

Evaluation of social network sites - Methods for research projects to prepare a bachelor thesis

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Objective

Social networks are an important part of the society. Social network sites are influencing our society. Organisations and individuals can use social network sites for their advantage. This lecture gives an overview how to evaluate social network sites and to collect data in social network sites. Software is useful to research social network sites. This lecture present some software tools to students to research social network sites.

Research

Research is a systematic process of collecting, analyzing, and interpreting information – data – in order to increase our understanding of a phenomenon about which we are interested or concerned.

Good researches always begin a project with open minds about what they may – or may not – discover in their data.

There is no obvious end point – no point at which a researcher can say „Voila I´ve completely answered the question about which I´m concerned.“

Research

- ... originates with a question or problem.
- ... requires clear articulation of a goal
- ... usually divides the principal problem into more manageable sub problems
- Is guided by the specific plan for proceeding.
- Rests on certain critical assumptions.
- Requires the collection and interpretation of data in an attempt to resolve the problem that initiated the research.
- ... is, by its nature, cyclical or, more exactly, helical.

Hypothesis / Assumptions

A hypothesis is a logical supposition, a reasonable guess, an educated conjecture.

- Look for data that will support one of your hypotheses and enables to reject other.
- Hypotheses needs variables and explain dependencies
- If ... than

What is your assumption / hypotheses about social network sites?

- What would you like to know about social network sites?
 - Why would you like to explain social network sites?
-
- Practical outcome
 - Theoretical results

Methodology

- A research tool is a specific mechanism or strategy the researcher uses to collect, manipulate, or interpret data.
 - Literature Review – Library, Databases (Ebsco, Emerald ...)
 - Descriptive statistics summarize the general nature of the data obtained – What does the data indicate?
 - Use of Software like SPSS, R ...

The scientific method is a means whereby insight into the unknown is sought by researchers

1. Identifying a problem that defines the goal of one's quest
2. Positing a hypothesis that, if confirmed, resolves the problem
3. Gathering data relevant to the hypothesis
4. Analyzing and interpreting the data to see whether they support the hypothesis and resolve the question that initiated research

→ What is the goal of your research?

Theory

- If the theory is a viable explanation of the phenomenon under study
- Theories explain causal mechanism
- Theories help to predict the future

→ But theories do not explain anything and biases are expectable for a part of the society under consideration of the theory!

The problem – Heart of the research process

- The first step in the research process is to identify the problem with unwavering clarity and to state it in precise and unmistakable terms.
- The problem should lead to new knowledge
- The problem should lead to new useful results for the society
- Why – that is the question to explain the world and to find a situation

