report a methods section that describes in-depth the processes and methods used by the researcher

# Confirmability

- Basic issue here is one of neutrality
- Do conclusions depend upon the subjects & conditions of inquiry rather than on the researcher
- Would 2 independent researchers agree about the meanings emerging from the data
- An **audit trail** is used
- researcher must explicate how personal biases may have come into play and consider alternative explanations

# Reflexivity



Examiner's hint: to answer a question about the value of reflexivity in qualitative research, you should make reference to the different opportunities for reflexivity provided by interviews, case studies and observations.

Refers to the researcher's need to constantly be aware of how and why they are conducting the research, and to recognize at what points their own beliefs and opinions might have influenced data collection or analysis.

To undergo an interview with colleagues is a way to expose possible bias.



# Evaluation: strengths



- Provide rich data – that is, in-depth descriptions of individual experiences.
- Particularly useful for investigating complex and sensitive issues.
- Explain phenomena – that is, go beyond mere observation to understand what lies behind them (eg. why do people become homeless?)
- Generate new ideas and theories to explain and overcome problems.
- People are studied in their own environment, which increases credibility.

# Evaluation: limitations



- Can be very time-consuming and generate a huge amount of data.
- Data analysis can be difficult because of the amount of data and no clear strategy for analysis.
- Interpretation of data may be subjective (but reflexivity can help to minimize this)

# Is it possible to generalize from qualitative data?



This is often the aim of research, but not always so for qualitative research.

- **Representative generalization** – can the findings be applied to populations outside the population of the study? Samples are often small and not selected for being statistically representative so this makes generalization difficult. However, if evidence from other studies confirms the findings (confirmability through eg. triangulation) it is argued that generalization is possible (Hammersley, 1992)
- **Inferential generalizability** – same thing but with the difference that it is the setting of the research that is to be generalized to other settings. Transferability. Depends on the depth of the description of the context – and this may allow for inferences to be made – but needs to be supported or disproved by further evidence (e.g. transferability check through triangulation)
- **Theoretical generalizability** – if the theoretical concepts can be used to open up new fields and develop further theory

# Criteria for judging quantitative and qualitative research



## Credibility

"Trustworthiness" How believable are the research conclusions?  
Breadth and depth is gathered.

measures well controlled.

## Transferability

The context is well described as it is unlikely that  
it won't have an impact on the findings.

## Dependability

Data obtained cannot be expected to be the same  
Dependability means therefore that the researcher has  
Described all factors that might have influenced the data.

## Confirmability

Subjectivity is not only unavoidable; it is valued. Therefore  
researchers should give details of procedures and attempt

To find examples that contradict the findings.

## Internal validity

Conclusions and interpretations are  
correct as variables are well defined and

## Generalizability

The research conclusions can be applied to  
Different samples as the research context is  
controlled enough.

## Reliability

Repeated use of the instrument provide stable  
measurements and researchers using them  
Find similar results

## Objectivity

As many sources of bias from opinion are

Eliminated from the research process.

# Triangulation

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- Is the application and combination of several research methodologies in the study of the same phenomenon-data sources, sample groups or investigators
- Area under investigation is looked at from different perspectives
- By combining multiple observers, theories and methods, researchers can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer, single-theory studies



- **Triangulation (crystalisation) –divergent sources of information**
  - Methods (interviews, observations, document analysis)
  - Sources (different teachers, or teachers with other school staff)
  - Theoretical frameworks (different assumptions to identify any inconsistencies in developed theories)
- **Member check– ask participants to confirm transcripts/analyses**

# Interpretation of Data, con't.



- 3. Triangulation—compare 2 or more forms of evidence
  - a. If point to same or similar conclusion, validation is enhanced
  - b. Bolsters confidence in findings but some see it as naïve
  - c. More useful for descriptive validity
  - d. Several ways to obtain
    - ✦ 1) Multiple sources
    - ✦ 2) Multiple methods
    - ✦ 3) Multiple researchers

# Something on triangulation



As a way to increase credibility, but also check transferability, dependability and confirmability triangulation is often used.

Triangulation = a cross-checking of information and conclusions in research, brought about by the use of multiple procedures or sources. If there is agreement between these, there is support of the interpretation of data.

Using triangulation does not mean you get a certain truth, but you get closer to it – reflexivity is still necessary.



# Example of triangulation techniques:



- Other triangulation Method triangulation. Comparing data that come from the use of different methods. These could be both quantitative and qualitative. Eg. first using a questionnaire to ask about eating habits in a school, and then conduct focus group interviews afterwards.
  - Researcher triangulation – involves using different people as researchers. This increased the confirmability and credibility of conclusions. Without this data collection and conclusions might be affected by researcher bias.
- ”N” techniques include data triangulation and theory triangulation.

# Theoretical Saturation



This is where you reach a point where no new information is coming out of the data. Be realistic about how much time and resource you have and stop analysis at a sensible point.



# Preparing for Data Analysis

# Preparing data for analysis



## Key issues

- Transcribing qualitative data
- Using electronic textual data including scanned documents
- The interactive nature of the process

# Classifying and Interpreting Data



- Three analytic strategies
  - ✦ Negative case
  - ✦ Analytic induction
  - ✦ Constant comparison

# Classifying and Interpreting Data



- Negative case – the process of examining data that contradicts an emerging category
  - ✦ Provides a different perspective
  - ✦ Provides an important check to balance the tendency to stay with first impressions
  
- Analytic induction – the process of examining data to develop or test a theory
  - ✦ Four stages
    - Start with a preliminary focus or explanation of a phenomena
    - Develop a hypothesis that explains data
    - Collect data to test the hypothesis
    - Accept or reformulate the hypothesis
  - ✦ Data are continuously gathered until no contradictory data is found

# Classifying and Interpreting Data



- Constant comparison
  - ✦ Constantly comparing identified ideas and concepts to determine their distinctive characteristics so they can be placed in different appropriate categories
  - ✦ Iterative in nature
  - ✦ Ongoing throughout the entire research process

# Other Strategies:

## Method of Constant Comparison



- Look for indicators of categories in events and behavior - name them and code them on document(s)
- Compare codes to find consistencies and differences
- Consistencies between codes (similar meanings or pointing to a basic idea) reveals categories. So need to categorize specific events
- Create memos on the comparisons and emerging categories
- Eventually category saturates when no new codes related to it are formed
- Certain categories become more central focus - axial categories and perhaps even core category



# Other Analytic Strategies



- Narrative approach: detailed narrative of field experience
- Ideal types: (Weber) compare ideal forms (i.e. suggested by theory) to empirical observations
- Successive Approximation: move back and forth between theory and data until theory (or generalization) is perfected
- Illustrative Method: find empirical examples in the data to support the theory



# Approaches to Qualitative Data Analysis

# I. DATA ANALYSIS OVERVIEW



- A. Challenges of dealing with data
  - 1. Must process, understand & turn data into a useful contribution
  - 2. Findings usually can be given multiple plausible interpretations
  - 3. Often must take a meandering, uneven path to completion with unexpected discoveries (serendipity)
  - 4. Must resonate with both the local scene & academic field
  - 5. Must acquire analytical & interpretive skills

# Overview, con't.



- B. Framework for making sense of data
  - 1. Data analysis
    - ✦ a. Process of labeling & breaking down (decontextualizing) raw data
    - ✦ b. Reconstituting into categories, patterns, themes, concepts & propositions
    - ✦ c. Both inductive & deductive
  - 2. Data interpretation
    - ✦ a. Determining what it all means
    - ✦ b. An *abductive* process—creating a new principle or theory from established facts

# Data Analysis Comparison

## Qualitative Research

- Theory development
- Exploratory purpose
- Description of participants
- Comparison of participants
- Create in-depth descriptions and understandings of characteristics

## Quantitative Research

- Hypothesis and theory testing
- Description of population
- Comparison of categories within the population
- Create in-depth descriptions and understanding of relationship among variables

# Data Analysis Comparison

## Qualitative Research

- Elucidate findings of quantitative research
- Verify the presence of phenomena
- Purpose to research is to understand a problem

## Quantitative Research

- Verify findings of qualitative research
- Identify the causes of phenomena
- Purpose of research is to explain and predict the existence of a problem

# Data Analysis Comparison

## Qualitative Research

- Understand from the point of view of the participants
- Interpret experiences and meanings
- Discover theme and relationships
- Provide words for closed questions

## Quantitative Research

- Understand relationships among variables

# Data Analysis Comparison

## Qualitative Research

- Discovery and identification of new thought and understandings
- Purpose to discover ideas
- Exploratory research

## Quantitative Research

- Verification of theory, predictions
- Purpose to test hypotheses
- Conclusive research



# Data Analysis Comparison

## Qualitative Research

- Program aims at individual outcomes
- Theory developed during study
- Data precede theory
- Complex patterns of interactions among variables not investigated

## Quantitative Research

- Program aims at common outcomes
- Theory developed a priori
- Theory precedes data
- Complex patterns of interactions among variables may be investigated

# Data Analysis Comparison

## Qualitative Research

- Limited statistical analysis
- Inferential statistics are generally irrelevant
- Lack of ability to control for extraneous variables
- Results cannot be generalized

## Quantitative Research

- Basic to advanced multivariate statistical analyses
- Inferential statistics are generally essential
- Results are generalizable based on inferential statistical analyses

# Data Analysis Comparison

## Qualitative Research

- Lack of ability to control for extraneous variables
- Data processing and analysis time consuming
- Varied analyses
- Focus on themes and meanings

## Quantitative Research

- Potential to control for extraneous variables
- Data processing and analysis not as time consuming
- Standardized analyses
- Focus on trends, comparisons, predictions, explanations

# Data Analysis Comparison

## Qualitative Research

- Inductive analyses
- “Thick descriptions”
- Validity based on honesty, richness, authenticity, depth, scope, subjectivity, strength of feeling, catching uniqueness, idiographic statements

## Quantitative Research

- Deductive analyses
- Control of extraneous variables
- Validity based on objectivity, generalizability, replicability, predictability, controllability, and nomothetic statements

# Data Analysis Comparison

## Qualitative Research

- No testing of null hypotheses
- No confidence intervals
- Meaning rather than numeric descriptions sought

## Quantitative Research

- Null hypothesis testing
- Confidence intervals
- Numeric descriptions sought

# Qualitative Methods



- **Grounded Theory Study**
  - Discover or invent theory grounded in real-world experiences
    - ✦ Middle-range theories: situation related
- **Life histories**
  - Story of a single individual or groups of single individuals
    - ✦ Recall significant events of ones life
    - ✦ Significant understanding of the historical context

# Qualitative Methods



- **Case Study**
  - Exploration of a bounded system (e.g., school)
  - In-depth data collection involving multiple sources of information
- **Phenomenology study**
  - Describes the meaning of a lived experience for several individuals about a phenomenon
  - Explores the structures of human consciousness

# Qualitative methods



- **Ethnography study**
  - Interpretation of a culture of social group
  - Natural setting
  
- **Basic/Generic**
  - Studies that illustrate characteristics of qualitative research



# Types of qualitative analysis process (1)



## Main types

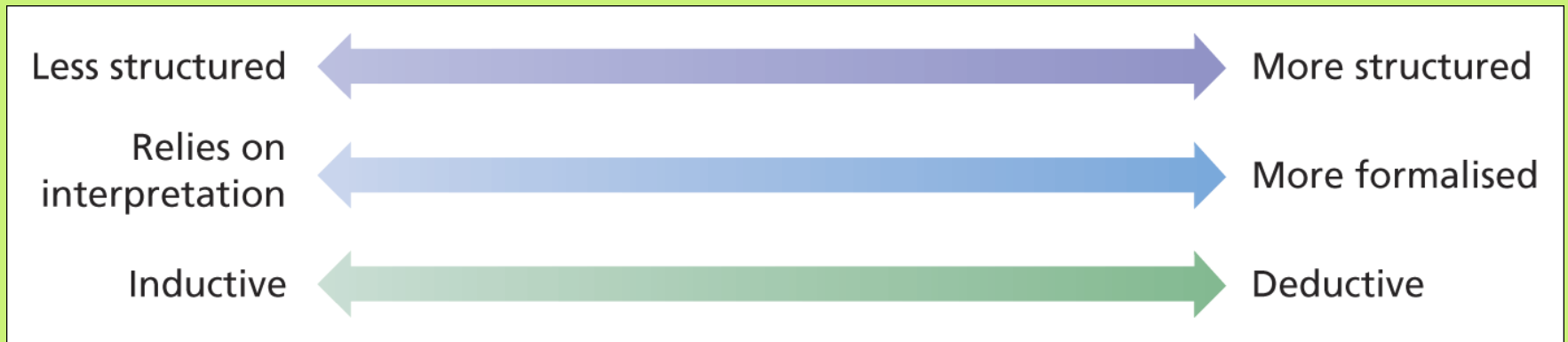
- Summarising (condensation) of meanings
- Categorising (grouping) of meanings
- Structuring (ordering of meanings using narratives)

Saunders *et al.* (2009)

# Types of qualitative analysis process (2)



## Dimensions of qualitative analysis



Saunders *et al.* (2009)

Figure 13.1 Dimensions of qualitative analysis

# Categorising data

## Points to consider

- Deriving categories
- 'Unitising' data
- Recognising relationships and developing categories
- Developing testable propositions
- Qualifying your qualitative data

# Five Guidelines for Category Systems



Guideline 1: The categories must reflect the purpose of the research

- Matter of validity of category

Guideline 2: The categories must be exhaustive

- Ex) Media categories

1. Newspaper
2. Weekly newspaper
3. Radio news
4. Television news

Guideline 3: All categories must be mutually exclusive

Guideline 3: Placement of instances in one category must be independent of the other categories

Guideline 4: All categories in your system must reflect one classification system

# Stages in qualitative data analysis



- Qualitative data analysis is an iterative process, involving several rounds of reflecting, analysing, theorising, and verifying
- **During** data collection
  - Reading – data immersion – reading and re-reading
  - Coding – listen to the data for emerging themes and begin to attach labels or codes to the texts that represent the themes

# Stages in qualitative data analysis



- **After** data collection
  - Displaying – the themes (all information)
  - Developing hunches, questioning and checking
  - Reducing – from the displayed data identify the main points

# Stages in qualitative data analysis



- **Interpretation (2 levels)**
  - At all stages – searching for core meanings of thoughts, feelings, and behaviours described
  - Overall interpretation
    - ✦ Identify how themes relate to each other
    - ✦ Explain how study questions are answered
    - ✦ Explain what the findings mean beyond the context of your study
- **Representation of data**
  - Themes, illustrated by data
  - Tables, schemes, models, diagrams, frameworks
  - Narratives

# Processes in qualitative data analysis



## 1. Reading / Data immersion

- Read for content
  - ✦ Identify emergent themes and pose tentative explanations
- Read identifying patterns
  - After identifying themes, examine how these are patterned

## 2. Coding

- Building theme related files



# Processes in qualitative data analysis



## 3. Displaying data

- Capture the variation or richness of each theme
- Take note of any differences between individuals and sub-groups
- Return to the data and examine evidence that supports each sub-theme

## 4. Developing hunches, questioning and checking

- Extract meaning from the data
- Do the categories developed make sense?
- What pieces of information are missing or underdeveloped?
- What other opinions should be taken into account?
- How do my own biases influence the data collection and analysis process?

