



# STATISTIKA PENELITIAN

POPULASI, SAMPEL & PENGUJIAN HIPOTESIS

# TYPE of DATA



**All data (and hence the variables we measure) can be classified as one of two general types: quantitative data and qualitative data .**

**Quantitative data are data that are measured on a naturally occurring numerical scale. \***

**The following are examples of quantitative data:**

- The temperature (in degrees Celsius) at which each piece in a sample of 20 pieces of heat-resistant plastic begins to melt**



- **The current unemployment rate (measured as a percentage) in each of the 50 states**
- **The scores of a sample of 150 law school applicants on the LSAT, a standardized law school entrance exam administered nationwide**
- **The number of convicted murderers who receive the death penalty each year over a 10-year period**



**Quantitative data** are measurements that are recorded on a naturally occurring (alami) numerical scale.



In contrast, **qualitative data** cannot be measured on a natural numerical scale; they can only be classified into categories. \* (For this reason, this type of data is also called categorical data.) Examples of qualitative data include the following:

- The political party affiliation (Democrat, Republican, or Independent) in a sample of 50 voters
- The size of a car (subcompact, compact, midsize, or full size) rented by each of a sample of 30 business travelers
- A taste tester's ranking (best, worst, etc.)



**Qualitative (or categorical) data** are measurements that cannot be measured on a natural numerical scale; they can only be classified into one of a group of categories.



Once you decide on the type of data—quantitative or qualitative—appropriate for the problem at hand, you'll need to collect the data. Generally, you can obtain data in three different ways:

- From a published source
- From a designed experiment
- From an observational study (e.g., a survey)



Terlepas dari metode pengumpulan data mana yang digunakan, kemungkinan data itu akan menjadi sampel dari beberapa populasi. Dan jika kita ingin menerapkan statistik inferensial, kita harus mendapatkan **sampel yang representatif**





**A random sample** of  $n$  experimental units is a sample selected from the population in such a way that every different sample of size  $n$  has an equal chance of selection (kesempatan seleksi yang sama)



**Fundamental to the strategy of science is the formulation and testing of hypotheses about populations or the effects of experimental conditions on criterion variables.**

# TIPE HIPOTESIS



**Hypotheses** derived (diturunkan) from the researcher's theory about some social phenomenon are called **research hypotheses**.



**Null hypotheses** are, in a sense, the reverse of research hypotheses. They are also statements about the reality of things, except that they serve to **deny**.

# Levels of Measurement



## Nominal Scale

This is the lowest level of measurement and involves simply categorizing the variable to be measured into one of a number of discrete categories.

measuring “ethnic origin,” people may be categorized as American, Chinese, Australian, African, or Indian.



## Ordinal Scale

This level of measurement involves ordering or ranking the variable to be measured.

Example : .....

RANK: 1st place, 2nd place, ... last place

LEVEL OF AGREEMENT: No, Maybe, Yes

POLITICAL ORIENTATION: Left, Center, Right

Night	Dawn	Noon	Afternoon	Evening
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**Ordinal time of day** - indicates direction or order of occurrence; spacing between is uneven

## Interval Scale

This level of measurement involves being able to specify how far apart two stimuli are on a given dimension

Example:.....

TIME OF DAY on a 12-hour clock

POLITICAL ORIENTATION: Score on standardized scale of political orientation

OTHER scales constructed so as to possess equal intervals

12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

**Interval time of day** - equal intervals; analog (12-hr.) clock, difference between 1 and 2 pm is same as difference between 11 and 12 am



## Ratio Scale

This level of measurement replaces the arbitrary zero point of the interval scale with a true zero starting point that corresponds to the absence of the variable being measured.

Example :.....

RULER: inches or centimeters

INCOME: money earned last year

GPA: grade point average

YEARS of work experience

NUMBER of children

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

**Ratio** - 24-hr. time has an absolute 0 (midnight); 14 o'clock is twice as long from midnight as 7 o'clock



## Statistics **IN Action** Revisited

### Identifying the Population, Sample, and Inference

Consider the 2010 Pew Internet & American Life Project survey on social networking and cell phone use by teenagers. In particular, consider the survey results on social networking sites like Facebook or MySpace. The experimental unit for the study is a teenager (the person answering the question), and the variable measured is the response (“yes” or “no”) to the question.

The Pew Research Center reported that approximately 800 teens participated in the study. Obviously, that number is not all of the teenagers in the United States. Consequently, the 800 responses represent a sample selected from the much larger population of all American teenagers.

Earlier surveys found that 55% of American teenagers used an online social networking site in 2006, and 65%

in 2008. These are descriptive statistics that provide information on the popularity of social networking in past years. Since 73% of the surveyed teens in 2010 used an online social networking site, the Pew Research Center inferred that teens’ usage of social networking sites continues its upward trend, with more and more teens getting online each year. That is, the researchers used the descriptive statistics from the sample to make an inference about the current population of American teenagers’ use of social networking.



## Statistics IN ACTION Revisited

### Identifying the Data Collection Method and Data Type

In the Pew Internet & American Life Project report, American teenagers are asked to respond to a variety of questions about Internet, cell phone, and social networking site usage. According to the report, the data were obtained through phone interviews in the continental United States of 800 teenagers who were 12 to 17 years old at the time. Consequently, the data collection method is a survey (observational study).

Both quantitative and qualitative data were collected in the survey. For example, the survey question asking teens if they use social networking sites is phrased to elicit

a “yes” or “no” response. Since the responses produced for this question are categorical in nature, these data are qualitative. However, the question asking teens for the number of text messages they send and receive per day will give meaningful numerical responses, such as 5, 10, 12, etc. Thus, these data are quantitative.



# REFLEKSI



- 1. Informasi penting hari ini**
- 2. Manfaat penting dari informasi penting hari ini**
- 3. Tindak lanjut yang dapat saudara lakukan**





**Thank you!**  
**Any questions?**