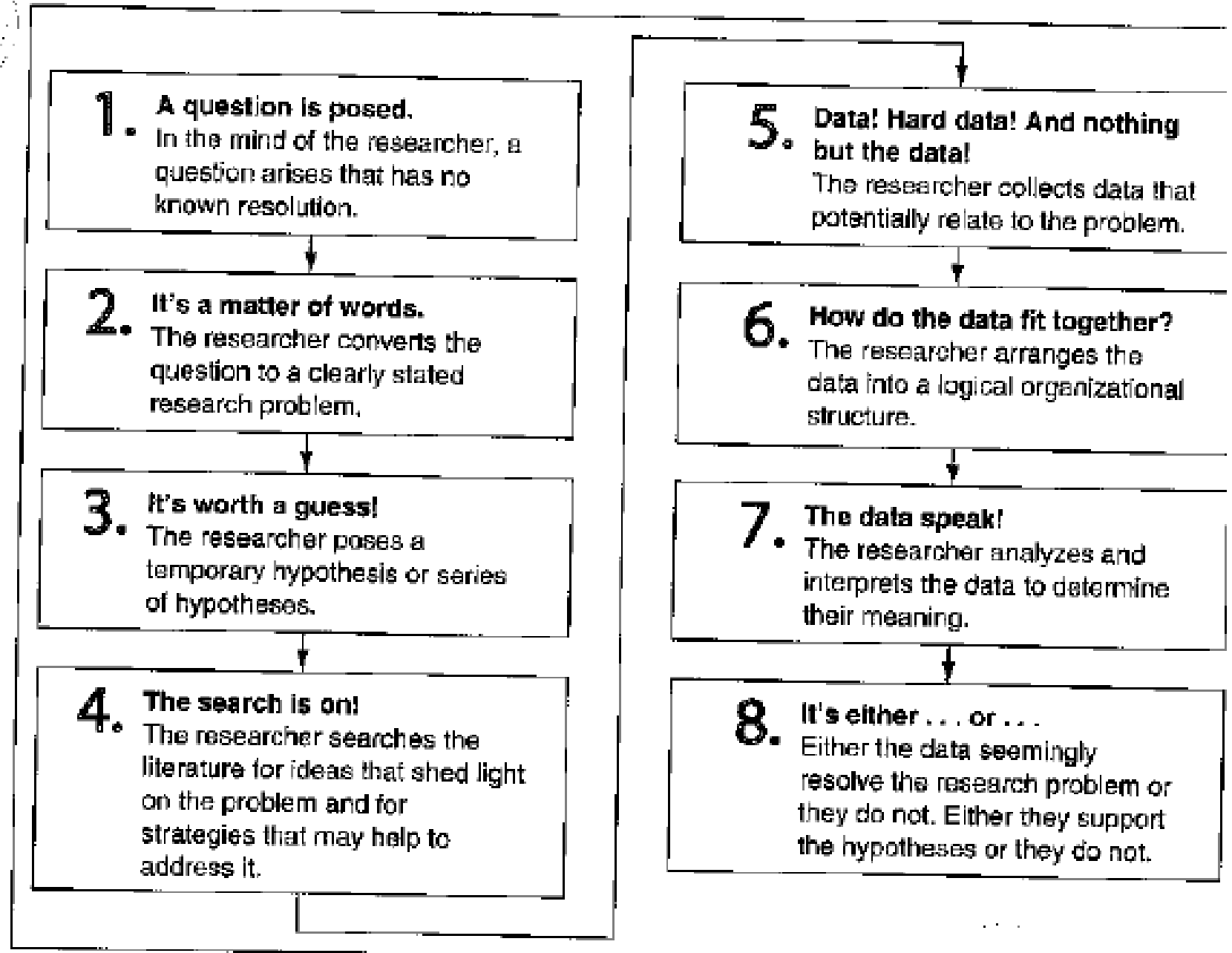
→ What is the practical / theoretical problem?

→ Why would be your research valuable?

Variable

- A variable is any quality of characteristics in research that investigation that has two or more possible values.
 - Directly manipulate-able variables are independent
 - A variable which is influenced by a variable is a dependent variable
 - Variables should be measurable to evaluate the hypothesis.
- What could be variables for social network sites research?