# Processes in qualitative data analysis



## 5. Data representation

- Make visible the most essential concepts and relationships and provide overall sense of the data
- Distinguish main and sub- themes
- Separate essential from non-essential data
- Use visual devices – e.g. matrices, diagrams

## 6. Interpretation

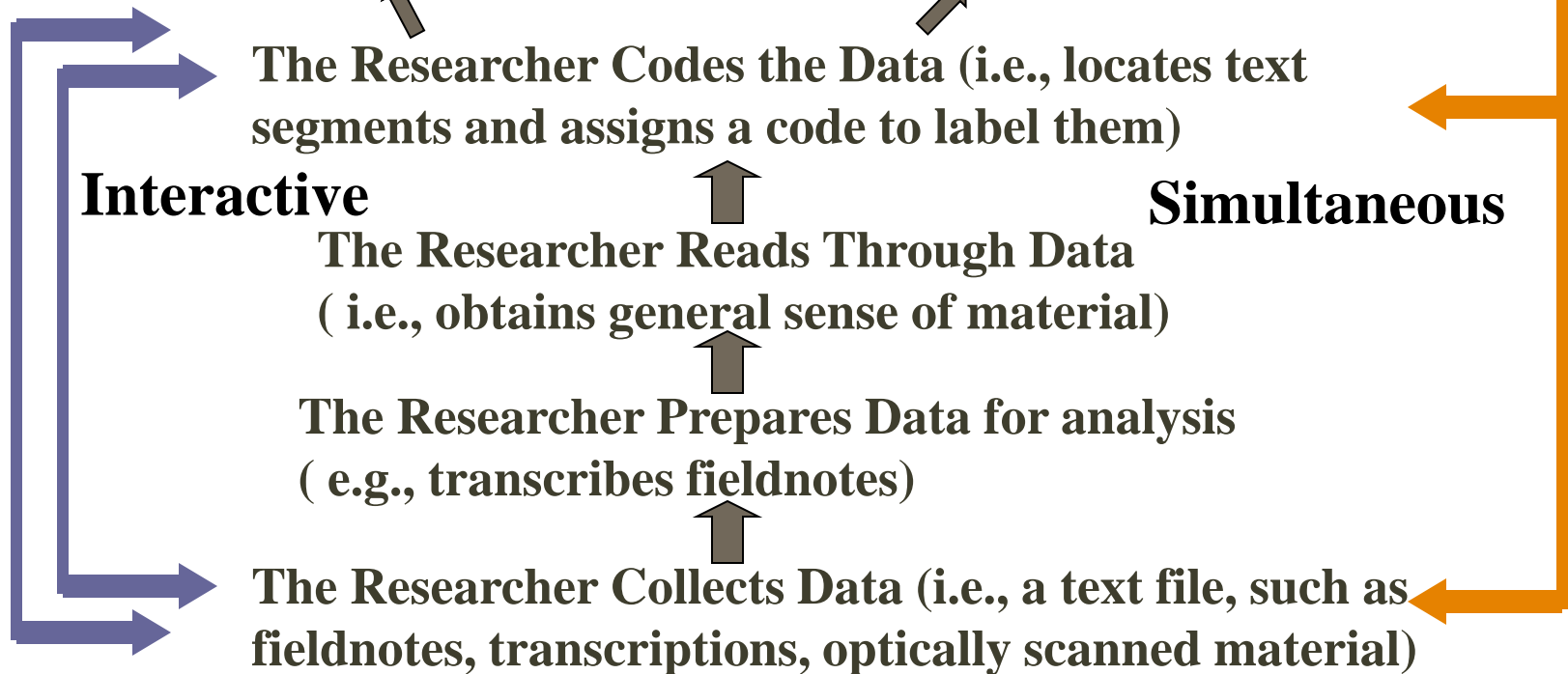
- Identify core meaning of the data
- Attributed meanings should be credible:
  - ✦ Consistent with data collected
  - ✦ Verified with respondents
  - ✦ Present multiple perspectives (convergent and divergent views)

# What is the Process of Data Analysis?



**Codes the Text for  
Description to be Used  
in the Research Report**

**Codes the Text for  
Themes to be Used  
in the Research Report**



# Analysis of Qualitative Data



- 1) Data reduction – Select which aspects of the data are to be emphasized, minimized, or set aside for the project at hand.
- 2) Data display – Develop a visual interpretation of the data with the use of such tools as a diagram, chart, or matrix. The display helps to illuminate patterns and interrelationships in the data.
- 3) Conclusion drawing and verification – Considers the meaning of analyzed data and assess its implications for the research question at hand.

# Approaches to qualitative analysis



## **Main approaches**

- The deductive approach
- The inductive approach

# Analytic induction

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- Analytic induction is a way to develop causal explanations of a phenomenon from one or more cases
- First, define a phenomenon that requires explanation and propose an explanation
- Next, examine a case to see if the explanation fits. If it does, then examine another case. An explanation is accepted until a new case falsifies it
- When a case is found that doesn't fit, change the explanation (so that you can include the new case) or redefine the phenomenon (so that you can exclude the nuisance case)
- Ideally the process continues until a universal explanation for all known cases of a phenomenon is attained (Ryan & Bernard, 2000: 787)

## Other (cont.): Analytic Induction

- Look at event and develop a hypothetical statement of what happened.
- Look at another similar event and see if it fits the hypothesis. If it doesn't, revise hypothesis.
- Look for exceptions to hypothesis, when find it, revise hypothesis to fit all examples encountered.
- Eventually will develop a hypotheses that accounts for all observed cases.

## Other (cont.): Analytic Induction

- Look at event and develop a hypothetical statement of what happened.
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- Look for exceptions to hypothesis, when find it, revise hypothesis to fit all examples encountered.
- Eventually will develop a hypotheses that accounts for all observed cases.

# Analytical aids



## Types of analytical aids

- Interim summaries
- Self-memos
- Researcher's diary

# What forms do qualitative data take?



Types of data are

- field notes
- audio (and sometimes video) recordings
- transcripts

# Deductively based analytical procedures



## **Procedures applicable to qualitative analysis**

- Pattern matching
- Explanation building

# Qualitative Data Analysis



- Searches for explanatory patterns.
- Links data collection, analysis and theory.

# Six Ways to Discover Patterns



- Frequencies
- Magnitudes
- Structures
- Processes
- Causes
- Consequences

# Inductively based analytical procedures



## **Procedures applicable to qualitative analysis**

- Data display and analysis
- Template analysis
- Analytic induction
- Grounded theory – open, axial and selected coding
- Discourse analysis
- Narrative analysis

# Various approaches to Analysis and Interpretation

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- Narrative analysis
- Semiotics
- Content analysis
- Conversation analysis
- Discourse analysis
- Grounded theory
- Hermeneutics
- Phenomenology
- Literary criticism
- Deconstruction

Coding  
Series of events  
Critical incidents  
Decision-modelling  
Cognitive maps  
Analytic induction

**Within case analysis**  
**Cross case analysis**  
**Pattern matching**  
**Explanation building**  
**Time series analysis**



# Narrative analysis



- Narrative is defined by the *Concise Oxford English Dictionary* as a ‘a spoken or written account of connected events; a story’ (Soanes & Stevenson, 2004)
- Traditionally, a narrative requires a plot, as well as some coherence. It has a linear structure, with a beginning, middle, and end
- Narrative analysis is a qualitative approach to the interpretation and analysis of qualitative data
- There are many different kinds of narrative analysis

# Narrative writing



- Narratives or narrative accounts are one method of representing qualitative data
- Benefits:
  - provide context (opposite of de-contextualisation)
  - show interrelationships (opposite of fragmentation)
  - illustrate complexity (opposite of reductionism)
  - give ‘voice’ to participants (rather than the ‘impersonal’ and ‘neutral’ researcher)
  - serve as metaphors
  - stay in the memory

# Analytic Strategies



- Narrative approach: detailed narrative of field experience
- Ideal types: (Weber) compare ideal forms (i.e. suggested by theory) to empirical observations
- Successive Approximation: move back and forth between theory and data until theory (or generalization) is perfected
- Illustrative Method: find empirical examples in the data to support the theory

# Semiotics



- The "science of designs".
- Signs are anything that is assigned a special meaning.

# Semiotics



- Semiotics is primarily concerned with the analysis of signs and symbols and their meaning
- A sign or symbol is something that can stand for something else
- In business and management, the greatest use of semiotics has been in marketing, consumer research and information systems. This is because of the pervasiveness of signs in marketing communications (e.g. brand names, logos, and advertising) and the importance of 'information' in information systems

## Other Strategies:

### Method of Constant Comparison

- Look for indicators of categories in events and behavior - name them and code them on document(s)
- Compare codes to find consistencies and differences
- Consistencies between codes (similar meanings or pointing to a basic idea) reveals categories. So need to categorize specific events
- Create memos on the comparisons and emerging categories
- Eventually category saturates when no new codes related to it are formed
- Certain categories become more central focus - axial categories and perhaps even core category.

# Conversation analysis



- Conversation analysis looks at the use of language by people as a type of action, or as a skilled accomplishment by competent actors
- A key concept within conversation analysis is the idea of the *speaking turn*. The principle of turn-taking in speech is claimed to be a universal feature of all conversations
- It does not presume the existence of fixed meanings in words and idioms
- Meanings are shaped in the context of the exchange

# Conversation Analysis



## **Fundamental Assumptions:**

- Conversation is a socially structured activity.
- Conversations must be understood contextually.
- Structure and meaning of conversations must be transcribed.

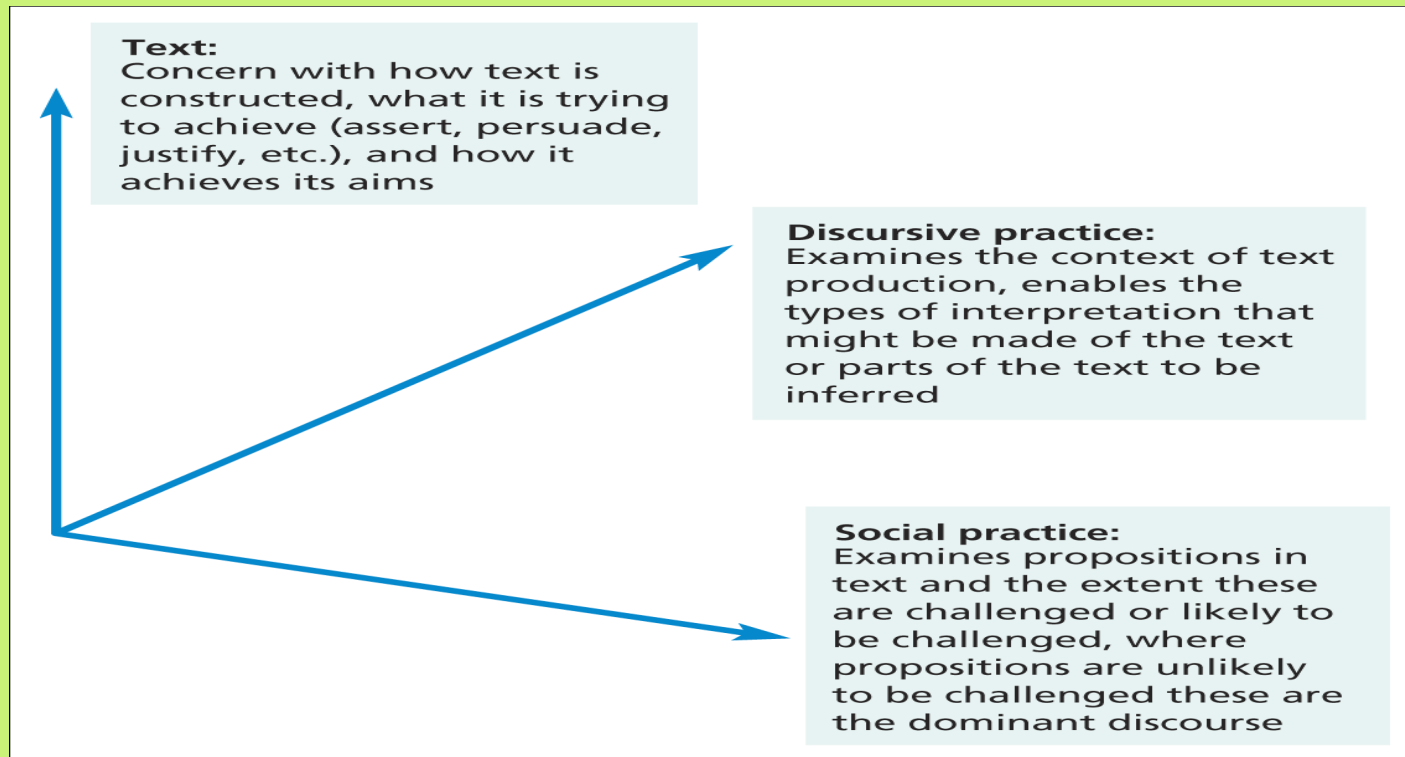


# Discourse analysis

- Discourse analysis looks at the way texts are constructed and is concerned with the social contexts within which the text is embedded
- The word *discourse* refers to communication that goes back and forth, like an argument or debate. All languages can be treated as a social interaction (there is always a speaker/writer and listener/ reader), but discourse analysis focuses mostly on language in use - the use of naturally occurring language in speech and/or written text
- Discourse analysis is concerned with actual instances of language as used in communication
- Encourages multiple readings and interpretations of a text
- Many researchers focus on 'language games'

# Discourse analysis

## A three-dimensional analytical framework for critical discourse analysis



Saunders *et al.* (2009)

Figure 13.2 A three-dimensional analytical framework for critical discourse analysis

# Different analysis methods



- You can apply different analytic methods to a data set depending on how the data has been collected.
- **Framework analysis**
- You have a pre-existing research question(s) and you are looking to prove this through analysing the data set.
- VS
- **Grounded theory**
- Analyse the data set looking for themes derived from the content and make a decision as to whether 1 theme is worth exploring more than other. Grounded theory is the basis of thematic analysis and state that the theory emerges out of the data.

