Ice breaker #: When we ask you, “What is descriptive research?”, what comes to your mind??

REFERENCES

**DESCRIPTIVE RESEARCH**

**CSC 428: RESEARCH METHODS AND PRACTICE**
**PRESENTED BY: GALEB KIM AND ALICIA BOYD**
**THURSDAY, APRIL 27, 2017**

Ice breaker #1: When we ask you, “What is descriptive research?” what comes to your mind??

Thank You

**REFERENCES**
Ice breaker #1: When we ask you, “What is descriptive research?”, what comes to your mind??
WHAT IS DESCRIPTIVE RESEARCH?
Defining Descriptive Research

A type of research involves either identifying the characteristics of an observed phenomenon or exploring possible associations among two or more phenomena (Leedy & Ormrod, pg. 136)

A study designed to depict the participants in an accurate way (Kravitz, n.d)

Involves collecting information through data review, surveys, interviews or observation (Gay, 1987)
But Caution!!!

Some researchers may define Descriptive Research as qualitative only. But others may see Descriptive Research as quantitative as well.

Ice Breaker 2# Strong Inference Article
Descriptive Research: Qualitative VS. Quantitative

Qualitative Research Example: Jane Goodall, observed chimpanzees in the wild

Quantitative Research Example: Charles Keeling, measured CO2 concentrations in the atmosphere
JANE GOODALL
Atmospheric CO₂ at Mauna Loa Observatory

Scripps Institution of Oceanography
NOAA Earth System Research Laboratory

PARTS PER MILLION

YEAR


KEELING CURVE
Carbon Dioxide Variations

The Industrial Revolution Has Caused A Dramatic Rise in CO₂

CO₂ Concentration (ppmv)

Thousands of Years Ago

Ice Age Cycles
Role of Description Research in Four Step of Scientific Research

- Observation/Testing
- Reject/Accept Hypothesis(es)
- Testing/Observation
- Hypothesis(es)
Four Steps of Scientific Research

1. Observation / Testing
2. Hypothesis(es)
3. Testing / Observation
4. Reject/Accept Hypothesis(es)
Role of Description Research in Four Step of Scientific Research

1. Observation / Testing
2. Testing / Observation
3. Reject/Accept Hypothesis(es)
4. Hypothesis(es)
Four Steps of Scientific Research

1. Hypothesis(es)
2. Testing/Observation
3. Reject/Accept Hypothesis(es)
4. Observation/Testing

Prezi
Four Steps of Scientific Research

1. Observation
2. Hypothesis(es)
3. Testing
4. Reject/Accept Hypothesis(es)

Observation / Testing
Hypothesis(es)
Testing / Observation
Descriptive Research on Henry Mountain

Grove Karl Gilbert
Descriptive Research on Henry Mountain

Grove Karl Gilbert
Descriptive vs Experimental Research

Descriptive Research refers to research that describes a phenomenon or else a group under study.

Experimental Research refers to research where the researcher manipulates the variable to arrive at conclusions or else to come across findings.
3 CHARACTERISTICS OF DESCRIPTIVE RESEARCH AND EXPERIMENTAL RESEARCH:

1. Focus
2. Causation
3. Outcome
DESCRIPTIVE RESEARCH

Focus: describes the population through identifying the characteristics.

Causation: does not stress causality

Outcome: answers the question:
EXPERIMENTAL RESEARCH

Focus: Testing the hypothesis

Causation: Allows the researcher to find causality

Outcome: Answers the question
Planning for Data Collection in a Descriptive study

Substantial phenomena--have physical substance (e.g. Tape measure, balance scales)

Insubstantial phenomena--cannot be pinned down in terms of precise physical qualities (e.g. moving ratings, customer service)
FACILITATE QUANTIFICATION OF COMPLEX PHENOMENA
“It's an internet survey asking if there are too many internet surveys.”
COMPUTERIZING OBSERVATIONS

- Use a computer to automatically record what you see
- By the power of computing, we can access, collect, and clean massive data with minimal effort and cost
- Up-to date trend
  - recording/cleaning streaming data from sensors/computers/wearable devices
  - various forms of data from various sources
  Textual, image, qualitative data from user
  (e.g. smartphone app., Internet activity (chrome), SSN)
PLANNING AND CONDUCTING INTERVIEWS

THE POWER OF HANDOUTS
SELECTING A SAMPLE IN A DESCRIPTIVE STUDY

Probability Sampling
Probability Sampling

- Simple random sampling
- Stratified Random Sampling
- Proportional Stratified Sampling
- Cluster Sampling
- Systematic Sampling
NONPROBABILITY SAMPLING

- Convenience sampling
  - using student volunteers as subjects for research
- Quota sampling
  - interviewer selects specified sub-groups of population
- Purposive sampling
  - eg.: pollsters who forecast elections
Volunteers Needed

For a scientific study investigating whether people can distinguish between scientific studies and kidney-harvesting scams.

(Healthy type-0 adults only)

Take one.
SURVEYS OF VERY LARGE POPULATIONS

"DIVIDE AND CONQUER" (Multistage sampling)
- Building a representative sample
- Divide country into primary areas, randomly select areas to sample
- Divide the primary areas into sample locations, randomly select locations to sample
- Divide sample locations into chunks, randomly select chunks to sample
- Sufficient sample size depends on the

NOTES

- Convenience
- Using resources
IDENTIFYING A SUFFICIENT SAMPLE SIZE

Basic rule: The larger the sample, the better.
For smaller populations (N=100 or fewer), survey the entire population.
If population is around 500, sample 50%.
If population is around 1,500, sample 20%.