Data collection

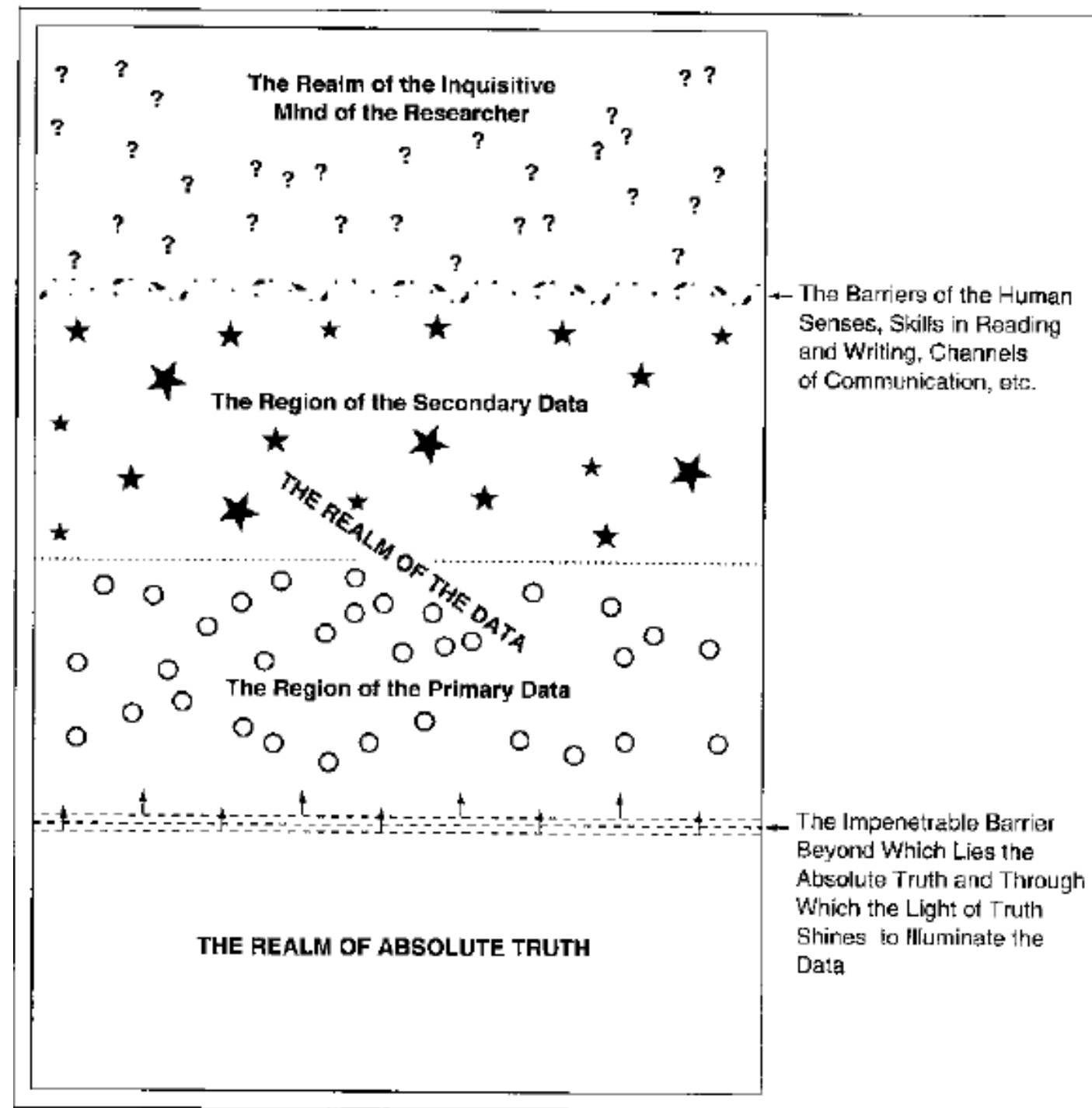


Data

- Access to data
- The data should be able to be measured in some ways
- Data are those pieces of information that any particulate situation gives to an observer
- Research seeks, through data to discover underlying truths

What data would be useful for your social network sites research?

Primary – secondary data



Leedy / Ormrod 2013

Planning for Data collection

- What data are needed?
- Where are the data located?
- How will the data be obtained?
- How will be the data interpreted?

→ Pin down your observation by measuring them in some ways

Defining Measuring

- Measurement is limiting the data of any phenomenon – substantial or insubstantial – so that those data may be interpreted and, ultimately, compared to a particular qualitative or quantitative standard.
- Measurement is ultimately a comparison - a thing or concept measured against a point of limitation.

Nominal scales

→ The scale does not have a value order or a measurable difference between the variables.

- Only a few statistical procedures are appropriate for analyzing nominal data
- Indicator for a frequency for example gender

Nominal scales for social network sites?

Ordinal scale

- With an ordinal scale of measurement, we can think in terms of the symbols $>$ (greater than) and $<$ (less than)
- Rank order of data

We can determine the extent of the relationship between two characteristics by means of Spearman's rank order correlation.

What kind of ordinal scale data exist for social network sites?

Interval Scales

- An interval scale of measurement is characterized by who features
 - It has equal units of measurement
 - Its zero point has been established arbitrarily
 - E.g. meter, Celsius

- Means, standard deviation, and Pearson product moment correlation can be used

Correlation

A correlation study examines the extent to which differences in one characteristic or variable are related to differences in one or more other characteristics or variables. A correlation exists if, when one variable increases, another variable either increases or decreases in a somewhat predictable fashion.

Conclusion Scale

- One object is different from another → nominal scale
- One object is bigger or better or more of anything than another → ordinal scale
- One object is so many units (degree, inches) more than another → interval scale

Quantitative and qualitative methods

- Quantitative research involves looking at amounts, or quantities or one or more variables of interest
- Qualitative research involves looking at characteristics, or qualities, that cannot be entirely reduced to numerical values

Quantitative research

Quantitative researchers often start with one or more specific hypotheses to be tested. They isolate the variable they want to study, use a standardized procedure to collect some form of numerical data, and use statistical procedures to analyze and draw conclusions from the data.