# Principles of Grounded theory



‘Naming, defining and understanding what people say’

- ❑ Theory emerges out of the data rather than being developed in advance
- ❑ Begin with as few pre-determined ideas as possible
- ❑ Coding is shaped by the researchers interpretation of the data
- ❑ Characterised by different types and levels of code
- ❑ Categories of data are created and refined through constant comparison
- ❑ Analysis and data collection are iterative
- ❑ End point is theoretical saturation

# Grounded Theory Method



## **Four Stages:**

- Comparing incidents applicable to each category.
- Integrating categories and their properties.
- Delimiting the theory.
- Writing the theory.

# Hermeneutics



- Hermeneutics suggests a way of understanding textual data
- Hermeneutics is primarily concerned with the meaning of a text or text-analogue (an example of a text-analogue is an organization, which the researcher comes to understand through text or pictures)
- The basic question in hermeneutics is: what is the meaning of this text? (Radnitzky, 1970: 20)
- If hermeneutic analysis were to be used in business and management, the object of the interpretive effort could become one of attempting to make sense of a company as a text-analogue

# Metaphorical analysis



- A metaphor is the application of a name or descriptive term or phrase to an object or action to which it is not literally applicable (e.g. a window in Windows Vista). Metaphors do not appear in isolation, but are part of larger meaningful structures
- Metaphorical analysis ‘allows a systematic reflection of the metaphors in which, and through which, we perceive, speak, think, and act’ (Schmitt, 2005: 369)

# Ethnography Data Analysis



- Follows a cyclical pattern
- Data collection, recording, analyzing, returning to the field to collect more data
- Proceeds through 4 levels: domain analysis, taxonomic analysis, componential analysis, & theme analysis
- Goal is to discover cultural patterns in the data people are using to make sense out of their experiences



# Ethnographic content analysis



The basic steps include:

- Location of all relevant documents - sample if desirable.
- Identification of the units to be analysed
- Development and testing of a protocol from the intensive analysis of a few documents
- Revision and further refinement of the protocol as analysis proceeds
- Interpretation of meaning within content and culture

# Ethnographic Findings



- A two-step process
- 1. A cultural inventory
- 2. A final descriptive report that may be a book or monograph

# Componetial analysis



- *What attributes does an individual or thing have?*

# Componential Analysis of services for the unemployed

Slide  
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	For young	For older	Training	Advice
Adult Training	-	+	+	-
Youth Training	+	-	+	-
Training Access Points	+	+	-	+
Work Link	+	+	+	+
BCEATA	+	+	+	+
Start-up Business Units	-	+	-	+
Business Access Scheme	-	+	+	-
Workers Co-operatives	-	+	-	+
CEASA	+	+	-	+
Careers Service	+	-	-	+
Redundancy Counseling	-	+	-	+



# Content Analysis

# Defining the Method

- Content analysis is a systematic, objective, and quantitative method for researching messages.
- Main analysis areas
  - Documents
  - Speeches
  - Media releases
  - Video content and scripts
  - Interviews
  - Focus groups
- “Replicable” due to systematic and objective process
  - Based on the rules, others will find the same results.
- Messages are transformed from “qualitative” to “quantitative”
- “Validity” is considered and “Reliability” can be calculated

# Content Analysis



- Analysis of written documents
- Developing categories of words and phrases
- Looks at frequency of words, uses word counts
- Used for historical trends
  - e.g. feminism in women's magazines over the last 10 years
  - e.g. number of centimetres devoted to sport in newspapers
- Can be used to analyse interview texts
  - e.g. counting expressions of conflict

# Content analysis



- ***When to use:*** when you have large sets of existing written or visual documentation for analysis
- ***Type of question best suited:***  
What is the percentage of occurrences of 'X' words, events, types of approaches etc.  
How have particular concepts been used in context and why? and for what purpose?
- ***Strengths:*** enumerative provides a numbers oriented overview, while ethnographic provides thematic analysis with more depth of explanation as to why and how words have been used in particular cultural contexts.
- ***Weaknesses:*** Enumerative data alone provides only a superficial overview and thematic contextual interpretation alone lacks the detailed numerical information to situate and structure the data.



# Content analysis : Process 1.



1. Do you have sufficient **documents** to make this form of analysis useful? which aspects of these documents are to be analyzed? All of the documents? part of the documents? and pertaining to what topics?
2. What **sampling** approach will be undertaken? random, stratified, cluster or non probability approaches?
3. What **level of analysis** will be undertaken and what particular concepts or situations will be coded for?  
How will you incorporate any thematically analysed data:  
as a basis for the generation of codes?  
as a basis for cross checking? to identify discourses?  
or to provide depth information and case studies?

# Content analysis : Process 2



4. How will the protocol and/or your codes be generated?  
via preliminary data and thematic analysis?  
via a predecided (a priori) coding frame derived from the literature and your own experiences of this field?
5. Will you look at context? or stay with a broad numerical overview?
6. How reliable is the approach or protocol that you have decided on?  
Can a high level of inter-coder reliability be sustained?  
Can validity be achieved through cross referencing to other documents  
or through triangulation and the inclusion of qualitative data?

# Enumerative content analysis tools



- *Word frequency* - helps you to identify how often key words are turning up in your documents.

*Key word in context or concordance.* This approach shows each word in the document in alphabetical order and in context.

- *Category frequency or cluster analysis* where other related words (synonyms) will also be picked up,
- *Lemmatization* where the base form of the word and its variations are gathered
- *co-occurrence* of particular words such as 'security' and 'terrorism'



# Content Analysis



- Enables us to look at qualitative data in a quantitative manner

Qualitative data (In-depth Interview, FGI, Observation)

→ Make category (Coding scheme)

→ Quantification

→ Analysis

Ex) Number of certain types of press releases

- Transition from “Informal” to “Formal” methodologies

Informal

Qualitative

Observation

Formal

Quantitative

Count

Samplings

# Advantages vs. Disadvantages



- Advantages
  - Its ability to objectively and reliably describe a message
  - Provides both logical and statistical bases for understanding messages
  - A major methodological tool that bridges informal and formal methods
- Disadvantage
  - It requires that the actual messages be recorded for analysis.
  - Internet content analysis: Transient characteristic of online messages

# Conducting a Content Analysis



## Step 1: Find your topic

- A documentary/historical search of research relevant to your interests.

## Step 2: Identify the text

- Newspaper, Magazine, Books, Television programs, PSA, Transcripts of Interviews, Brochures, Job announcement, Comic strips, Billboards, Internet messages.
- Decide to whether conduct “census” or acquire “representative sample”
- If you are interested in generalizing from the sample to population,
  1. Specify the population of text to which you wish to generalize
  2. Use some procedure for selecting a sample from this population.
  3. Use a random sampling methods.

# Conducting a Content Analysis

## **Step 3: Decide a “unit of analysis”**

- Identify the appropriate message unit to code
- Berelson’s five units
  1. Symbols/words: company name, logotypes, articles of speech
  2. Characters: Race, stereotypical roles, occupations
  3. Themes: Slogans, sexuality, company theme reported
  4. Time/space measured: Column inches of story, airtime during news programming, size of photographs in print
  5. Items: Advertisement, editorial, speech

## **Step 4: Create “coding scheme”**

- The system through which you will categorize the units

## **Step 5: Messages must be coded**

- The actual counting of units and their placement into categories

## **Step 6: Inter-coder reliability must be secured**



# Content analysis: Advantages



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- Can simplify very large documents into enumerative information
- Can analyse interactions from a distance providing a sense of 'objectivity'
- Can identify intentions, attitudes and emotions as well as reveal lines of propoganda, inequality and power
- Can combine both qualitative and enumerative approaches to look at relationships among numbers and relationships between these and the cultural context.

# Content Analysis: Disadvantages

- Can be criticized for being too positivist in orientation particularly when only enumerative approaches are used
- Limited or poor sampling strategies can lead to bias
- Interpretations of words may be limited by the dictionary capacity of the computer program
- Can de-contextualise information; converting texts into categorical variables constructs a limited frame in terms of interpretation
- Can be a-theoretical with minimal interpretation on the assumption that numbers say it all

## 2. The Procedures



- 1 Coding/indexing
- 2 Categorisation
- 3 Abstraction
- 4 Comparison
- 5 Dimensionalisation
- 6 Integration
- 7 Iteration
- 8 Refutation (subjecting inferences to scrutiny)
- 9 Interpretation (grasp of meaning - difficult to describe procedurally)



# Coding for Qualitative Research

# WHAT IS CODING?



- “Coding is analysis” (Miles & Huberman 1994, 56).
- Coding, “involves taking text data or pictures gathered during data collection, segmenting sentences (or paragraphs) or images into categories, and labeling those categories with a term...” (Creswell 2009, 186).
- “It is important to note the different epistemology here from many quantitative projects. What is generally of interest is not so much the codes as the text they denote, not how often they occur but what is in them” (Crang 1997, 188).

# Coding

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- Coding is analysis
- Coding is used for whole-text analysis
- ‘Codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study. Codes are attached to “chunks” of varying size – words, phrases, sentences, or whole paragraphs, connected or unconnected to a specific setting’ (Miles and Huberman, 1994)
- Codes are used to retrieve and organize the data
- Various types of codes: descriptive codes, interpretive codes, pattern codes, etc.

# Coding your data set

## FORMAL DEFINITION

**'THE IDENTIFICATION OF PASSAGES OF TEXT (OR OTHER MEANINGFUL PHENOMENA, SUCH AS PARTS OF IMAGES) AND APPLYING LABELS TO THEM THAT INDICATE THEY ARE EXAMPLES OF SOME THEMATIC IDEA.**

**AT ITS SIMPLEST, THIS LABELLING OR CODING PROCESS ENABLES RESEARCHERS QUICKLY TO RETRIEVE AND COLLECT TOGETHER ALL THE TEXT AND OTHER DATA THAT THEY HAVE ASSOCIATED WITH SOME THEMATIC IDEA SO THAT THEY CAN BE EXAMINED TOGETHER AND DIFFERENT CASES CAN BE COMPARED IN THAT RESPECT'.**

# WHY CODE?



- ⦿ Minimize data overload
- ⦿ Some types of computer software can aid in content analysis
- ⦿ Useful in identifying themes and patterns
- ⦿ Can be used with many other methods ethnography, interviews, surveys, discourse analysis, focus groups



# HOW AND WHEN TO CODE?



- ◎ When do you develop your codes?
  - A priori, predefined, predetermined
  - Inductive, post-defined
  - Combination, accounting-scheme guide
  
- ◎ When do you code?
  
- ◎ Hand-coding versus Computer software

# Overview of the Process

1. An acknowledgment of the researchers' bias
2. Selection of a data collection site
3. Data collection process, concurrent with....
4. Coding and analysis:
  - Open and axial coding, employing constant comparison and memoing, resulting in themes, sub-categories, and core categories
  - Selective coding, also using constant comparison and memoing, resulting in dense, saturated core categories.
  - Theoretical coding: core categories are sorted theoretically and cross-referenced with literature.
- The result is a basic social process and a theoretical model.

# Analyzing Qualitative Data



- Read through your data and identify themes.
- Identify important sub-themes.
- Ensure consistency in the themes.
- Confirm depth of themes.
- Assign codes.

# How do You Prepare and Organize the Data?



- Develop a matrix or table of sources that can be used to organize the material
- Organize material by type
- Keep duplicate copies of materials
- Transcribe data
- Prepare data for hand or computer analysis (and select computer program)

# How do you Explore and Code the Data?



- Obtain a general sense of the data by performing a preliminary exploratory analysis
- Memo ideas
- Consider whether more data are needed
- Coding the data

# Overview of the Process

- An acknowledgment of the researchers' bias
- Selection of a data collection site
- Data collection process, concurrent with....
- Coding and analysis:
  - Open and axial coding, employing constant comparison and memoing, resulting in themes, sub-categories, and core categories
  - Selective coding, also using constant comparison and memoing, resulting in dense, saturated core categories.
  - Theoretical coding: core categories are sorted theoretically and cross-referenced with literature.
- The result is a basic social process and a theoretical model.

# Steps in Coding



- Read through all transcripts
- Start with one transcript
- Identify text segments – ask “what is this person saying?”
- Bracket text segment
- Assign code word
- Reduce redundancy
- Collapse codes into themes

# Coding



- 3 stages of analysis in coding
  - 1. Open coding: Find conceptual categories in the data
  - 2. Axial coding: Look at relationship between the categories
  - 3. Selective coding: To account for relationships, find core categories.



# Stage 1 : Initial coding

‘



Define, understand and explain what is happening in the data’

- ❑ Number each line in the data
- ❑ Code every new concept – keep this basic and do not attribute a feeling to the code. Simple codes such as ‘bereavement’. To code ‘loss’ would come later because attributing an emotion here.
- ❑ Code everything else, not just content in the data. For example, when the data was collected, where it was collected or if there were any external influences?

