

Lecture Outline

Qualitative and quantitative data

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- Data and information
- Qualitative and Quantitative Data
- Data transformation
- Data interpretation

Data and Information

- Data represents information
 - facts that describe properties of something
 - represent reality
- Information is data that is used to
 - Solve a problem
 - Answer a question
 - Make a decision

Data and Information

- Data in isolation is meaningless
- Data in context is information
 - Context provides meaning to a recipient
- Data that informs is information
- “Making decisions without information, or without being informed is called guessing”
 - Briggs Library Research Guide, SDSU

Data and Information

- Data (facts) can be stored in a machine
 - Databases
 - Relational
 - Object
 - Data structures
 - Stacks
 - queues
 - Files
 - Flat files
 - XML

Data and Information

- Data can be interpreted to provide information
 - Transformation
 - Analysis
 - Transmission
 - Presentation

Qualitative and Quantitative Data

- Two general kinds of data
 - Qualitative
 - Quantitative
- Which kind of data a fact is depends on
 - What the data represents
 - How it represents it

Qualitative and Quantitative Data

- Qualitative data is word descriptions
 - Properties
 - Satisfaction
 - Mood
 - Categories
 - Member of staff
 - Affiliation
 - Can be inexact
 - Tall, thin, cold

Qualitative and Quantitative Data

- Quantitative data is numeric
 - Numbers
 - Values
 - Temperature Celsius
 - Weight in kilos
 - Height in metres
 - Exact(?)
 - $A < B$

Qualitative and Quantitative Data

- Some operations can be performed on qualitative data
 - Equality
- Some operations cannot
 - Depends on representation
 - Is blue < green?
 - Lexical order?

Data Transformation

- Qualitative data can be transformed into quantitative data
 - Green=1, Blue=2, Red=3
- Transformation must be performed with care
- Representation must be meaningful
 - Reflect reality
- Representation should allow analyses that reflect reality

Data Transformation

- What you can do with data is defined in theory
 - Measurement theory (lecture 10)
- Ensures that the numbers reflect reality
- Defines measurement scales
 - Ways of assigning numbers to symbols
- Scale determines what can be done with the data

Data Interpretation

- What is interpretation?
 - Giving data meaning?
 - Turning it into information?
 - Using it to construct a model of reality?

Data Interpretation

- Data analysis
 - Calculating statistics of quantitative data
 - Which statistics are appropriate?
 - Statistics of qualitative data?
 - Frequencies?

Data Interpretation

- Transmission of data
 - Getting data from A to B
 - Shannon's information theory
 - Compression
 - Lossy
 - Lossless
 - Which?

Data Interpretation

- Presentation of data
 - Visualisation
 - Accessibility
 - Clarity

Conclusion

- No agreed definitions of data and information
- Two kinds of data
 - Quantitative
 - Qualitative
- Quantitative is numbers
- Qualitative is not numbers
- Theory governs how data is transformed and interpreted