Methodology

Steps in this tutorial

- 1) State the goals of this tutorial
- 2) What is a method section
- 3) What is in a method section
- 4) What is the procedure part of a method section
- 5) What goes in the procedure section
- 6) The specific elements of a procedure section
- 7) Detailed example of a procedure section

Goals of this tutorial

- Explain the purpose of a method section
- Demonstrate the procedure section of the method section

Objectives

- By the end of this tutorial you should be able to
  - Articulate what the method section of a psychology paper is
  - State what goes in that section
  - State the components of a procedure section
  - Draft a procedure section for your own work

What is a Method Section?

- It is the part of the proposal or research paper that describes the methods used to collect the data
- It follows the introduction
- It allows the reader to understand how the data were collected, and to judge for herself if she thinks the methods were good
- It should be detailed enough for a good researcher to be able to replicate the study from reading the method section

What is the Method section?

- The method section contains several sections
  - Participants
    - Who was in the study
  - Procedure
    - What happened in the study
  - Measures/Materials
    - What measures were used—like surveys
    - Or what materials—like special lab equipement
  - Analysis section-not covered in these tutorials
    - Describes the statistical analysis

Participants

- Who was in the study?
- How many participants?
  - Sample size
- Any important characteristics?
  - Both men and women?
  - Race/Ethnicity?
  - Age group?
  - Number of variables
  - Number of records
  - etc.

Participants

Inclusion characteristics

- Studies must clearly state if participants had to have any characteristics or meet certain requirements
  - Must have a diagnosis
  - Must be a parent-child pair
  - Must be married
  - Must be of a certain income range
  - Must be African American

Exclusion characteristics

- Studies need to state clearly any exclusion characteristics or things that would mean that someone should not be in the study
  - Must not have a serious alcohol or drug problem

The Participants Section-Example

Participants

Participants were 239 (40 men and 199 women) undergraduates at a university in the Southeastern U.S. who completed a survey in exchange for credit toward a course requirement. Participants' median age was 21, and they described themselves as White (55.6%), Black (18.8%), Latino/a (10.4%), Multiracial (5.4%), Asian (4.6%), Arabic (1.3%), and Other (3.8%). Because we focused here on an identity (nerd) whose cross-cultural and cross-linguistic generalizability was unknown to us, we restricted eligibility to native English speakers. Participation in this study was on a voluntary basis. Compensation in the form of extra credit and course credit for academic coursework was provided for some participants enrolled in specific undergraduate college courses. Participants who failed the manipulation check (n = 22) were excluded in further analyses.

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Sample size?

Who were the participants?

Important Characteristics?

Inclusion Characteristics?

What compensation they received?

Exclusion characteristics?
How many participants you did not analyze and why?

Study Area

- Location detail
- Google Earth/Map
- GPS coordinates

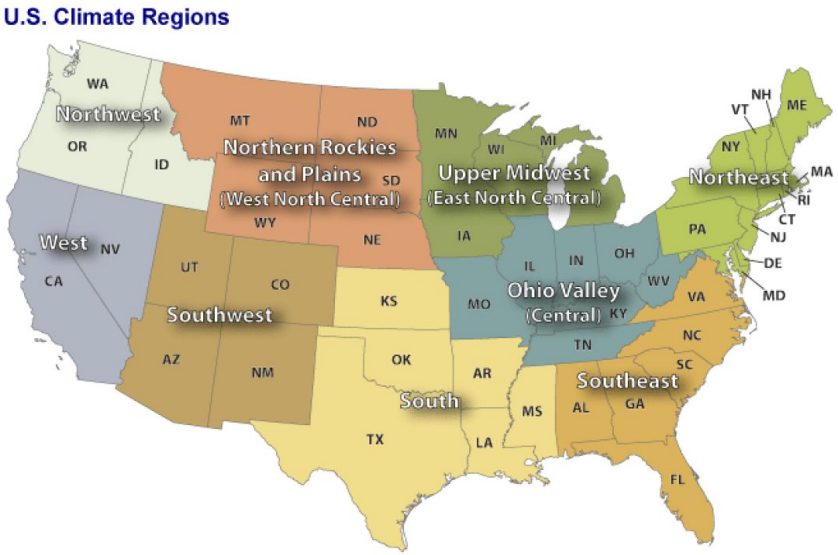
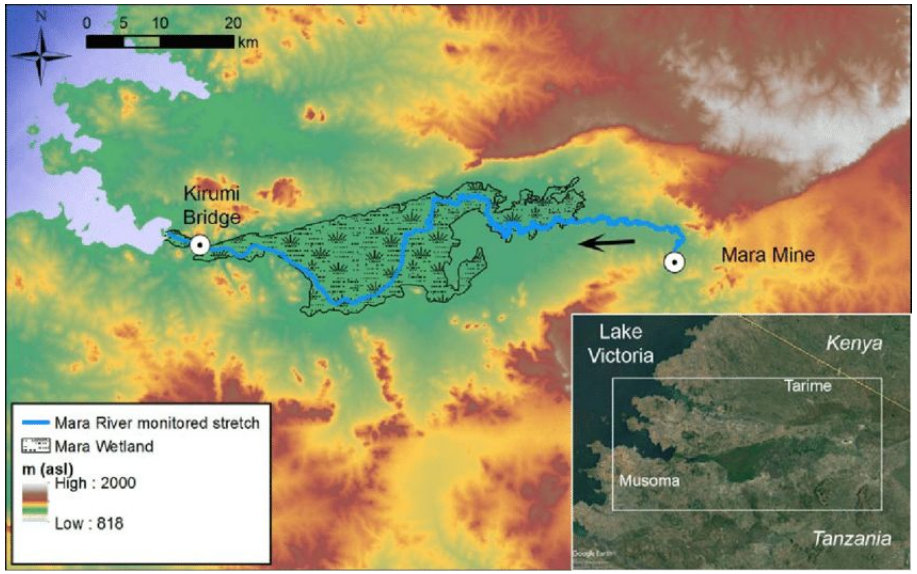