# Stage 1: Initial coding



- ❑ Outstanding
- ❑ Best interest
- ❑ Takes an interest
- ❑ Networking agencies
- ❑ Securing work experience
- ❑ Raises chances of employability
- ❑ Helps make new contacts
- ❑ Arranges networking events
- ❑ Dedicates time outside class
- ❑ Organised
- ❑ Communicates well
- ❑ Explains why
- ❑ Personal development
- ❑ Develops abilities
- ❑ Fantastic influence
- ❑ Credit to university
- ❑ Would have dropped out if not for lecturer

# Stage 2 : Focussed coding



SYNTHESISE THE MOST SIGNIFICANT/FREQUENTLY USED CODES ACROSS CASES TO CREATE CATEGORIES/THEMES/CONCEPTUAL SIMILARITIES.

- MOVE FROM INITIAL DESCRIPTIVE CODES, ONTO GROUPS OF CODES. THIS IS WHERE 'LOSS' WOULD BECOME RELEVANT.
- COMPARE YOUR DATA TO SEE IF THE SAME CODES ARE APPEARING.

# Stage 3 : Selective/theoretical coding



For example, if you had some initial codes of money, income, receipts. The selective code could be finance.

Ensure you hold coding meetings. Having more than 1 person help with coding adds creativity and validity to your analysis.

Keep a 'coding book' throughout the entire coding process. Include this in your appendix when writing your report.

# Stage 2&3...

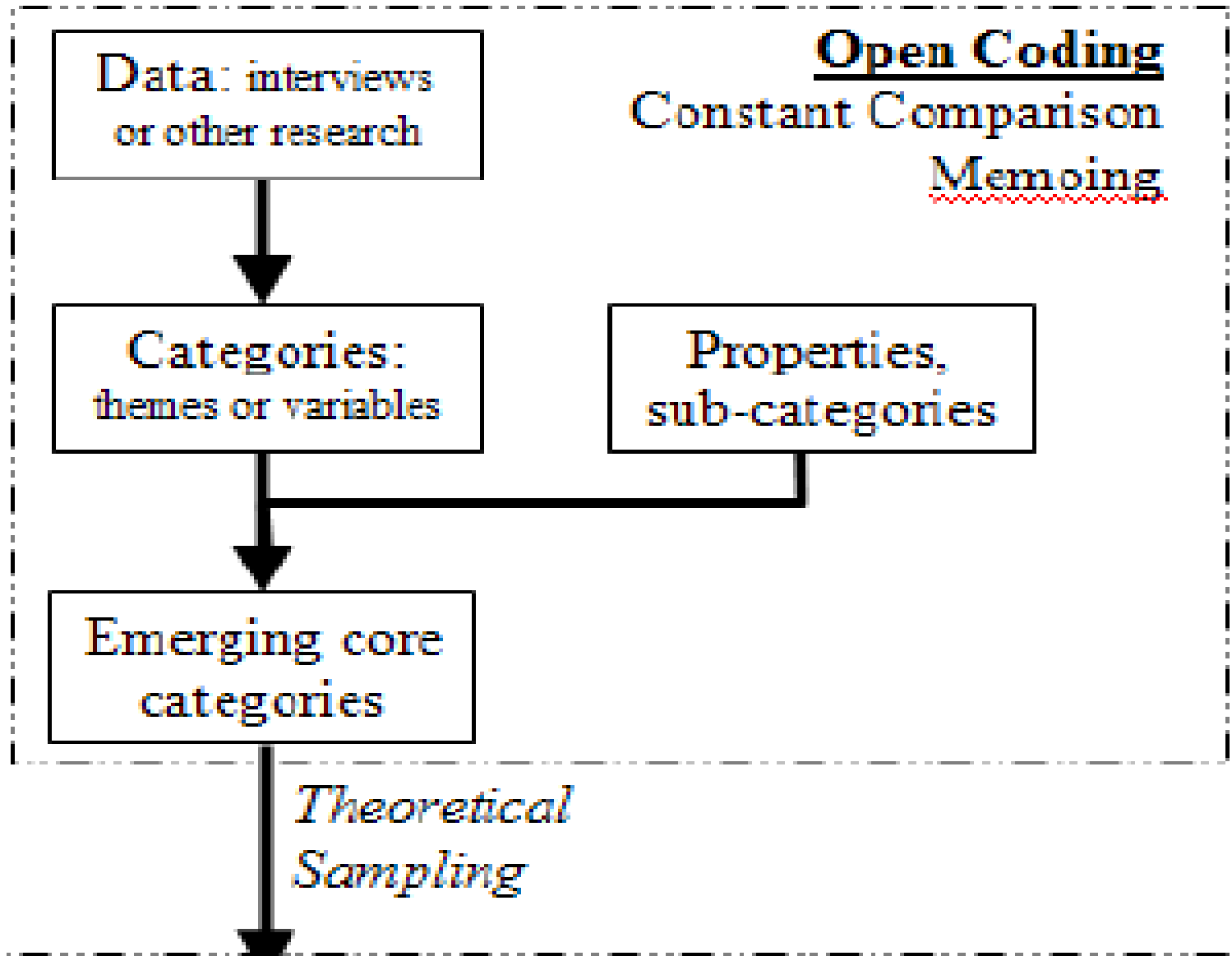


## **Stage 2: Focussed coding**

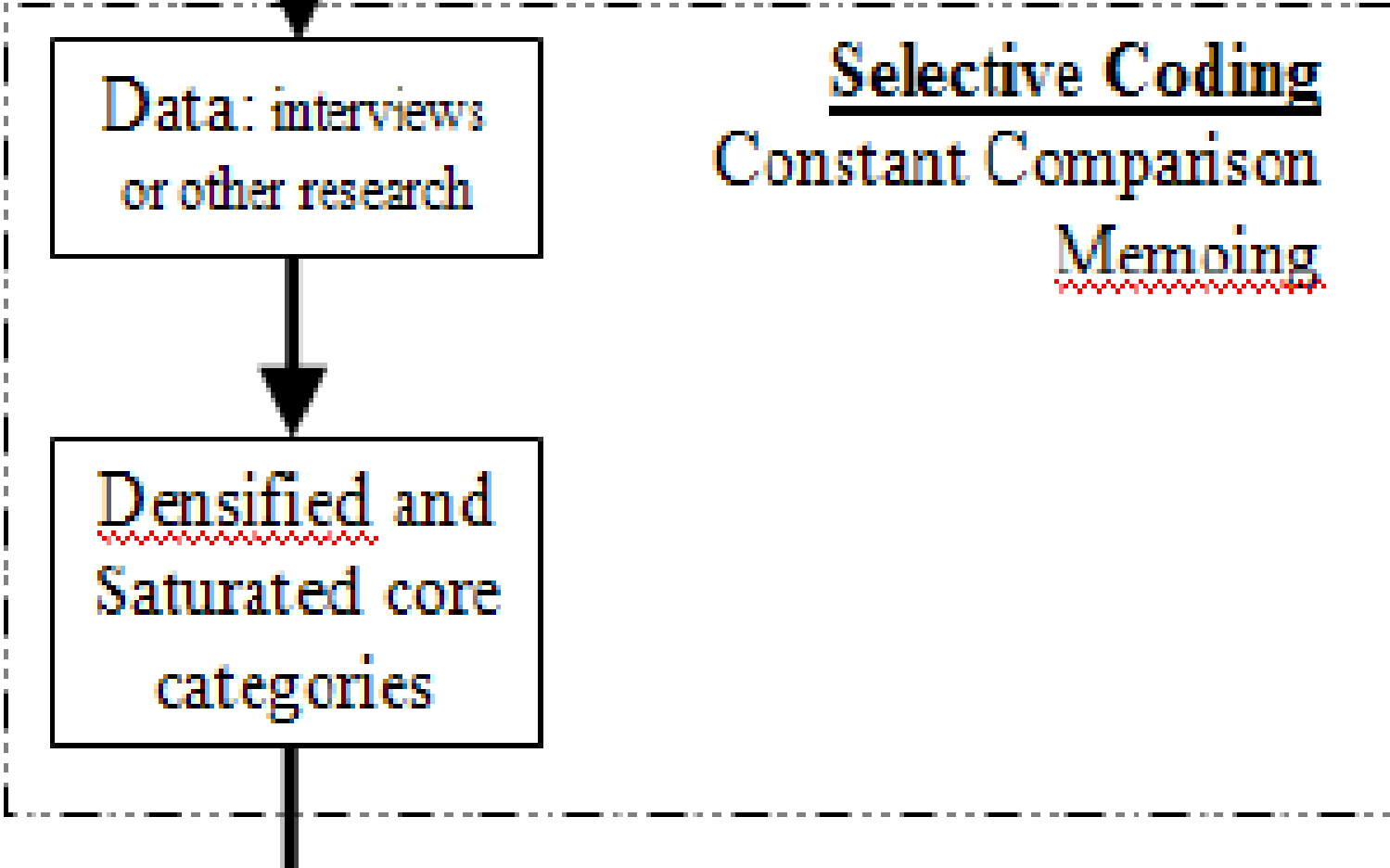
- Code 1: Organisation/style of teaching: 8, 10, 11, 12, 14, 3, 7, and 2
- Code 2: Skills: 1, 5, 7, 10, 11, 12, 14, and 17
- Code 3: Outside of classroom behaviour: 4, 5, 6, 7, 8, 9, 17, and 13
- Code 4: Employability opportunities: 4, 5, 6, 7, and 8
- Code 5: Admiration of lecturer: 15, 16

## **Stage 3: Selective coding**

- Improving employability prospects (Code 4)
- Adopting a style of teaching that moves beyond standard academic practices/teaching (Code 1, 2, 3)
- Admiration/Respect for lecturer (Code 5)



Continued on next slide



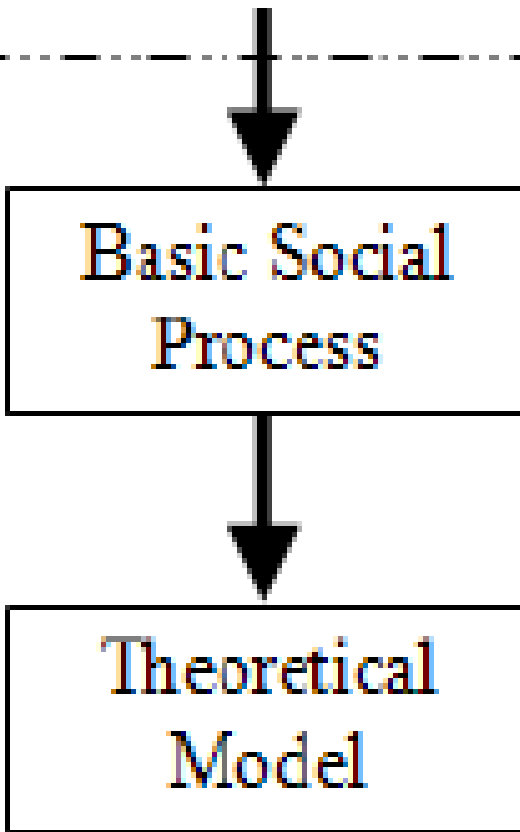
The diagram is a flowchart enclosed in a dashed black border. It starts with a downward-pointing arrow from the top center. Below it is a rectangular box with a solid black border containing the text 'Data: interviews or other research'. A thick downward-pointing arrow connects this box to a second rectangular box, also with a solid black border, containing the text 'Densified and Saturated core categories'. A vertical line extends from the bottom of this second box, passing through the bottom of the dashed border. To the right of the dashed border, the text 'Selective Coding' is underlined, 'Constant Comparison' is below it, and 'Memoing' is below that with a red wavy underline. The entire diagram is set against a light green background.

Data: interviews  
or other research

Densified and  
Saturated core  
categories

Selective Coding  
Constant Comparison  
Memoing

Continued on next slide

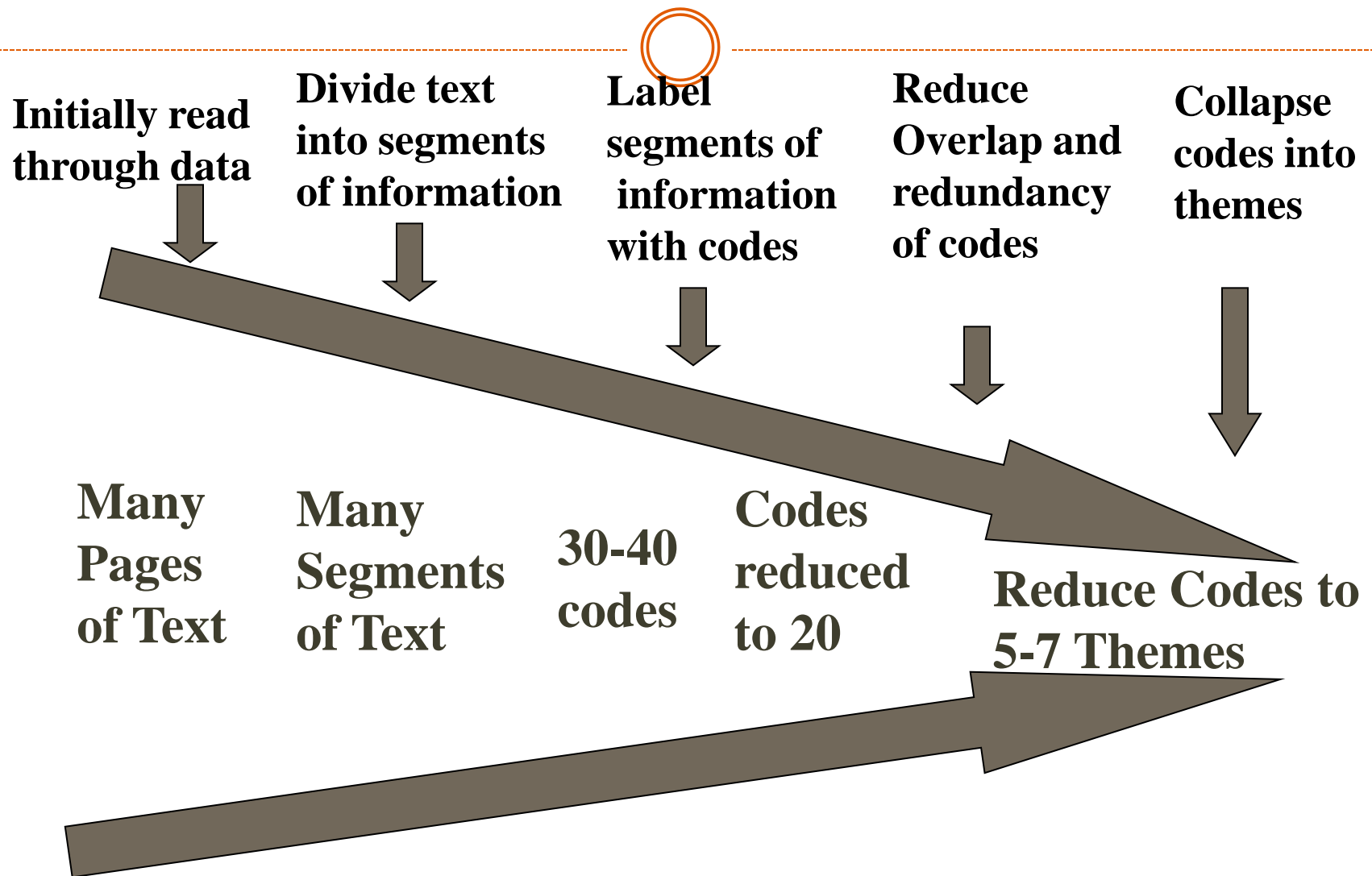


**Theoretical Coding**  
Sorting,  
writing/theorizing,  
cross referencing with  
literature

(Source: Jones and Alony, 2011)



# A Visual Model of the Coding Process in Qualitative Research



# Coding Methods



- Memoing - writing notes about the project.
- Concept mapping - graphically classifying individual pieces of data.

