



Analysis of Psychological Data

Lab 1. Stepping into the World of Statistics: Nuts and Bolts Terminologies

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Quantitative Methods, Measurement, and Statistics

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Welcome to PSY 010 lab sessions!

Are you ready?

**READY
FOR
PSY010!**





Who am I?

Background/Interests in

- Methodology and Statistics
- Psychology
- Bayesian inference



Trivia

- Traveled to 26 countries
- Served in the Air Force
- Fan of musicals & Marvel Studios
- Pineapples does not go on pizza





What are we going to do?

Breaking the ice: Dilemmas on Wednesday → Attendance check!

How to be successful in lab sessions

Recap to give you a big picture

Statistics, populations, and samples

Variables and scales of measurement

Food for thought



Dilemmas on Wednesday

Attendance check for lab 1

Please let me know your choice and reason for the following two dilemmas (any simple reason is enough!)

Send your responses to my email iheo2@ucmerced.edu by February 2, 7:29 am

Late submission is not accepted!

Curious about your choice!

When in-person, I will do the head-count before the lecture starts



Dilemmas on Wednesday

From Dilemmas op Dinsdag: Choose between the two options!

There is a chocolate river through your garden.



All the animals do everything you say.



OR





Dilemmas on Wednesday

How about this?

Every psychology course is taught at 9 am.



OR

Every psychology course focuses on statistics.





How to be successful

Purpose

Provide extra exposure to statistical concepts and exercises

What can you expect from me?

ANY HELP to be successful on this course :) Please check your mailbox for communication!

What can I expect from you?

(1) Active participation, (2) Ready to enjoy the world of statistics, and (3) Be kind to each other



Statistics, populations, and samples

Why do we do STATS?

To understand the characteristics of something with our data

Two ways of understanding

Descriptive statistics: Summarise and illustrate data we have

Inferential statistics: Infer characteristics from smaller data to larger data



Statistics, populations, and samples

Population

Entire set of cases

→ What we want to have & We use a *parameter* to describe population's characteristics
ex. Whole students at UC Merced

Sample

Subset of cases

→ What we usually have & We use a *statistic* to describe sample's characteristics
PSY 010 lab mates



Statistics, populations, and samples

Let's play with Pokemons

Population



Sample





Variables and scales of measurement

Variables

Any characteristic of something we are interested → Anything that can vary

Why do variables matter?

Statistical analysis plays with variables

Don't be confused with values of variables

Age is a variable where age itself can vary across different individuals
20 is one possible value of the variable age



Variables and scales of measurement

Types of variables

Quantitative vs. qualitative

Continuous vs. discrete



Variables and scales of measurement

Quantitative variable (= numerical variable)

Numbers represent magnitude

The number of people, age, temperature, height, weight

Qualitative variable (= categorical variable)

Focus is put on categories

Country of origin, result of coin toss



Variables and scales of measurement

Continuous variables

Variables have values on a full continuum of range

Age, height, weight, time

Discrete variables

Variables have values that are specific and separate

Number of people, ethnicity



Variables and scales of measurement

Think about the following:

What is the type of the variable GPA? Is it categorical or numerical?



Variables and scales of measurement

To be quantitative or qualitative, that's the problem

If measured on a letter grade (e.g., A, B, C), it is qualitative (i.e., categorical)

If measured on a numerical grade (e.g., 4.0, 3.2, 3.7), it is quantitative (i.e., numerical)

To fully define and understand a variable,
we need to know how that variable is **measured**.



Variables and scales of measurement

The measurement scale

Type of information provided by the values of a variable

Four scales of measurement

Nominal	Ordinal	Interval	Ratio
Named	Named Ordered	Named Ordered Equal interval	Named Ordered Equal interval True 0 value
<i>Gender</i>	<i>Letter grade (A~F)</i>	<i>Temperature</i>	<i>Height/Weight</i>
<i>Ethnicity</i>	<i>Political ideology</i>	<i>IQ Scores</i>	<i>Age</i>
<i>Color</i>	<i>Likert scale</i>	<i>SAT Scores</i>	<i>Income</i>



Food for thought

Can you tell me whether the following variables are...

Letter grade

Political affiliation

Time

Favorite TV Shows

Social Security Number

Salary

SAT Score

(1) Continuous or discrete?, (2) Quantitative or qualitative?, and (3) Scale of measurement?

Answers will be provided before the next lab session :)



Before you go home...

Lab materials are also available at

<https://github.com/lhnwhiHeo/PSY010>

Any questions or comments?

Office hours or my email



Thanks! Have a good one!