Example Questionnaire

- Survey research involves acquiring information about one or more groups of people – perhaps about their characteristics, opinions, attitudes, or previous experiences – by asking them questions and tabulating their answers.
 - The ultimate goal is to learn about a large population by surveying a sample of the population.
 - Anonymity
 - Likert scale – rating scale is useful when a behavior, attitude or other phenomena of interest needs to be evaluated
- Loosing valuable information because items are provided – questions are closed

Constructing your questionnaire

- Keep it short & simple
- Keep the respondents task simple and concrete
- Provide straightforward specific instructions
- Use simple unambiguous language
- Give a rationale for any items whose purpose may be unclear – each question should have a purpose
- Check for unwarranted assumptions implicit in your question
- Determine in advance how you will code the responses
- Check your consistency – answers are socially acceptable?
- Conduct one or more pilot tests to determine the validity of your questionnaire

Using Technology to facilitate Questionnaire

- Use e-mail to request participation and obtain participants' responses
- Databases
- Publications in communities, networks, forums → convenient sample

Maximize your return

- Consider the timing
- Make a good first impression
- Motivate potential respondents
- Offer the results of your study
- Be gently persistent

Qualitative research

Qualitative researchers often start with general research questions rather than specific hypotheses, collect an extensive amount of verbal data and (or nonverbal artifacts, organize those data and artifacts into some form that gives them coherence, and use verbal descriptions to portray the situation they have studied.

Qualitative research

The term qualitative research encompasses several approaches to research that are in some respects quite different from one another.

- little information exists on a topic
 - variables are unknown
 - relevant theory base is inadequate or missing
- A qualitative study can help define what is important – what needs to be studied

Qualitative research

Qualitative research gains increasing understanding of the phenomenon under investigation and so becomes increasingly able to ask more specific questions – an occasionally can formulate and test specific hypotheses as well

- Separate important information – identify the needed information
- Many unimportant details
- Subjective analysis / interpretation

Qualitative research for Social network sites

- Interviews
- Semantic analysis
- Observations
- Case studies – comparing different situations

Example quantitative / qualitative research - interviews

- Facts
- People's beliefs and perspectives about the facts
- Feelings
- Motives
- Present and past behaviors
- Reasons / explanations

People are apt to recall what might or should have happened (based on their attitudes, thoughts or beliefs) rather than what actually did happen.

Question	Quantitative	Qualitative
What is the purpose of the research?	<ul style="list-style-type: none"> ● To explain and predict ● To confirm and validate ● To test theory 	<ul style="list-style-type: none"> ● To describe and explain ● To explore and interpret ● To build theory
What is the nature of the research process?	<ul style="list-style-type: none"> ● Focused ● Known variables ● Established guidelines ● Predetermined methods ● Somewhat context-free ● Detached view 	<ul style="list-style-type: none"> ● Holistic ● Unknown variables ● Flexible guidelines ● Emergent methods ● Context-bound ● Personal view
What are the data like, and how are they collected?	<ul style="list-style-type: none"> ● Numeric data ● Representative, large sample ● Standardized instruments 	<ul style="list-style-type: none"> ● Textual and/or image-based data ● Informative, small sample ● Loosely structured or nonstandardized observations and interviews
How are data analyzed to determine their meaning?	<ul style="list-style-type: none"> ● Statistical analysis ● Stress on objectivity ● Deductive reasoning 	<ul style="list-style-type: none"> ● Search for themes and categories ● Acknowledgment that analysis is subjective and potentially biased ● Inductive reasoning
How are the findings communicated?	<ul style="list-style-type: none"> ● Numbers ● Statistics, aggregated data ● Formal voice, scientific style 	<ul style="list-style-type: none"> ● Words ● Narratives, individual quotes ● Personal voice, literary style (in some disciplines)

Use this approach if:	Quantitative	Qualitative
1. You believe that:	There is an objective reality that can be measured	There are multiple possible realities constructed by different individuals
2. Your audience is:	Familiar with/supportive of quantitative studies	Familiar with/supportive of qualitative studies
3. Your research question is:	Confirmatory, predictive	Exploratory, interpretive
4. The available literature is:	Relatively large	Limited
5. Your research focus:	Covers a lot of breadth	Involves in-depth study
6. Your time available is:	Relatively short	Relatively long
7. Your ability/desire to work with people is:	Medium to low	High
8. Your desire for structure is:	High	Low
9. You have skills in the areas of:	Deductive reasoning and statistics	Inductive reasoning and attention to detail
10. Your writing skills are strong in the areas of:	Technical, scientific writing	Literary, narrative writing

What kind of research ...