# Memos

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- Memos are in effect your own commentary on what was happening or what you were doing during your research project
- Esterberg (2002) says there are two main types of memos: procedural memos and analytic memos
- Procedural memos focus on the research process - they help you to keep track of what you have done
- Analytic memos focus more on the subject matter - they focus on the data and contain hunches and ideas about what the data mean

# Analytic Memo Writing



- Essential aspect of coding process
- Made up of reflections and ideas about coding
- Creates the link between raw data or evidence and formal theorizing and hypothesis creation

# Three Kinds of Memos for GTM



- **Code Notes** - identify code labels and their meanings.
- **Theoretical Notes** - reflect meaning of concepts and theories.
- **Operational Notes** -methodological issues.

# How do You Use Codes to Build Description?



- Describe
  - People
  - Events
  - Activities
  - Processes
- Describe in detail

# How do You Use Codes to Identify Themes?



- Ordinary themes
- Unexpected themes
- Social science themes
- Layering and connecting themes

# EXAMPLE & TYPES OF CODES



- **Sample field note:** “I asked him what the need for the new program was, and he responded that the students coming into 9<sup>th</sup> grade were two years below grade level and that the old curriculum was ineffective. Through testing...it was determined that students were growing academically only 5 or 6 months during the 10-month school year.”
- **Descriptive Code:** MOT = Motivation
- **Interpretive Code:** PUB-MOT = Public Motivation

(Miles & Huberman 1994, 57)



# EXAMPLE & TYPES OF CODES



- ◎ **Pattern Codes:** Inferential and Explanatory. Used when a “segment of field notes illustrates an emergent leitmotiv or pattern that you have discerned in local events and relationships.”
- ◎ Analogous “to the cluster-analytic and factor-analytic devices used in statistical analysis.”
- ◎ **Sample Codes:**
  - LM = Leitmotiv
  - PATT = Pattern
  - TH = Theme
  - CL = Casual Link

# Validity & Reliability



- **Validity**
- How can we be sure we are measuring what our we set out to? To what extent are we describing and measuring what our research question set out?
- As qualitative researchers we need to be able to account for how inferences were made in our analysis and our conclusions reached. This is the only way our findings are credible.
- Create an analysis group – through having different people analysing the data set, your validity will increase.

# Reliability



- If we repeated the research, would we find the same results?
- *Objectivity needs to be embedded into the research process. Demonstrating reliability through keeping detailed records of the links between the claims you are making and the evidence on which it is based.*
- Be aware of the boundaries of the claims that you make from analysing your qualitative data and remain transparent throughout your analysis about all of the processes that you have used.
- Are there any instances that contradict the claim that you are making? Disruptions can exist and not contradict your argument. Be upfront about these anomalies and this will help your reliability.

# Cohen's Kappa

## Cohen's Kappa

$$\kappa = \frac{P_A - P_c}{1 - P_c}$$

### Inter coder reliability

$P_A$  is the proportion of units on which the ratters agree

$P_c$  is the proportion of units for which agreement is expected by chance

0.00 = poor agreement

0.21 – 0.40 = fair agreement

0.81 – 1.00 = high agreement

# Series of Events

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- An event listing is a series of events organized by chronological time periods
- The events can possibly be sorted into categories
- Some events occur before others and are connected. These can be in narrative form or summarized in a table form or flow chart

# Critical incidents

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- A shorter form of the series of events
- This is a listing only of those events that are deemed by the researcher to be extremely important and pertinent to the research
- Events can also be states (e.g. alarm at failure rate)

# Debate preparation



- Set up teams
- Identify speakers
- Prepare arguments for/against
- Topic: 'That qualitative research is better than quantitative research'

# Choosing a qualitative data analysis approach



- Do you find the approach interesting?
- Is the approach reasonably consistent with your own philosophical assumptions about knowledge and reality?
- Is the approach reasonably consistent with the research method you employed?
- Have you gathered the right quantity and quality of data for the particular qualitative data analysis method?
- Do you have a supervisor or some other faculty member who can provide advice and guidance on the use of your preferred approach?



# Maps, tables, flow charts and diagrams in Qualitative Data Analysis

# Use for...



- Clarification in elicitation process (share with respondents)
- Develop ideas about a model, processes etc.
- Illustrate examples and your argument
- Lay out data so that patterns can be discovered
- Data reduction

# PRESENTING QUALITATIVE DATA

TYPE OF QUALITATIVE DATA COLLECTION	FORMS OF DATA PRESENTATION								
	Quotations	Simple Tables	Matrices	Maps Diagrams	Taxonomies	Scales (Single ...MDS)	ETHNOGRAPHIC MODELS		
							Conceptual	Behavioral	Conceptual-Behavioral
Unstructured Direct Observations	**	****	****	*****				***	***
Structured Direct Observations		****	****	**				*****	****
Key Informant Interviews	*****	****	****	***	****	*	*****	**	**
Focus Groups	*****	****	****	***	**	*	****	***	***
PRA Group Techniques		****	****	*****	**	***	*	**	**
Free Lists	**	*****			**		*	*	
Pile Sorts Triads	**		**	**		*****	*****	***	
Paired Comparisons		***	***			*****	***		

\* less useful → most useful \*\*\*\*\*

less complex → more complex

# Choice of Forms of Presentation

**mode of presentation: from simpler to more complex forms**

- start with quotes

**complexity**

- don't want to lose people by complex arguments

**data sufficiency & reliability**

- describe triangulation if used, ie all methods produce same information (or didn't)

# Choice of Forms of Presentation

**select forms of presentation which best explain the data**

**be creative: these are not the only forms available, they are modifiable**

**know your audience**

- do you have to explain terms/concepts you use?  
if so, do it well

## Use of visuals

Best speeches ever, except perhaps one of the first,  
were made without visual enhancements

One of the earliest used two stone tablets

# Quotes

**quotes should support themes**

**balance between excessive analysis, and lengthy quotes without any analysis**

- "analysis is the **search for patterns in data** and for ideas that help explain why those patterns are there in the first place" *Bernard*

**“smoking is a handicap. Other handicapped people get ramps and such things. Smokers get kicked out.”**

# Quotes

**quotes are memorable, may be the only  
aspect of your paper/presentation people  
remember**

**your EXAMPLES.....**



# Maps/Diagrams

**patient's home**



**social map of area**

- Slides or photographs

**body map**

# CARTOONS

Very culture dependent, if you use, know your audience and the effect it will have

## Examples

- Following cartoon, I use for my tourism and health of local populations talk, at the end

# PHOTOGRAPHS

A thousand words



Concern about exploiting people financially by showing their photographs

Ethical issues

Cultural issues as well in sense that photograph steals the soul

Permission and model release

# Multiple Methods



“Rather than taking sides on this recurring issue, we suggest that multimethods approaches can provide a more accurate and detailed research project than the traditional unidimensional (qualitative or quantitative) approaches provide”

-Mitra & Lankford, 1999, p. 46

# Schedule Development



- **Demographic questions locate person**
  - Record age, gender, ethnicity/race without asking.
  - Record status: student, faculty, advisor, administrator.
  - Ask what is or was their major
  - Depending on purpose of interview other demographic (locational) items may be appropriate

# Schedule Development



- **Essential Questions**
  - These are asked of everybody
  - Try to order them, but be flexible about order during interview
  - Follow up questions under each essential question to check clarity or understanding
  - Extra questions on each essential question to ask at different point to assess reliability of answers

# Schedule Development



- **Throw-Away Questions**

- Used to develop rapport, provide context. For example, a question about related topics, about sports/fraternities or something else you think they like.
- Used to redirect away from problems where things get too upsetting.
- Used to keep participant engaged in interview.

# Schedule Development



- Probes
  - Try to develop these for each essential question by anticipating how to probe when an answer is inadequate—too short, not specific.
  - Basic question: How do you feel about having so few male students in HDFS classes? Answer—OK. Probe—What do you mean by OK? Probe—How come?
  - Silence is a great probe—people can't stand it.
  - Echo their answer with an even shorter response and then ask if they can say more about it.



# Preparing and managing your data set



- **Leave large margins for annotations**
- **Do not tidy the language – although it is tempting to correct language and make it more your own style...resist!**
- **Keep your field notes to hand when analysing your data set.**

# Using CAQDAS for qualitative analysis (1)



## Summary of functions

- Structure of work
- Closeness to data and interactivity
- Explore the data
- Code and retrieve
- Project management and data organisation
- Searching and interrogating
- Writing memos, comments and note
- Output

Lewins and Silver (2006)

# How do You Represent Findings?



- Comparison table
- Descriptive table
- Hierarchical tree
- Figures/diagrams
- Drawings

# Writing up your findings



- What have you found? In many cases what you write may be analytic ideas. In other cases it may be some form of précis or summary of the data, though this usually contains some analytic ideas.
- Make it your own!
- Ensure you evidence reliability and validity and include your coding book in your appendix

# How do You Report Findings?



- Multiple perspectives for each theme
- Metaphors and analogies
- Quotes
- Detail
- Tensions and contradictions

# How do You Interpret Findings?



- Interpretation is not neutral
- Reflect about the personal meaning of the data
- Compare and contrast personal viewpoints with the literature
- Address limitations of the study
- Make suggestions for future research

# How do You Validate the Accuracy of Your Findings?



- Member checking: Members check the accuracy of the account
- Triangulation: Using corroborating evidence
- External: Hiring the services of an individual outside the study to review the study

# Data Analysis

“a lot of hard work” (Polit & Hungler 1993)



- Thematic and pattern analysis
- Content analysis
- Burnard's 14 stage analysis



# Burnard's 14 Stage Analysis



1. Note taking
- 2. Immersion in data
- 3. Open coding
- 4.-5. Reduction & Refinement
- 6. Checking
- 7.-8. Re-reading & categorisation
- 9.-10. Rearrangement of data
- 11. Informant checking
- 12-14. Preparing to write, report writing, linking to literature

# Burnard's 14 stages for analysing qualitative interview



<b>Stage</b>	<b>Description</b>
Stage one	Writing memos after each interview to help categorizing the data later on
Stage two	Immersion in the data by reading through the transcript again and again with notes made

# interview



## Stage three

Reading through the transcript and try to generate headings or categories and written it down through the transcript.

## Stage four

Listing of the categories to avoid categories collapsing

## Stage five

Develop new list for categories and subheadings

# Burnard's 14 stages for analysing qualitative interview



## Stage six

Validate the categories by asking two college to read through the transcript and independent categories

## Stage Seven

Read the transcript along side the agreed list of categories to ensure that the categories covered all aspect of the interviews

## Stage eight

Work the transcript against the agreed list and subheading. By using colour highlighting pens to distinguish each category and the piece of transcript related to it

# Burnard's 14 stages for analysing qualitative interview



## Stage nine

Cut out the transcript according to the coding categories and collecting each coded section in file

## Stage ten

Past the cut out sections onto sheets headed up with categories and sub categories

## Stage eleven

Check whether the quotations fit with categories Keep all the complete interviews and all section in a file together for direct reference

# Burnard's 14 stages for analysing qualitative interview



**Stage thirteen**

**Writing up process, starting section by section**

**Stage fourteen**

**Deciding wether or not writing the finding with or without the discussion**

# Matrix Displays



Not everyone is visually oriented to them

Trying to produce good ones help you understand your data,

- is analysis

Involves information crossing two dimensions to see how they interact

# Matrices

**Table 2** Comparison of staff responses to the question “Which birth control method do you think is best?”

Client and situation	Response			
	Clinic 1	Clinic 2	Clinic 3	Clinic 4
Couple in their late 30s to early 40s with several grown children.	Sterilize if woman is under age 40; otherwise nothing is necessary.	Sterilize if woman is under 40; otherwise use a temporary method.	Sterilize.	Sterilize if woman is under 40; otherwise use a temporary method.
Newly married couple who want to delay first child.	Condoms.	Condoms.	Condoms (never pills or Depo-Provera).	IUD.
Low caste, uneducated couple.	No specific method (not condoms).	IUD (but clients usually refuse).	IUD (but clients usually refuse).	IUD.
Couple with 2–4 daughters and no son.	No specific method (never sterilize).	No specific method (never sterilize).	Depo-Provera (never sterilize).	IUD or pills (never sterilize).
Educated couple with 1–2 small children, who say they definitely don't want and can't afford another child.	Sterilize if youngest is over 5 years old.	Sterilize if youngest is over 5 and couple has at least one son.	Sterilize if youngest is over 5.	Sterilize if youngest is over 5.