- G-Power 3 (see G* POWER 3.1 Manual; http://www.gpower.hhu.de/)
COMMON BIAS IN DESCRIPTIVE STUDIES

Bias = any influence, condition, or set of conditions that distort the data

- Sampling Bias
- Instrumentation Bias
- Response Bias
- Research Bias
**Sampling Bias**

- occurs when any factor(s) leads to a nonrepresentative sample of the population

- Examples:
  Selecting from phone book (e.g. Election Forecast)
  Using an online survey (excluding older gen.)
  Mailing questionnaires (low or selective response rate?)

- Question? Any example of sample bias? Maybe in Politics?
GERRYMANDERING!

Both parties
Share of popular
Share of US House seats

Modern Gerrymandering

Florida 5th

North Carolina 9th

Graphic by: Peter Bell
GERRYMANDERING
AS OF 2011!!

Both parties gerrymander

<table>
<thead>
<tr>
<th>Share of popular vote</th>
<th>Share of US House seats won</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARYLAND 2012</td>
<td>62%</td>
</tr>
<tr>
<td>PENNSYLVANIA 2012</td>
<td>49%</td>
</tr>
</tbody>
</table>

Modern Gerrymanders
These newly drawn congressional districts are among the most contorted in the nation. In some places, their appearances are not much wider than a highway.

(retrieved  
https://actrepresent.us/sign/gerrymandering)
Modern Gerrymanders

These newly drawn congressional districts are among the most contorted in the nation. In some places, their appendages are not much wider than a highway.

Graphic by: PETER BELL
Source: State redistricting offices

(retrieved from https://act.represent.us/sign/gerrymandering)
Both parties gerrymander

MARYLAND 2012
Share of popular vote: 62%
Share of US House seats won: 88%

PENNSYLVANIA 2012
Share of popular vote: 49%
Share of US House seats won: 73%

Modern Gerrymanders
These newly drawn congressional districts are among the most contorted in the nation. In some places, their appendages are not much wider than a highway.
IDENTIFYING SAMPLING BIAS

- Any factors that distinguish respondents from nonrespondents? (interests, education level, age, etc.)
- Compare responses
  (those returned quickly vs. those were returned later.)
- Randomly select a small number of nonrespondents and try to contact them.
- Benchmark the established sampling method of the associated field/research topic.
INSTRUMENTATION (MEASUREMENT) BIAS & RESPONSE BIAS

- **IB**: Measurement instruments slant the results questions lead to particular answers (e.g., poor instructions, wording, scales, response options)
- **RB**: Participants say what they think researcher wants to hear / participants want to create favorable impression
HOW TO MINIMIZE (QUALITATIVE) INSTRUMENTATION & RESPONSE BIASES

Guideline#1: Is any word ambiguous?
Guideline#2: Does the question state the necessary/appropriate frame of reference for answering?
Guideline#3: Does the question overemphasizes/exaggerates/dramatizes some condition?
Guideline#4: Is the question too general?
Guideline#5: Does the question overemphasizes/exaggerates/dramatizes some condition?
RESEARCHER BIAS

researchers are opinionated
researchers choose what they want to study
researchers make subjective interpretations
How to Minimize (Quantitative) Instrumentation Bias in the Use of Scientific Software

Designing the evaluation study

- Default parameters should be provided for the comparative context being investigated

- Do not implement your own version of an algorithm, particularly if one is available from the original authors.

- Perform comparisons on publicly available data

DOI: Neurosci., 09 September 2013 | https://doi.org/10.3389/fnins.2013.00162
How to Minimize (Quantitative) Instrumentation Bias in the Use of Scientific Software

Publishing the evaluation

- Include parameters
- Provide details as to the source of the algorithm
- Co-authors should verify findings
- Provide computational platform details of the evaluation
- Supply pre- and post-processing steps
- Post the resulting data online
- Put comparisons and observed performance differences into context
Defining Descriptive Research

A type of research involves either identifying the characteristics of an observed phenomenon or exploring possible associations among two or more phenomena. (Kelly, K. & Ormrod, J. E., 2008)

A study designed to depict the participants in an accurate way (burns & davis, 2008)

Involves collecting information through data (revised, surveys, interviews, or observation) (kelly, 2008)

Descriptive vs Experimental Research

Descriptive Research refers to research that describes a phenomenon in a group under study.

Experimental Research refers to research where the researcher manipulates the variable to evaluate the conditions or other factors across findings.

Planning for Data Collection in a Descriptive study

Observational phenomenon—have physical substance (e.g., case report, field notes)

Descriptive phenomenon—cannot be planned in terms of present physical quantity (e.g., making ratings, customer satisfaction)

SELECTING A SAMPLE IN A DESCRIPTIVE STUDY

Probability Sampling

- Simple random sampling
- Stratified random sampling
- Block random sampling
- Cluster random sampling
- Systematic random sampling

WHAT IS DESCRIPTIVE RESEARCH?
REFERENCES


QUESTIONS?
& DISCUSSION!
THANK YOU