Figure 1:NOAA CLIMATE REGIONS



Materials

- All materials utilized for the study
  - Which ones were used? Why was it chosen?
  - testing instruments, books, images, database or other materials used in the course of research
- Measures (Surveys/Interviews/observations) used for the study
  - must provide details about the measures, scale, interpretation of scores
  - When using a pre-existing published measure: Include full name of measure followed by abbreviation and citation of original author
  - Ex: Occupational Stress Indicator (OSI; Cooper, 1997) After that, you can call it the OSI

Materials

- Drugs, Chemicals , Samples
  - Generic name, manufacturer, purity, concentration.
  - Eg. standards, dyes
- Culture Media, buffers
  - Components and their concentrations, pH etc.
  - Eg. Phosphate buffer pH 7
- Experimental Materials
  - Eg. Tissue, cell line etc.

Materials

- Animals/Plants/Bacteria
  - State the species, weight, strain, sex, and age etc.
  - Handling and care
  - Details of sedation: agent used, amount, route, administration (single, continuous) etc.

Procedures

- Sequences of procedures that make up an experiment (Tell a story)
- Arrange them in sub headings

Procedure

- Tells the reader how the data were collected
- Clearly shows the order in which things occurred
- States how the sample was recruited
- Notes who collected the data
- States clearly all processes or activities participants engaged in
- Says what happened in the study
- Notes where all the activities took place
- May include other important details

How the sample was recruited

- The participants section described what type of sample was used
  - E.g. a convenience sample or simple random sample
- The procedures section describes how the sample was actually recruited or contacted

How the sample was recruited

- How were they identified?
- Where were they recruited?
- What method, exactly, was used to recruit them?
  - For example, with fliers in local grocery stores asking interested volunteers to make contact by phone or email?
  - Using random digit dialing from a list of phone numbers from an entire zipcode?

How the sample was recruited-Example-Notes

- The exact number of community centers was noted
- The fact that the community centers served a specific population was described
- Who the flier was targeted at was described
  - Single parents of school aged children
- The wording of the flier was described

How the sample was recruited-Example 2-Notes

- This is for a stratified random sample
- The strata—male and female are described
- The method of random sampling—using a computerized random digit generator is described
- Who contacts them (a research assistant) is noted
- How contact is made (by phone) is noted

Who collected the data
Things to consider:

- Did others collect data, such as teachers, or parents?
- Did others collect data, like research assistants?
- Did people who collected data have special training or education?
- Did they have notable characteristics—that is, was it important that a person who collected the data was male or female or of a certain age, race or ethnicity?

Who collected data-Notes on the examples

- Note that in example one, two types of people collected data—social workers and research assistants.
- Note that in example one, the gender, race, and ethnicity characteristics of the social workers is mentioned, but not the research assistants.
  - Note also that this is not mentioned at all in example two.
  - This is because in one case the researcher believes it is important, and in the other cases the researcher did not believe it was important.

Where did activities take place

- Was data collected at a school?
- Did interviews happen at home, or at a place of the participants choosing?
- Was the place where data was collected private—so that a participant could feel secure in discussing confidential information?
- Was data collected in a lab, at a university or other institution?

What processes or activities participants engaged in

- How was consent obtained?
- Were participants interviewed or surveyed?
  - Individually or in groups? In person or by phone?
- Was there a treatment or therapy?
- Were materials read aloud, or did participants read to themselves?
- Did they take a test or view a film or slides?
- Were data collected from participants more than one time?
- How long did activities take?

Procedures section-Challenges?

- The most challenging task in a procedure section is to get the right level of detail
- Enough so that the reader has a clear sense of exactly what happened and how it happened
- But not so much that it is boring or overwhelming
- Procedures sections in published articles are likely to vary regarding level of detail

Experimental design

1. Independent variables
   - Variables manipulated (treatments)
2. Dependent variables
   - Variables measured
3. Control experiments or procedures
4. How many trials/replicates

Experimental Design Example

Design

The data were collected in four experimental conditions for 2 x 2 mixed-model ANOVA. Gender (male, female) was the between-subjects factor and Body type (thin, heavy) was the within-subjects factor. The rejection level for all analyses was set at p = 0.05.

Describes the experimental design, with factors, levels, and type of factor.

Data Analysis

- Simple test- Mean, standard deviation (SD), standard error of the mean (SEM)
- Statistical tests e.g. ANOVA, regression, descriptive statistics, t-tests, Chi square etc.
- Instrument e.g. HPLC analysis (solvent, method, flow rate, temperature, column etc)

Data Analysis Example

All qPCR and transfection data were subjected to one-way ANOVA, and differences between individual means were tested by a Tukey multiple-range test using Prism version 4.0 software (GraphPad). Tests of significance were performed using the appropriate error terms according to the expectation of the mean squares for error. A *P* value of 0.05 or less was considered significant. Data are presented as least-square means ± SEM.