**Figure 3****Reasons to Smoke Outside the Workplace**

<b>Method</b>	<b>Type of Information obtained</b>	<b>Conclusion</b>	<b>Next Investigative Step</b>
<b>Key Informant interview</b>	general information regarding people's perception of smoking outside the workplace	some people clearly see they are addicted, others claim naivety	Observation of the activity
<b>Direct Observation</b>	varied appearance of the activity, not clearly seen as relaxing when hurriedly done outside the workplace	confirms addictive behavior	gather more information on places people smoke besides outside the workplace
<b>Free Lists</b>	names for places where people smoke	clearer understanding of reasons people smoke outside the Workplace	obtain information on how much people smoke in different locations
<b>Pile Sorts</b>	Relative frequency of where people smoke	People smoke more in confined locations than before and expose others and themselves to side stream smoke	See how the frequency of cigarettes smoked has changed as a result of the ban
<b>Paired Comparisons</b>	Changes in locations of where people smoke as a result of the ban	Smoking outside buildings has increased exposure of people to side stream smoke NOT born out by our small sample size, but warrants further investigation	Confirmation by Focus Groups, and consideration of cessation attempts
<b>Focus Group Discussions</b>			Plan an intervention to help those smoking outside buildings to stop

# ***Example qualitative table.***

## ***Descriptions of people with degrees***

	<b>Has science degree</b>	<b>Non-science degree</b>	
<b>Male</b>	<i>Cell 1,1</i> Reliable, steady, dull, numerate, traditional, clever, laddish	<i>Cell 1,2</i> Artistic, sociable, ordinary, unreliable, unworldly	
<b>Female</b>	<i>Cell 2,1</i> Individualistic, dogmatic, clever, masculine, inspirational, numerate	<i>Cell 2,2</i> Arty, feminine, bookish, traditional, radical,	

# Character of company departments

	Marketing dept.	Production Dept.
Comp-biz	<p><b>Small size</b>, “We try to keep our staffing cut to the bone”</p> <p><b>high tur nover</b>, “You’re considered an oldie if you’ve been here longer than 2 years!”</p>	<p><b>Outsources</b>, “We’ve found it impossible to produce at a competitively low price in the UK”</p> <p><b>high tur nover</b>, “Most folk don’t last long in production...”</p>
Code-Co	<p><b>Medium sized</b> “The company has about 80 staff now”</p> <p><b>older staff</b> “One department, and that’s typical, will lose half its staff to retirement in the next 5 years.”</p>	<p><b>High tur nover</b> “We suffer from people finding better paid jobs in local factories”</p> <p><b>local pro duction</b>, “We struggle, but it’s a matter of pride to produce our own kit.”</p>

# Summary responses by codes



- *Cells contain typical or summaries of text from respondents*
- *E.g. Job search strategies by gender*

# Job search strategies by gender

	Female	Male
<b>Routine</b>	<p><i>Cell 1,1</i></p> <p>My routine's determined by childcare requirements (Pauline). I get the paper every day, without fail (June).</p> <p>I used to go down Racetrain a lot, ... I also joined Job Club... I kept a file and a record of all the letters I received (Sharon)</p>	<p><i>Cell 1,2</i></p> <p>I used to spend mornings going through the papers. I either used to buy papers or go down to the library. Afternoons writing off to places for information or filling application forms in, and then evenings for the evening papers, again. (Jim)</p> <p>Just the same pattern all through the week (Harry).</p>
<b>Haphazard</b>	<p><i>Cell 2,1</i></p> <p>Not really, I just do it. It happens (Susan).</p> <p>Not really, because my husband works shift work (Mary).</p>	<p><i>Cell 2,2</i></p> <p>No routine, but I keep meself busy, like – keep meself occupied – I've plenty of gardening to do (Dave).</p> <p>No, not really. I usually go down and have a look Monday, Wednesday, Friday, something like that (Andy)</p>
<b>Entrepreneurial</b>	<p><i>Cell 3,1</i></p> <p>Personal approaches to firms and through friends. (June)</p>	<p><i>Cell 3,2</i></p> <p>I ... spend ... a couple of days every week with a company. I make sure that they know th at I'm there (John).</p>

# Case by codes with exemplars



- *Example of a comparison between cases*
- *These are good for investigating differences by code or by case*

	<b>Work background</b>	<b>Vacancy searching accounts</b>	<b>Job search breadth</b>
<b>Harry</b>	<i>Cell 1,1</i> Caretaker	<i>Cell 1,2</i> “[The] other applicant... had a car and it were funny hours working and he had advantage of being there on time, so that's why he got it.”	<i>Cell 1,3</i> “Not really away from town.” (local)
<b>Pauline</b>	<i>Cell 2,1</i> Supply teaching	<i>Cell 2,2</i> “I got the interview, so I treated it as a trial run. Really, I didn't think.”	<i>Cell 2,3</i> “Bonstreet” (local)
<b>June</b>	<i>Cell 3,1</i> Clerk at a solicitors	<i>Cell 3,2</i> “when she told me how much they were paying ... it would be like going back to square one”	<i>Cell 3,3</i> “I told them, ‘I'm quite willing to relocate, but only to North East England.’”

# Time ordered matrix



- *Example of a comparison within a single case.*
- *e.g. influence of time on code type.*

<b>Code type</b>	<b>Time 1</b>	<b>Time 2</b>	<b>Time 3</b>
<b>Type 1</b>	<i>Quote 1</i>	<i>etc</i>	
<b>Type 2</b>			
<b>Type 3</b>			



## ***Example of a comparison within a single case***

	<b>First interview</b>	<b>Second interview</b>	<b>Third interview</b>
<b>Pain management</b>	<p><i>Cell 1,1</i></p> <p>“At first I was worried I might run out of pain killers.”</p>	<p><i>Cell 1,2</i></p> <p>“I try to avoid taking pain killers because of the side effects.”</p>	<p><i>Cell 1,3</i></p> <p>“There are times when I find the drowsiness better than the pain.”</p>
<b>Help from relatives</b>	<p><i>Cell 2,1</i></p> <p>“My husband did his best to help, but he’s never done much cooking.”</p>	<p><i>Cell 2,2</i></p> <p>“Fred went to evening classes on cooking. I think he quite enjoys himself now.”</p>	<p><i>Cell 2,3</i></p> <p>“I don’t know what I’d do if Fred got ill, my children live so far away.”</p>
<b>Independence</b>	<p><i>Cell 3,1</i></p> <p>“I think I was so self absorbed with the illness that I didn’t worry about getting help.”</p>	<p><i>Cell 3,2</i></p> <p>“I find it very frustrating having to get Fred or someone else to move and lift things for me.”</p>	<p><i>Cell 3,3</i></p> <p>“With the new equipment I feel a lot more in control.”</p>

## ***Tables or matrices cont.***

- ***Tables can include counts, e.g. Size of coded text (number of words) or no. of coded chunks of text***
- ***This may indicate importance or salience (or not?)***

# Quasi-quantitative.



- ***Recode or categorize the concept/variable.  
E.g. into high or low, good or bad etc.***
- ***Cf. Grounded theory idea of properties and dimensions.***

# Analysis of Nominal and Ordinal Data



- **CONSTRUCTION AND ANALYSIS OF CONTINGENCY TABLES**
- **STATISTICAL AIDS FOR INTERPRETATION**
- **CONTROL TABLE ANALYSIS**

# Construction and Analysis of Contingency Tables



- We have previously discussed levels of measurement (nominal, ordinal, interval), and the measures of central tendency and dispersion that can be used to summarize a group of data – This was single variable or “univariate” statistics
- This type of analysis is common, but generally reflects the first step in the analysis of a problem



- Imagine you work in the Public Affairs department of a large state agency
- Just finished annual survey of public opinion toward the agency
- Initial results show most people feel agency is doing a “very poor job” with a median of “poor job”
- This is a dramatic downturn from previous years
- Now that you have done the descriptive, univariate statistics, what do you do?



- You DON'T want to give this information to the agency director without some idea of how the public image of the agency might be improved
- You need to consider WHY public support has fallen
- Perhaps program cuts hit a particularly populous county harder than others
- Perhaps the new director has a bad reputation “Mean” Gean Maculroy they call him
- Either explanation would result in completely different approaches to improving the public image of the agency
- In both, we want to know the “relationship” between TWO variables (county and opinion, view of director and opinion)



- The method that is most employed to quickly analyze the relationship between two variables is called *Contingency Table Analysis* or the analysis of *Cross-tabulations (Cross-tabs)*
- Here we will learn how to construct cross-tabs and interpret them



# Matrices



- *Simple, like crosstabs. Exclusive values in each cell*

**Or**

- *Non-exclusive values in each cell*

**See:** Ritchie, J. and Lewis, J. (eds) (2003)  
*Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage.

# Percentage Distributions



- First, though, we will review percentage distributions, as they are integral to cross-tabulations
- As we have explored before, a percentage distribution is simply a frequency distribution that has been converted to percentages
- It tabulates the percentage associated with each data value or group (class) of data values

# Percentage Distributions

- Consider this table of responses to whether or not there are “too many” bureaucrats in the federal government
- Mode is “Agree”, but still difficult to interpret
- Percentages would make it easier to interpret and compare to previous years

<b>Response</b>	<b>Number of People</b>
<b>Strongly Agree</b>	<b>686</b>
<b>Agree</b>	<b>979</b>
<b>Neutral</b>	<b>208</b>
<b>Disagree</b>	<b>436</b>
<b>Strongly Disagree</b>	<b>232</b>
	<b>2,541</b>

# Steps in Percentaging



- The steps for Percentaging are easy:
- 1. Add the number of people (frequencies) giving each of the responses. In our table that's  $686+979+208+436+232=2,541$
- 2. Divide each of the individual frequencies by this total and multiply the result by 100. For “Strongly Agree” we divide 686 by 2,541, then multiply by 100 = 26.997



# Displaying and Interpreting Percentage Distributions

- It is clear from this distribution that most respondents “Agree” with the statement and that the extent of “general agreement” far outweighs the extent of “general disagreement”

Response	Percentage
Strongly Agree	27.0
Agree	38.5
Neutral	8.2
Disagree	17.2
Strongly Disagree	9.1
Total	100.0
	N = 2,541

# Collapsing Percentage Distributions

<b>Response</b>	<b>Percentage</b>
<b>Strongly Agree or Agree</b>	<b>65.5</b>
<b>Neutral</b>	<b>8.2</b>
<b>Disagree or Strongly Disagree</b>	<b>26.3</b>
<b>Total</b>	<b>100.0</b>
	<b>N = 2,541</b>

- It is perfectly ok to collapse percentage distributions as long as the categories are close in substantive meaning (e.g. you can't include Neutral with either collapsed category)
- The only time you can violate that rule is when dealing with nominal variables where there are many categories with little data (e.g. Protestant 62%, Catholic 22%, Jewish 13%, Other 3%)

## In-Class Task

- Construct a collapsed percentage distribution of the data here
- How would you collapse it?
- One will present

<b>Where do people shop?</b>	
<b>Main Store Named (and location)</b>	<b>Number of Persons</b>
Cleo's (neighborhood store)	5
Morgan's (downtown)	18
Wiese's (eastern shopping center)	12
Cheatham's (neighborhood store)	2
Shop City (eastern shopping center)	19
Food-o-Rama (western shopping center)	15
Stermer's (downtown)	7
Binzer's (neighborhood store)	2
England's (western shopping center)	1
Bargainville's (eastern shopping center)	26
Whiskey River (downtown)	13
	120

# Contingency Table Analysis



- A “univariate” frequency distribution simply presents the number of cases (or frequency) taking each value of a given variable
- A “bivariate” frequency distribution presents the number of cases that fall into each possible pairing of the values or categories of two variables simultaneously



# Constructing Contingency Tables

- Consider the variables “race” and “gender” for volunteers to the Klondike Expressionist Art Museum
- There are four possible pairings

<b>“Gender”</b>	<b>“Race”</b>
<b>Female</b>	<b>White</b>
<b>Male</b>	<b>Nonwhite</b>

# Constructing Contingency Tables

- The cross-tabulation of these two variables displays the number of cases (volunteers) that fall into each of the race-gender combinations
- Called a “cross-tabulation” precisely because it crosses (and tabulates) each of the categories of one variable with each of the categories of a second variable

**Race and Gender of Volunteers to Klondike Expressionist Art Museum**

<b>Sex</b>	<b>Race</b>		<i>Total</i>
	<i>White</i>	<i>Nonwhite</i>	
<i>Male</i>	<b>142</b>	<b>109</b>	<b>251</b>
<i>Female</i>	<b>67</b>	<b>133</b>	<b>200</b>
<b>Total</b>	<b>209</b>	<b>242</b>	<b>451</b>

# Terminology

- **Cell**
  - The cross-classification of one category each from two variables
- **Marginals**
  - The totals of each column and the totals for each row
- **Grand Total**
  - The total number of cases represented in the table (N)

**Race and Gender of Volunteers to Klondike Expressionist Art Museum**

	<b>Race</b>		
<b>Sex</b>	<i>White</i>	<i>Nonwhite</i>	<i>Total</i>
<i>Male</i>	<b>142</b>	<b>109</b>	<b>251</b>
<i>Female</i>	<b>67</b>	<b>133</b>	<b>200</b>
<b>Total</b>	<b>209</b>	<b>242</b>	<b>451</b>

# In-Class Task



- Create a cross-tabulation called “Relationship between Type of Employment and Attitude toward Balancing the Federal Budget”
- The variables of interest are “type of employment” (public, private, nonprofit) and “attitude toward balancing the federal budget” (approve, disapprove)
- The cell frequencies are: public-disapprove 126; public-approve 54; private-disapprove 51; private-approve 97; nonprofit-disapprove 25; nonprofit-approve 38

