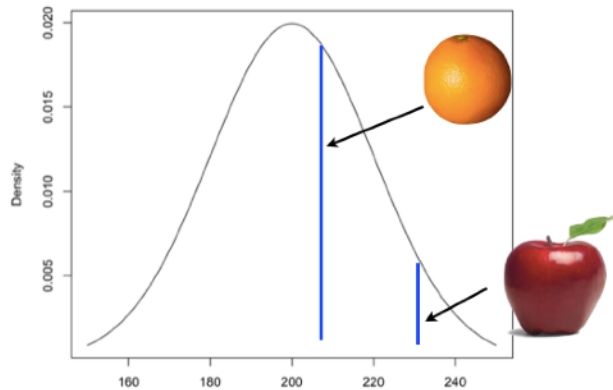


1

z-scores allow you to compare different variables. reflect distance from the mean in terms of # of standard deviations.

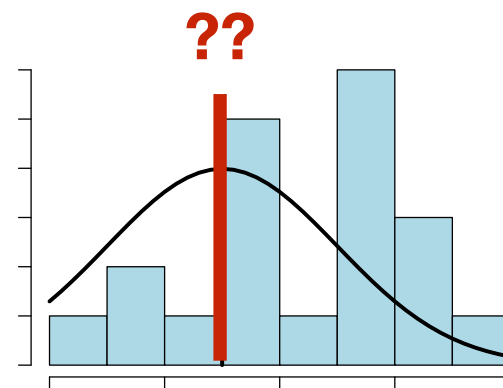
$$z = \frac{X - \mu}{\sigma}$$

z-score of +2 means it is two standard deviations above the mean



2

one-sample t-test: compares numerical data against a theoretically predicted mean



test statistic reflects the distance of your data from the mean

$$t = \frac{\bar{X} - \mu}{\hat{\sigma} / \sqrt{N}}$$

sampling distribution is a t-distribution with N-1 degrees of freedom



3

Two-sided one-sample t-test in R

`t.test (x=rawdata, mu=M)`

rawdata is the rawdata
N is the mean you're comparing it against

4

Cohen's d: measure of effect size

d	interp
0.2	small
0.5	medium
0.8	large

`cohensD(x=rawdata, mu=M)`

$$d = \frac{\text{"mean 1"} - \text{"mean 2"}}{\text{"std dev"}}$$

5

writing up: stats block

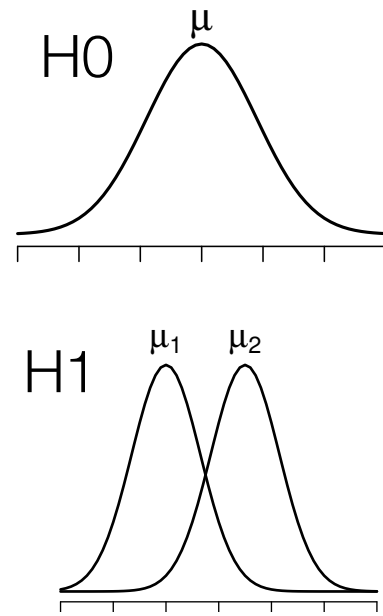
$t(19) = 3.42, p = .003$

df t-statistic p-value

6 independent samples t-test: compares two groups (two means)

Assumptions:

- normality
- independent sampling
- Student: groups have same standard deviation
- Welch: groups have different s.d.s



test statistic: t
sampling distribution: t, with $N1+N2-2$ degrees of freedom

Welch's t-test in R

long form: `t.test(outcome~predictor,dataset)`

wide form: `t.test(x=var1,y=var2)`

Student: add `var.equal=TRUE`

7 paired samples t-test: just like a one-sample t-test on the difference in means

wide form: `t.test(x=var1,y=var2,paired=TRUE)`

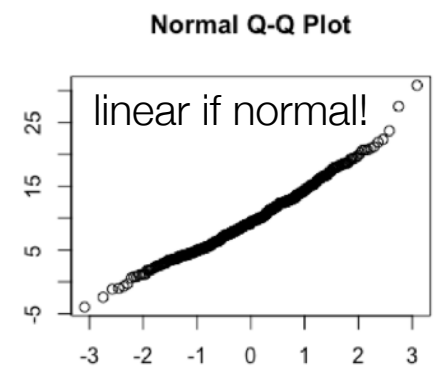
long form: `t.test(outcome~predictor,dataset,paired=TRUE)`

8 normality: Shapiro-Wilk test. if $p < 0.05$, not normal. but if sample size > 50 , may be significant even if normal. look at QQplot / histogram

`shapiro.test(var)`

Independent-samples: test each variable separately

paired-samples: test the difference variable



Wilcoxon: use if data is not normal. Compares data by “ranks” rather than actual values

`wilcox.test(outcome~predictor,dataset)`

Add `paired=TRUE` for paired-sample

Wilcoxon effect size: same interp as Cohens D

`library(rstatix)`
`wilcox.effsize(outcome~predictor,dataset)`

Add `paired=TRUE` for paired-sample