- Would you use quantitative or qualitative research for your scientific problem?
- Why would you use this kind of research?

Triangulation of research

- Multiple sources of data collected
- Mix of methods
- Deeper insight
- Support of the results
- More explanations

Validity & Reliability

- Validity of a measurement instrument is the extent to which the instrument measure what it is intended to measure.
- Reliability is the constancy with which a measuring instruments yields a certain, consistent result when the entity being measured hasn't changed.



Possible biases

- Validity errors reflect biases in the instruments itself
- Ratability errors reflect use of the instrument and are apt to vary unpredictably from one accession to the next

Sample

→ Results obtained from the sample to make generalization about the entire population only if the sample is truly representative of the population – nearly impossible for student work

In general the sample should be so carefully chosen that through it, the research is able to see characteristics of the total population in the sample proportion and relationship that they would be seen if the researcher were, in fact to examine the total population.

Probability Sampling

- In Probability sampling, every part of the population has the potential to be represented in the sample. The sample is chosen from the overall population by random selection.

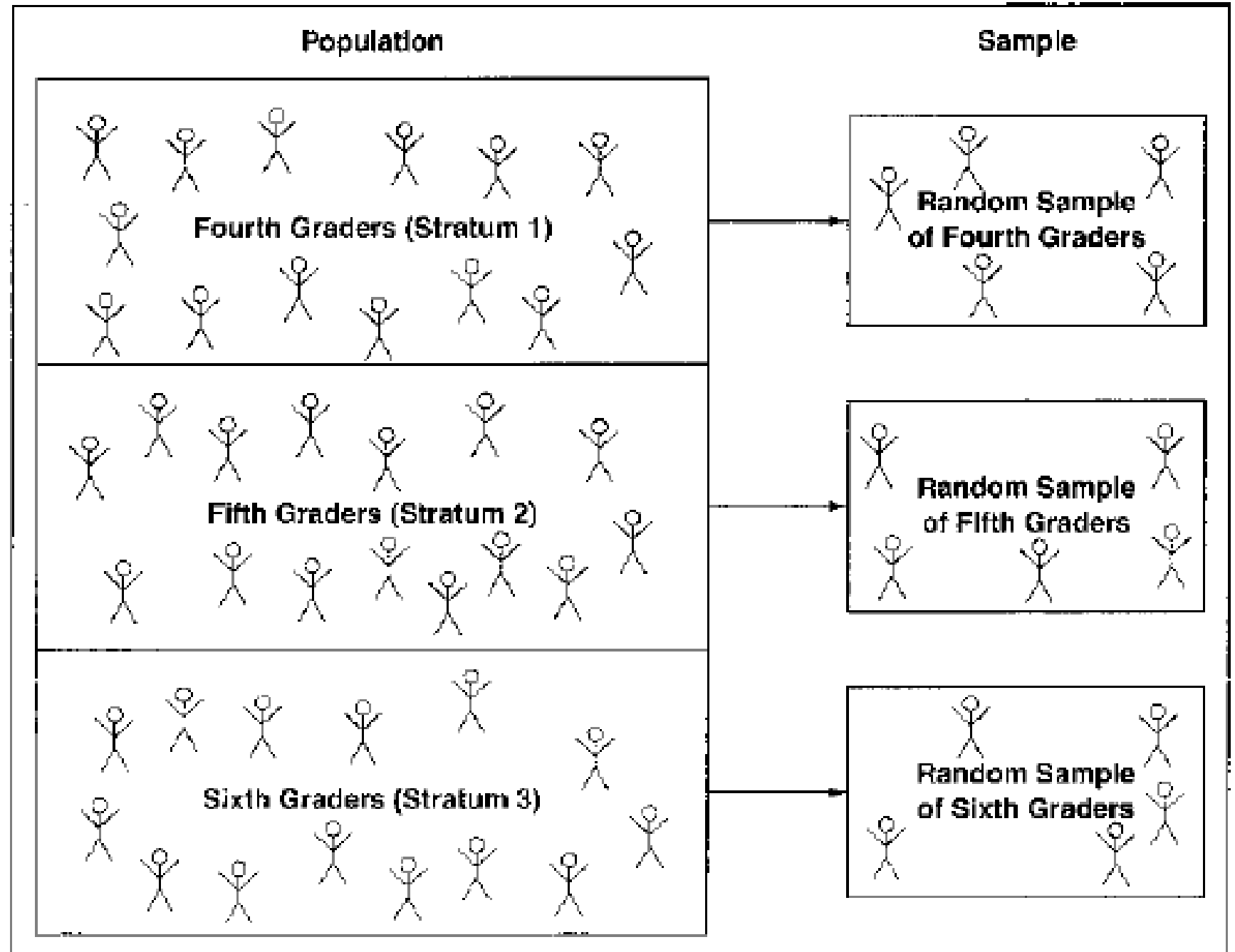
→ But nobody explains what means random selection? What means random.