# Relationships Between Variables



- Managers make and analyze cross-tabs because they are interested in the relationship between two variables
- A *statistical relationship* is a recognizable change in one variable as the other variable changes
- The cell frequencies of a cross-tabulation provide some information regarding whether changes in one variable are statistically related to changes in another

# Relationships Between Variables



## Relationship between Educational Level and Performance on Civil Service Examination

Performance on Civil Service Examination	Education		Total
	High School or Less	More Than High School	
Low	100	200	300
High	<u>150</u>	<u>800</u>	<u>950</u>
Total	250	1,000	1,250

# Analysis Process



- Step 1 – Determine which variable is *Independent* and which is *Dependent*
- Independent variable – the anticipated causal variable – the one that leads to changes or effects in the other variable
- Dependent variable – the one that gets influenced

# Analysis Process



- Stated as a Hypothesis: the higher the education, the higher the expected score on the test
- So, education is the independent variable and performance on the test is the dependent variable



# Analysis Process



- Step 2 – Calculate percentages within the categories of the *independent* variable
- In this case, education
- We would like to know the percentage of people with high school education or less (low education) who received high scores on the exam and the percentage of people with more than a high school education (high education) who received high scores
- We could then compare and test our hypothesis

- Go ahead and calculate the percentages within the categories of the independent variable

## Relationship between Educational Level and Performance on Civil Service Examination

Performance on Civil Service Examination	Education		Total
	High School or Less	More Than High School	
Low	100	200	300
High	<u>150</u>	<u>800</u>	<u>950</u>
Total	250	1,000	1,250

# Analysis Process



- Step 3 – Compare the percentages calculated within the categories of the **independent variable** for **one** of the categories of the **dependent variable**
- For example, whereas 80% of those with high education earned high scores on the civil service examination, only 60% of those with low education did so.
- Therefore, our hypothesis is supported by these data

# Analysis Process



- Step 4 (optional) – Calculate a percentage difference across one of the categories of the dependent variable
- Not usually included in the table, but in the write-up discussing support for the hypothesis
-

# In-Class Task



- Automobile Maintenance in Berrysville handout

# Larger Contingency Tables



- In cross-tabs larger than 2 x 2 analysis is conducted using the same process
- However, the choice of which category of the Dependent Variable is selected for analysis requires more care (it doesn't matter in a 2x2 table)
- Avoid intermediate categories – choose an endpoint category – choose “low” or “high” in a “low”, “medium”, “high” variable
- Do the same for the Independent Variable

# In-Class Task



- Relationship between Income and Job Satisfaction handout



**Hypothesis 1:** The higher the income, the higher the job satisfaction

**Hypothesis 2 (corollary):** The lower the income, the lower the job satisfaction



# Which one should you use?



- Since they both confirm your hypothesis, but to a different degree, report BOTH.
- Income appears to make a difference of 37% to 47% in job satisfaction.
- What if the two disagree?
- Then you really can't draw a conclusion. The problem is more complex than you thought and you'll have to revisit what you thought the relationship was and how you have phrased the question.

# Displaying Contingency Tables



- Conventions for the display of contingency tables or cross-tabs
  - Don't show the raw frequencies – just show the percentages
  - The independent variable is placed along the *columns* of the table
  - The dependent variable is positioned down the *rows* of the table
  - The independent variable (if ordinal) should progress from left to right (least to most)
  - The dependent variable (if ordinal) should progress from top to bottom (least to most)
  - The percentages calculated within the categories of the independent variable are summed down the column with a total at the foot of the respective column
  - The total number of cases (n=) is listed below the total percentage for each column

# Conventional Format for a Contingency Table



<b>Dependent Variable</b>	<b>Independent Variable</b>			
Substantive meaning of categories increases	Substantive meaning of categories increases (e.g., "low," "medium," "high") 			
	_____%	_____%	_____%	_____%
↓	_____%	_____%	_____%	_____%
↓	_____%	_____%	_____%	_____%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
	(n = ____)	(n = ____)	(n = ____)	(n = ____)

# Computer Printouts



- Be careful with computer contingency tables (like excel)
- The “wizards” can give three different percentages
  - Columns
  - Rows
  - Percentage of Total Table
- It doesn't know any better – you need to know better!

# In-Class Problems



- Teams of 2
- Prepare and present

# Question 1



- The Lebanon postmaster suspects that working on ziptronic machines is the cause of high absenteeism. More than 10 absences from work without business-related reasons is considered excessive absenteeism. A check of employee records shows that 26 of the 44 ziptronic operators had 10 or more absences and 35 of 120 non-ziptronic workers had 10 or more absences. Construct a contingency table for the postmaster. Does the table support the postmaster's suspicion that working on ziptronic machines is related to high absenteeism?

## Question 2



The Egyptian Air Force brass believe that overweight pilots have slow reaction times. They attribute the poor performance of their air force in recent war games in the Sinai to overweight pilots. The accompanying data were collected for all pilots. Analyze these data for the Egyptian Air Force.

	<b>Pilot Weight</b>		
<b>Reaction Time</b>	Normal	Up to 10 Pounds Overweight	More than 10 Pounds Overweight
Poor	14	36	45
Adequate	35	40	33
Excellent	46	25	15

# Question 3



The state personnel office oversees the state's tuition assistance program, which pays the tuition of civil servants taking courses for an MPA. Only two schools offer an MPA degree in the state capital, Capital College of Law and East Winslow State University. Some concern is expressed by legislators that many tuition-assisted students do not graduate. Analyze the data in the accompanying table for the personnel office.

	<b>Students Assisted for MPA Tuition</b>	
<b>Status</b>	Capital	East Winslow
Did not graduate	69	83
Graduated	23	37



# Question 4



As head scheduler of special events for the Incomparable Myriad (the city arena), your task is to schedule events that make a profit so that the city need not subsidize the arena. Analyze the data in the accompanying table, which is based on last year's data, and report to the city council.

	Type of Event				
Status	Hockey Games	Religious Rallies	Basketball Games	Rock Concerts	Public Administration Conventions
Not Profitable	24	4	21	2	3
Profitable	18	32	6	8	0

# Question 5



The Cancer Institute is evaluating an experimental drug for controlling lip cancer. Eighty lip cancer victims are randomly selected and given the drug for 1 year. Sixty other lip cancer victims are randomly selected and given a placebo for a year. From the data in the accompanying table, what would you conclude?

Cancer Status	Drug Group	Placebo Group
Active	58	42
Remission	22	18

# Question 6



A professor of public administration has kept records on the class participation of his students over the past several years. He has a strong feeling (hypothesis) that class participation is related to grade in the course. For this analysis he classifies course grades into two categories, fail and pass. He operationalizes class participation as “low” if the student participated in class discussion in fewer than 25% of class periods, and “high” if the student participated in 25% or more of the periods. Based on these definitions, he has assembled the cross-tabulation below. Does a relationship exist between class participation and course grades?

	Class Participation	
Grade in Course	Low	High
Fail	56	15
Pass	178	107

# Question 7



Madonna Lewis's job in the Department of Sanitary Engineering is to determine whether new refuse collection procedures have improved the public's perception of the department. Public opinion surveys were taken both before and after the new procedures were implemented. The results appear in the accompanying table. Analyze the table, and evaluate whether public perception of the department appears to have improved over time.

Opinion	Before	After
Department is doing a poor job	79	73
Department is doing a good job	23	47

# Statistical Aids for Interpretation



- So we now know how to determine if two nominal or ordinal variables are related statistically using a contingency table and percentages
- But now we have to ask, “How strong” is that relationship?
- Can we say that the relationship is “strong enough” to have not occurred by chance?

# Chi-Square Test: Statistical Significance for Contingency Tables



- A procedure for evaluating the level of **statistical significance** attained by a **bivariate** relationship in a **cross-tabulation**
- **Statistical Significance** – how confident can we be that this sample of data represents its parent population? (We will get into this in more detail next week, but this definition is sufficient for now)
- **Chi Square** – assumes there is “no relationship” between the two variables and determines if the relationship you think you are seeing is possibly just do to chance

# Chi Square – 3 Steps



- First – you calculate “expected frequencies” for each cell in your contingency table – what would be there if there was “no” relationship
- Second – you calculate the difference between these expected frequencies and the actual frequencies – this is Chi Square
- Third – you look up the value in a table to determine the degree of confidence that a relationship exists

# Chi-Square Example – Step By Step



- A disgruntled official working in the personnel department of a large federal bureaucracy is disturbed by the level of incompetence she perceives in the leadership of the organization.
- She is convinced that incompetence rises to the top
- She shares this thought with a coworker who challenges her to substantiate her claim



# Chi-Square Example – Step By Step



- So, ignoring all personnel law, she selects a random sample of 400 people employed by the organization
- Using their civil service exams, she classifies them into three levels of competence (low, medium, high)
- Using their job descriptions, she classifies them into three levels of hierarchical position (low, medium, high)

# Chi-Square Example – Step By Step



## Cross-Tabulation of Competence and Hierarchy

### Competence

<b>Hierarchy</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>	<b>Total</b>
<b>Low</b>	<b>113</b>	<b>60</b>	<b>27</b>	<b>200</b>
<b>Medium</b>	<b>31</b>	<b>91</b>	<b>38</b>	<b>160</b>
<b>High</b>	<b>8</b>	<b>8</b>	<b>24</b>	<b>40</b>
<b>Total</b>	<b>152</b>	<b>159</b>	<b>89</b>	<b>400</b>

# Chi-Square : Step 1



- Compute the expected frequencies for each cell assuming no relationship between the independent and dependent variables (need to be working with actual frequencies, not percentages)
- For no relationship, we would expect there to be identical distributions of the dependent variable for each value of the independent variable
- For each level of “Competence” (low, medium, high), the distribution of hierarchy (low, medium, high) should be the same

# No Relationship would look like this



<b>Hypothetical No-Relationship Cross-Tabulation for Chi-Square</b>				
	<b>Competence</b>			
<b>Hierarchy</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>	<b>Total</b>
<b>Low</b>	50%	50%	50%	50% (n=200)
<b>Medium</b>	40%	40%	40%	40% (n=160)
<b>High</b>	10%	10%	10%	10% (n=40)

The proportion for each value of the Hierarchy would be the same for each Level of Competence (e.g. if the total proportion of “low in the hierarchy” is 50%, then it would be 50% for each value of competence)

# Chi-Square : Step 1



- Calculating the expected frequencies is cumbersome but easy
- Multiply the total proportional percentage of a value of the dependent variable (e.g. low in the hierarchy is 50%) by the total for each value of the independent variable (e.g. 152 for low competence)

**Cross-Tabulation of Competence and Hierarchy**

<b>Hierarchy</b>	<b>Competence</b>			<b>Total</b>
	<b>Low</b>	<b>Med</b>	<b>High</b>	
<b>Low</b>	$.50 \times 152 =$ 76.0			<b>200</b> <b>(50%)</b>
<b>Medium</b>				<b>160</b> <b>(40%)</b>
<b>High</b>				<b>40</b> <b>(10%)</b>
<b>Total</b>	<b>152</b>	<b>159</b>	<b>189</b>	<b>400</b> <b>(100%)</b>

# Chi-Square : Step 1



## Calculations for Expected Frequencies

### Table Cell

Competence	Hierarchy	Observed	Expected
Low	Low	113	$.50 \times 152 = 76.0$
Low	Medium	31	$.40 \times 152 = 60.8$
Low	High	8	$.10 \times 152 = 15.2$
Medium	Low	60	$.50 \times 159 = 79.5$
Medium	Medium	91	$.40 \times 159 = 63.6$
Medium	High	8	$.10 \times 159 = 15.9$
High	Low	27	$.50 \times 89 = 44.5$
High	Medium	38	$.40 \times 89 = 35.6$
High	High	24	$.10 \times 89 = 8.9$
	Total	400	400

# Chi-Square : Step 2



- Compute the value of Chi-Square
- Find out what the difference is between each observed frequency and what would be expected if no relationship
- Square that difference
- Divide that by the expected frequency
- Add them all up, and, *voila*, you've got chi-square!

# Chi-Square : Step 2



## Calculations for Expected Frequencies

Table Cell		Observed	Expected	(O-E) <sup>2</sup> /E
Competence	Hierarchy			
Low	Low	113	.50x152=76.0	18.01
Low	Medium	31	.40x152=60.8	14.61
Low	High	8	.10x152=15.2	3.41
Medium	Low	60	.50x159=79.5	4.78
Medium	Medium	91	.40x159=63.6	11.8
Medium	High	8	.10x159=15.9	3.93
High	Low	27	.50x89=44.5	6.88
High	Medium	38	.40x89=35.6	.16
High	High	24	.10x89=8.9	25.62
	Total	400	400	89.2

CHI-SQUARE!



# Chi-Square : Step 3



- Figure out the **degrees of freedom** and **statistical significance level**
  - Degrees of freedom: How big is your table? Multiply number of rows -1 by number of columns - 1; so,  $(3-1) \times (3-1) = 4$
  - Statistical significance level: probability your 'wrong' – chance you're willing to put up with (conventionally set at 5%)
- Look it up!
  - Back of any stats or methods book, Chi-Square distribution table (4 df down the side, .05 across the top)

# Chi-Square : Step 3



- What value do you get?
- If your chi-square value is higher than that, then you've found a relationship that is **statistically significant!**
- So, is there a relationship between Competence and Hierarchy?
- Is her hypothesis correct?
  - In class – percentage the table and evaluate

# Limitations of Chi-Square



- Chi-square helps you determine **if a relationship exists** (is statistically significant)
- Chi-square **does not** tell you **how strong** that relationship is or **which direction** that relationship takes (positive, negative, etc.)

# Assessing the Strength of a Relationship: Percentage Difference

- The easiest and most common method for assessing the strength and direction of a relationship is to simply use the percentage distribution!
- **Do this BEFORE trying any fancier statistics!**
- The closer you are to a perfect positive or negative relationship, the stronger the relationship!

