

Section 3.3: Uses and Misuses of

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10:41 AM

Statistics

Statistical techniques can be used to

- describe a data set
- compare two or more different data sets
- determine if a relationship exists between variables
- test hypotheses (does acupuncture help patients with carpal tunnel?)
- make estimates about population characteristics based on samples
(we do this in Chapter 6)

but statistics can also be used to mislead!

things to look for:

① suspect samples

- does the sample actually represent the population?

(psychology studies mostly done

on undergraduate students at Western institutions)

- is it a convenience sample?

- what is the sample size?

if too small, results do not generalize well

② ambiguous averages

- are they using the mean or the median?

recall the mean is pulled toward the tail for skewed distributions
and is heavily influenced by outliers

③ using different scales/units

"the budget increased by \$200,000"

vs.

"the budget increased by 3%

is the \$200,000 large or small in comparison to the whole?

④ detached statistics

"our brand of device runs 100% faster"

faster than what? the older version?
the competition?

claims that don't specify what the
comparison is to can be suspect

⑤ implied connections

"eating fish **may** help to reduce your
cholesterol"

"studies **suggest** that ..."

"taking vitamin C will prevent colds
in **some** people"

note: this wording implies
connections between variables
that may not actually exist

⑥ misleading graphs

(we did this already)

⑦ faulty survey questions

- is the question loaded in some way

"should the province increase funding for higher education?"

vs.

"should the province raise your taxes to increase funding for higher education?"

- is the intent of the question difficult to figure out?

too wordy?

contain double negatives

example: explain briefly why the claims of the following studies might be suspect.

① since most automobile accidents occur within 29 km of a person's residence, it is safer to make longer trips

- most trips are within 29 km, so that's where you'd expect most accidents to occur

② it is estimated that in Seaside, there are 10 000 raccoons (totally made up number!). Clearly, Seaside has a raccoon

problem.

- is this the number we should expect? is this the number that other similar municipalities have?