? The purpose of randomness is to let blind chance determine the outcome of the selection process to as great as possible?

Simple random sampling

- Every member of the population has an equal chance of being selected
- Simple random sampling is neither practical nor, in many cases possible

Stratified random sampling



Nonprobability Sampling

- In nonprobability sampling, the researcher has no way of predicting or guaranteeing that each element of the population will be represented in the sample.
- Convenience sampling – also known as accidental sampling – makes no pretense of identifying a representative subset of a population. It takes people or other units that are readily available.
- Quota sampling is a variation of convenience sampling. It selects respondents in the same proportions that they are found in the general population, but not in a random fashion.

Identifying a sufficient sample size

→ Sample size depends on population!

- Population less than 100, survey the entire population
 - Population less than 500 and more than 100 survey 50%
 - Population over 500, survey 20%
 - Population above 5 000, survey more than 400 member of the population
- <http://www.raosoft.com/samplesize.html> for a first step but be careful and use more scientific sources!!!

Biases

- Nonprobability sampling has a disadvantage. People who happen to be readily available for a research project – those who are in the right place at the right time – are almost certainly not a random sample of the overall population.
 - When formulating conclusions about the data a researcher must be sure to consider the effect that bias may have had in distorting the data
- Researcher have to point out precisely how bias may have infiltrated the research design. With this knowledge, other scholars can realistically appraise the research and judge its merits.

Experiments

- Facebook provided to group A positive posts and to group B negative posts.
- Then Facebook evaluated the posts of group A and B to find out if the post content influence individuals – C has been control group.
- Negative posts have a negative influence
- Ethical question

Analyzing data

- Isolate the data
- How the research prepares the data for inspection will affect the meaning that those data reveal. Therefore every research should be able to provide a clear, logical rationale for the procedure used to arrange and organize data.

Analyzing data

Frequency, mean, median, correlation

What are needed to answer the research question and is useful for your research?

What kind of analyze tool describes your data, mechanism, explain your hypothesis?

<i>Measure of Central Tendency</i>	<i>How It Is Determined (N = number of scores)</i>	<i>Data for Which It Is Appropriate</i>
Mode	The most frequently occurring score is identified.	<ul style="list-style-type: none"> • Data on nominal, ordinal, interval, and ratio scales • Multimodal distributions (two or more modes may be identified when a distribution has multiple peaks)
Median	The scores are arranged in order from smallest to largest, and the middle score (when N is an odd number) or the midpoint between the two middle scores (when N is an even number) is identified.	<ul style="list-style-type: none"> • Data on ordinal, interval, and ratio scales • Data that are highly skewed
Arithmetic mean	All the scores are added together, and their sum is divided by the total number (N) of scores.	<ul style="list-style-type: none"> • Data on interval and ratio scales • Data that fall in a normal distribution.
Geometric Mean	All the scores are multiplied together, and the N th root of their product is computed.	<ul style="list-style-type: none"> • Data on ratio scales • Data that fall in an ogive curve (e.g., growth data)

Node XL

- www.nodexl.com
- <http://socialnetimporter.codeplex.com/downloads/get/1439747>

context

- <http://context.lis.illinois.edu/>

Thank you for your attention!

Questions? Comments?