Perfect Positive Relationship		
	Independent Variable	
Dependent Variable	Category 1	Category 2
Category 1	100%	0%
Category 2	0%	100%
	100%	100%

# In-Class Task



- Figure chi-square for this table as well as percentaging it
- Is there a statistically significant relationship there at the 5% level; what about the 10% level?
- Looking at the percentages, can you state the relationship in “directional” language?

Capital Punishment	Liberal	Conservative
Percent in Favor	25	52
Percent Opposed	37	43

# Measures of Association



- What if you can't really tell how strong the relationship is, or in what direction?
  - Like if you have a very large table?
- That's when you use “measures of association” – fancier stats
- Cramer's V, lambda, Gamma, Somer's d, and others
- They give you a number that you can tell the strength and direction (if ordinal or interval) of a relationship
- If stat made for Nominal data (e.g. Cramer's V), then the number will be between 0 and 1 (e.g. .49)
- If made for ordinal/interval, then will usually be between -1 and 1 to give both strength and direction.

# A Common Measure: Cramer's V



- While you will generally not run across many measures of association in your work, if you do, it will most likely be Cramer's V
- Non-directional between 0-1

# Statistical Control Table Analysis



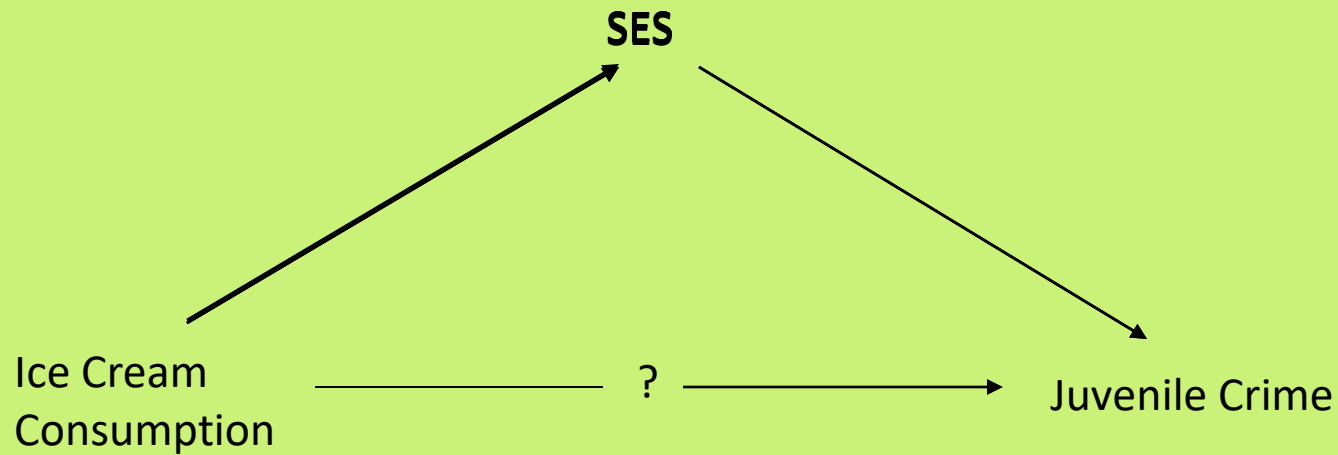
- According to this percentage distribution, does Ice Cream Consumption influence the rate of juvenile crime?
- What might be going on?

## Relationship between Juvenile Crime and Ice Cream Consumption

<b>Crime rate</b>	<b>Ice Cream Consumption</b>	
	<i>Low</i>	<i>High</i>
<i>Low</i>	25%	80%
<i>High</i>	75%	20%
<b>Total</b>	100%	100%
	(n = 20 precincts)	(n = 25 precincts)



# Controlling for a Third Variable



# Controlling for a Third Variable



- How we control for a third variable is deceptively simple
- You just examine the relationship between the original two variables **within each of the categories of the control variable**, then compare results across the categories of the control
- Sounds more difficult than it is

# Example: Alcoholism



- Handout

## In-Class Task

- General Halftrack suspects that Colonel Sy Verleaf is discriminating in his promotions by promoting more whites than non-whites. The table illustrates this hypothesis.

	Race		
Status	Non-white	White	Total
Passed Over	23	14	37
Promoted	27	86	113
Total	50	100	150

# In-Class Task



- When called in to explain, Colonel Verleaf presents the following tables in his defense

	Non-West Pointers' Race	
Status	Non-white	White
Passed Over	20	12
Promoted	19	12

	West Pointers' Race	
Status	Non-white	White
Passed Over	3	2
Promoted	8	74

	<b>Race</b>		
<b>Status</b>	<b>Non-white</b>	<b>White</b>	<b>Total</b>
<b>Passed Over</b>	<b>23</b>	<b>14</b>	<b>37</b>
<b>Promoted</b>	<b>27</b>	<b>86</b>	<b>113</b>
<b>Total</b>	<b>50</b>	<b>100</b>	<b>150</b>

	<b>Non-West Pointers' Race</b>	
<b>Status</b>	<b>Non-white</b>	<b>White</b>
<b>Passed Over</b>	<b>20</b>	<b>12</b>
<b>Promoted</b>	<b>19</b>	<b>12</b>

	<b>West Pointers' Race</b>	
<b>Status</b>	<b>Non-white</b>	<b>White</b>
<b>Passed Over</b>	<b>3</b>	<b>2</b>
<b>Promoted</b>	<b>8</b>	<b>74</b>

Percentage the Tables

What does the first table seem to show?

What variable is Colonel Verleaf trying to control for?

What would be your report to General Halftrack about Colonel Verleaf?

# Conducting mixed methods research: prior questions



- Is your research question one for which mixed methods would be the best approach?
- If so, which design would be the best?
- ***A mutual research design?*** involving acceptance that the two approaches come from completely different paradigms , celebrating their differences and keeping them separate within the design process – the ‘separate but together’ position?.
- ***Mixed methods?***
  - at which points will mixing occur? Design? Analysis? Interpretation?
  - What sampling approaches will you utilise from the probability and non-probability suite?
  - How are you going to manage data analysis?
  - *quantitizing* - converting qualitative data into quantitative data or *qualitizing* - converting quantitative data into qualitative data
  - To what degree will you qualitatively analyse quantitative data and vice versa?
  - How are you going to display your results? - Separately? Integrated? consolidated?

# Mixed method design

- Various forms of labeling and terminology have been used for mixed method design: *synergy, integration, triangulation, concurrent, parallel, merging, concurrent, sequential, exploratory and explanatory*. Concurrent or sequential are the 2 main options

## 1. Concurrent or parallel methods

- Here you would consider using multiple reference points where separate data sets are collected at the same time with the ultimate aim of merging the two data sets either,
  - in a visual display such as a matrix
  - by transforming the data (see quantitizing and qualitizing data in *crossover/mixed analyses* below) or
  - in the final discussion.

Design might involve using dual sites with the same sampling approach but with different data (quantitative and qualitative) then using the synthesised results to build up a complex picture.



## Design: 2. Sequential : explanatory/exploratory



- You could undertake a qualitative study to *explore* a particular issue or phenomenon and using an iterative approach you could create hypotheses from these results which you could test using a survey or experimental design.
- Or, you could develop a short questionnaire survey to elicit key issues which can then be *explained* in depth using qualitative approaches of interviewing and observation. Synthesis of the two sets of results is needed to clarify the dual outcomes and to utilise the increased validity these two approaches provide.

# A typical sequencing design



- *Stage 1:* Representative survey of the population
- *Stage 2:* Exploratory qualitative interviews or focus groups to tease out the findings of the survey
- *Stage 3:* Hypotheses generated from stages 1 and 2 are tested in various interventions which are then evaluated
- *Stage 4:* Participatory action research where the participants take control of the development, implementation and evaluation of the most successful of these interventions.

# Issues to consider in attempting to combine data sets



- You need to be familiar with both quantitative and qualitative approaches
- Mixing of paradigms, data collection, analysis and interpretation, takes time and skills to do well
- Combined designs are more expensive than single designs
- Are there benefits to converting qualitative to quantitative data?

# Crossover/mixed analysis

## Suggestions:

- reduce dimensionality of either data set (quantifying to basics)
- integrate data display (visual presentation of both sets as one)
- transform data (Qual to quantb(numerical codes) and quant to qual (themes) for analysis)
- correlate data (correlate results from quantizing and qualizing)
- consolidate data (merging multiple data sets to create new codes, variables etc)
- compare data (compare findings)
- integrate data (into one or two sets of data)
- use warranted assertion analysis (seeking meta-inferences from both sets)
- import data (using follow-up findings from qualitative to inform quantitative analysis and vice versa)

(adapted from Onwuegbuzie et al, 2010: 58-9).

# Presentation of dual results

## *Separate data sets*

- Requires a very large results section and requires regular summaries of data findings which will need to culminate in a final drawing together of the findings so that the reader can make sense of the diversity presented.

## *Combined data sets*

- Amalgamate the findings in such a way that a neat display of graphical information occurs, followed by a few carefully chosen qualitative quotes to display the homogeneity (or diversity) of the data gathered. Matrixes can bring together variables, themes and cases as can lists, network diagrams and graphical displays.

## *Multiple data sets*

- Currently the majority of data collected is still within the survey/interview/observation/document analysis framework with the documents traditionally being written communications displayed in a variety of creative ways.

# Using CAQDAS for qualitative analysis (2)



## **Checklist Box 13.17**

Complete the Checklist in Box 13.17  
to help you choose a CAQDAS package

Saunders *et al.* (2009)

# Conclusions / report writing:

## Qualitative Research

- Focus on:
  - Credibility
  - Dependability
  - Transferability
  - Confirmability

## Quantitative Research

- Focus on:
  - Internal validity
  - Reliability, stability
  - External validity
  - Objectivity

# Conclusions / report writing:

## Qualitative Research

- Conclusions based on understandings, insight
- Conclusions are subjective, speculative

## Quantitative Research

- Conclusions based on statistical analyses
- Conclusions stated in context of statistical degree of accuracy



# Conclusions / report writing:

## Qualitative Research

- Replications lead to tentative generalizations
- Predicated on the assumption that each individual, culture, setting is unique

## Quantitative Research

- Generalizations based on probabilities
- Assume “law” or “trends” may be identified

# QUALITATIVE (FIELD) RESEARCH



- IV. Data Analysis
- A. Computer assisted qualitative data analysis software (CAQDAS)
  - 1. Pros
    - a. efficiency in managing and organizing data
    - b. frees you from manual and clerical tasks
    - c. way to manage huge amounts of data
    - d. newest packages can analyze social media, YouTube videos, & web pages

# QUALITATIVE (FIELD) RESEARCH



- IV. Data Analysis
  - A. CAQDAS (con.)
    - 2. Cons
      - a. increasingly rigid and deterministic processes
      - b. increased pressure to focus on volume and breadth rather than depth and meaning (more quantitative bent)
      - c. time spent learning program rather than getting into & analyzing the data

# QUALITATIVE (FIELD) RESEARCH



- IV. Data Analysis
- A. CAQDAS (con.)
- 3. Examples
- a. Aquad (open source; windows)
- b. CAT (coding analysis kit; open source)
- c. Compendium (open source; windows; mac)
- d. HyperRESEARCH (proprietary; mac; windows)
- e. MAXQDA (proprietary; windows)
- f. NVivo (proprietary; windows)
-

# Qualitative Data Management Tools



- QSR NUD.IST

(Non-numerical unstructured data indexing searching and theorising)

- Enables efficient data management by supporting the processes of indexing, searching and hence data theorising
- Creates an environment to store and explore data and ideas, it does not determine the research approach.
- The major advantage of the package is that it enables an efficient and flexible approach to rigorously and systematically analysing qualitative data.

# Computerized data analysis



- In recent years software has been developed which can help with the analysis of qualitative data. Essentially they work on the principle of assist with the process of categorisation then collecting together items of information which appear to match under the given categories.
- The packages, if properly used, can save the researcher a great deal of time but a fair amount of human input is still required to identify and check categorisation.

# Computerized data analysis



They also require transcripts to be prepared on a computer and some novices, may not have access to the IT resources necessary for computer analysis.

- Some of the most well known software packages are listed below.
- ATLAS
- NVivo
- NUD\*IST
- Ethnograph

# Manual Data Analysis



- Burnard's fourteen stages of analysing interview transcripts (Burnard 1991).
- 
- Burnard's method is based on a synthesis between grounded and content analysis approach. This method was used to categorize and code the transcribed interview data.



# Computer Software



- Note that there are free demos of NVivo and XSight at:

[http://www.qsrinternational.com/products\\_free-trial-software.aspx](http://www.qsrinternational.com/products_free-trial-software.aspx)

# Conclusions / report writing:

## Qualitative Research

- Reports are longer, written in narrative form and published in the form of books or monographs
- Narrative descriptions

## Quantitative Research

- Reports are commonly reported in journals and only 5-15 pages in length
- Statistical descriptions

## **SUMMARY**

1. Although qualitative and quantitative data are different in nature, the analysis of both involves inference, systematic analysis and comparison. Both try to seek valid conclusions and avoid errors.
2. There are a number of ways of approaching qualitative analysis.
3. Analysing qualitative data should be an ongoing process throughout, as well as after the collection of data.

4. There are three key stages to qualitative data analysis: data reduction, data display and conclusion drawing/verification.

5. Data reduction takes place through the process of coding. Coding involves assigning units of meaning to data chunks, and can be open, axial or selective. These codes can then be displayed or organised to allow the drawing of conclusions.

# Summary: Chapter 13



- Qualitative data result from the collection of non-standardised data that require classification and are analysed through use of conceptualisation
- Qualitative analysis can involve summarising, categorising and structuring data
- The process of data analysis and collection are necessarily interactive

# Summary: Chapter 13



- Aids to analysis include interim summaries, self-memos and maintaining a researcher diary
- Qualitative analysis procedures can be related to using either a deductive or inductive approach
- Computer-assisted qualitative data analysis software (CAQDAS) can help with project management and data organisation

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