Five important statistical concepts for journalists

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1. Key Ideas about Surveys

photo from http://pdphoto.org

The key to scientifically valid surveys is probability sampling

(the soup must be well-stirred)

photo from http://pdphoto.org

Essentially all scientific samples require a minimum sample size

(you need to taste a certain amount of well-stirred soup to know the soup flavor)

2. Other studies: Experiments vs. Observational Studies

A Beer Study

Everyone picked their favorite beer, took a free sample, then gave it a taste score.

Based on this study, it seems that all beers are equally well-liked, and everyone likes every beer!

Photo from http://thumbs.dreamstime.com/z/people-drinking-beer-bavarian-pub-16977405.jpg

3. Limits to Generalizability

Photo from www.cityfoodsters.com

“At our family reunion with 150 people, 80% of the sampled attendees wanted sushi for dinner”

“Therefore nearly everyone loves sushi”

4. (Lack of) Robustness: Can a few data points change the outcome?

Results of two important studies:

i) College students drink an average of 18 cans of Mountain Dew per week

ii) A recent study shows that hotter food is considered significantly better tasting

Study 1

The data:

0,0,0,0,0,0,0,0,

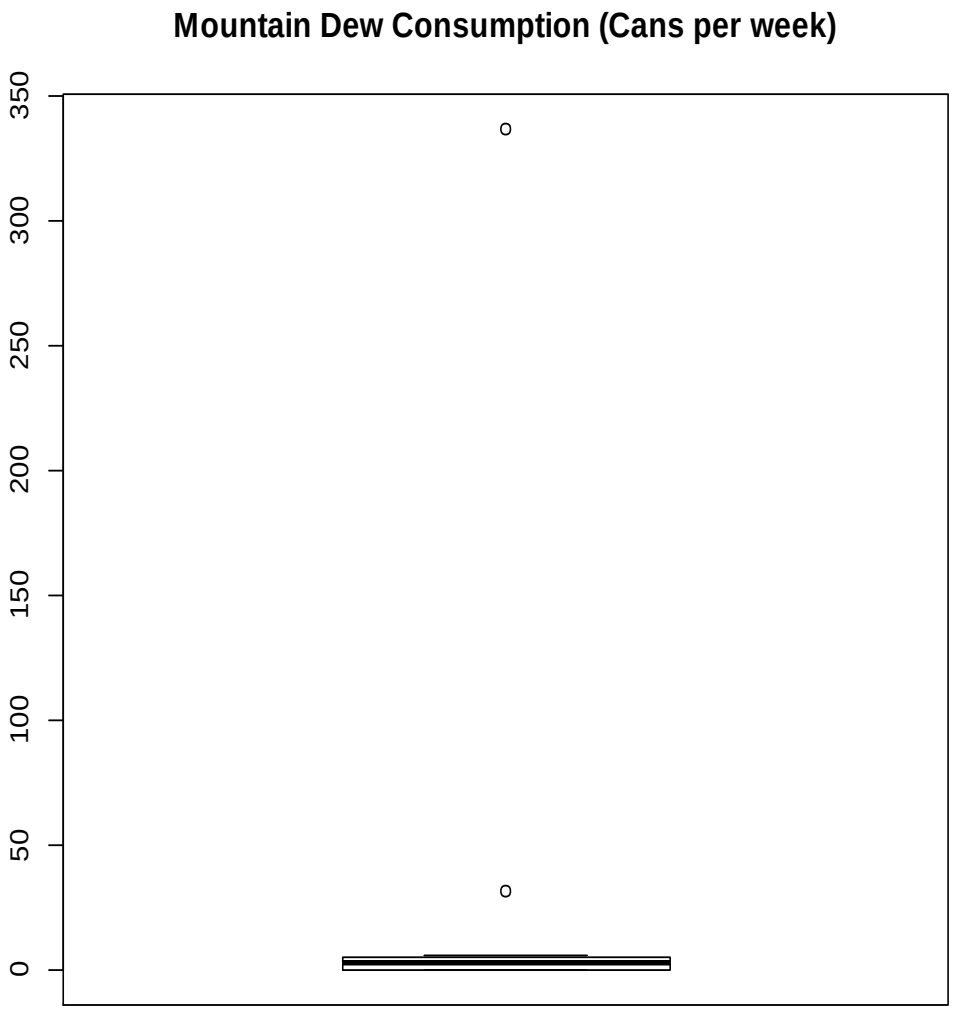
3,3,3,3,4,4,4,6,6,6,6,

1,1,32,337

Sample size = 23

The mean is 18.2

The median is 3.0



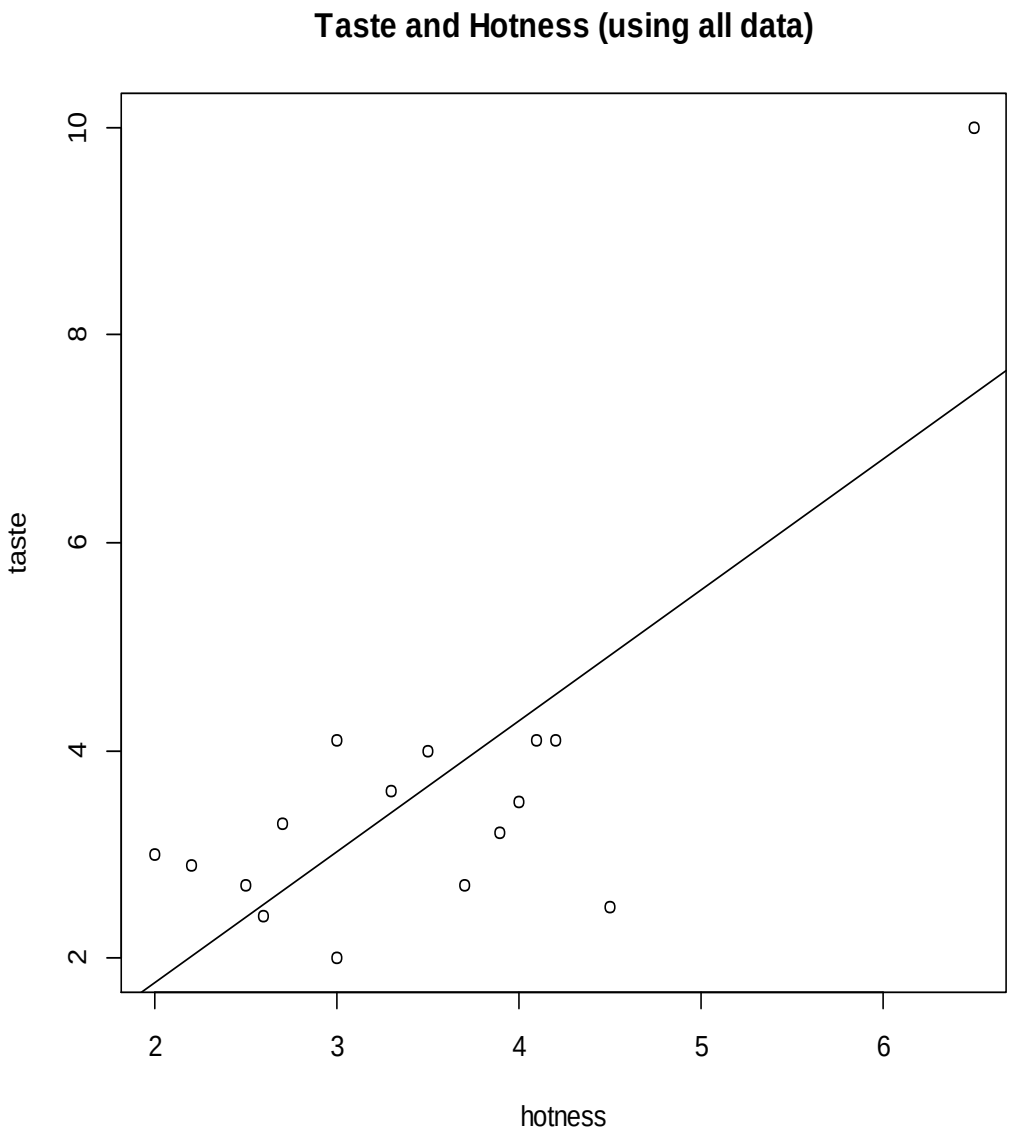
Study 2

Predicted taste =

-.75 + 1.26 * Hotness

The relationship is highly significant with

P < .001



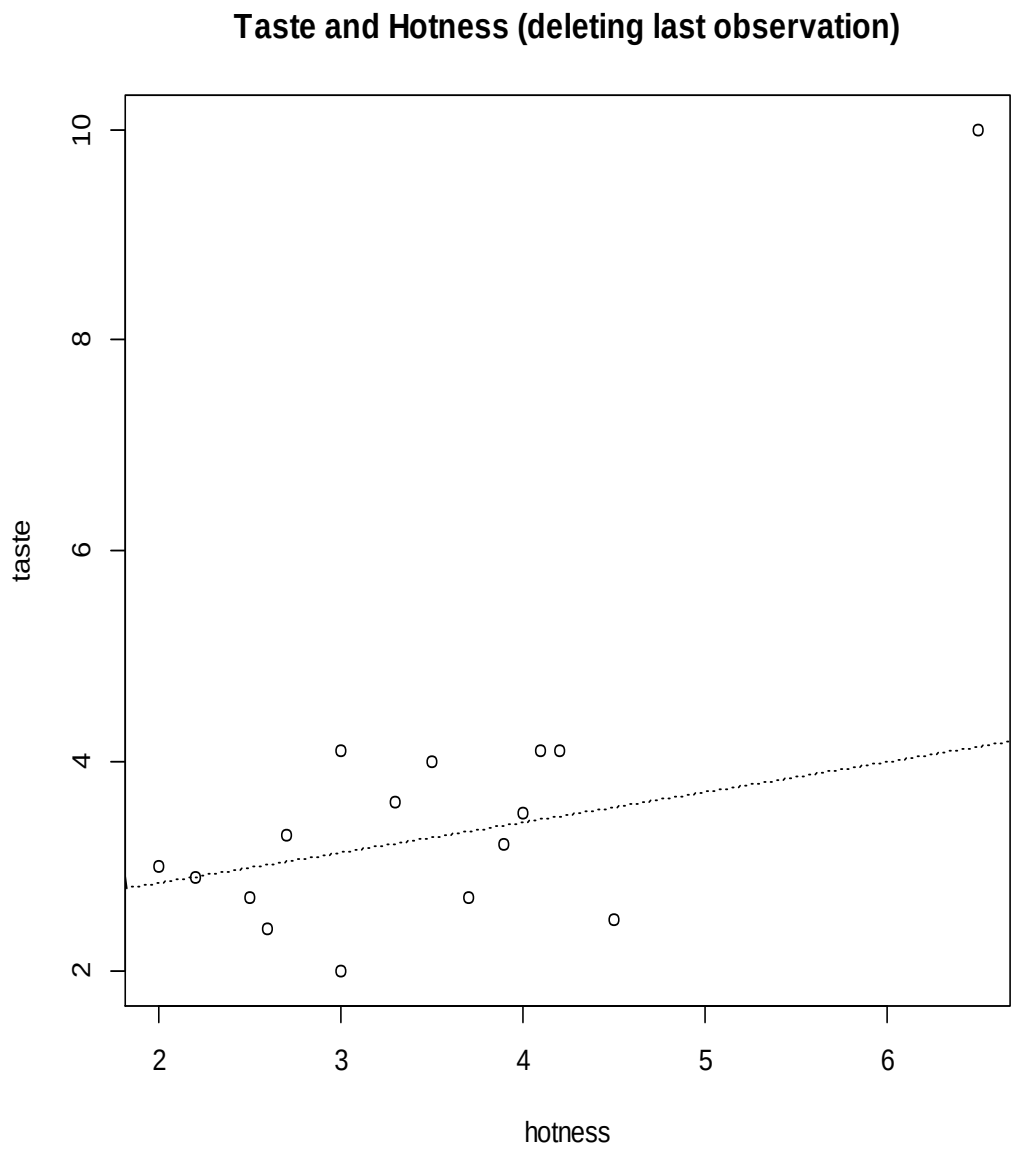
Study 2 again

Predicted taste =

2.26 + 0.29 * Hotness

The relationship is not significant with

P = .23



5. Are there always two sides to an issue?

Item 1

It is long been known that mushroom hunters must be careful to avoid toxic species.

Photo from http://www.fungiphoto.com , www.taylorlockwood.com

Item 1 continued

However, local outdoorsman Alfred E. Neuman disagrees:

“I have never tasted a mushroom that I did not like’” he says

Image from http://artsbeat.blogs.nytimes.com/2009/01/23/sad-news-for-mad-fans/

Item 2

Most people accept the advice given by nutrition researchers to limit their intake of sugary foods.

However, it is easy to find a large number of individuals who disagree with this prescription.

from http://www.thefitscoop.com/candy-reprimand-others/