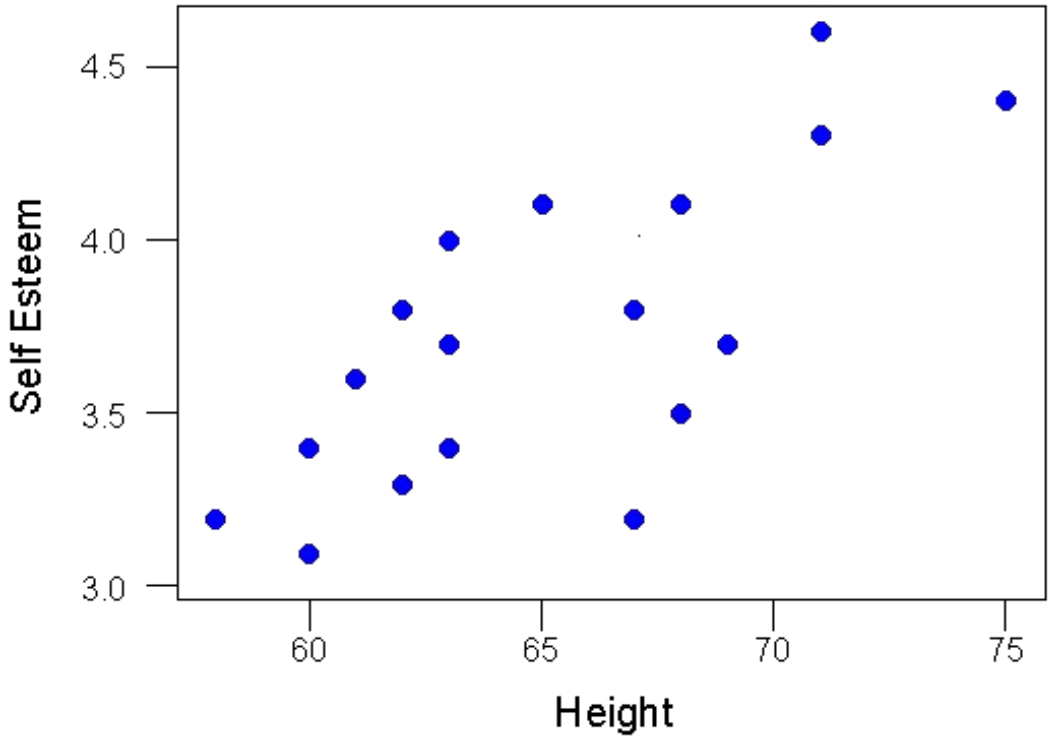
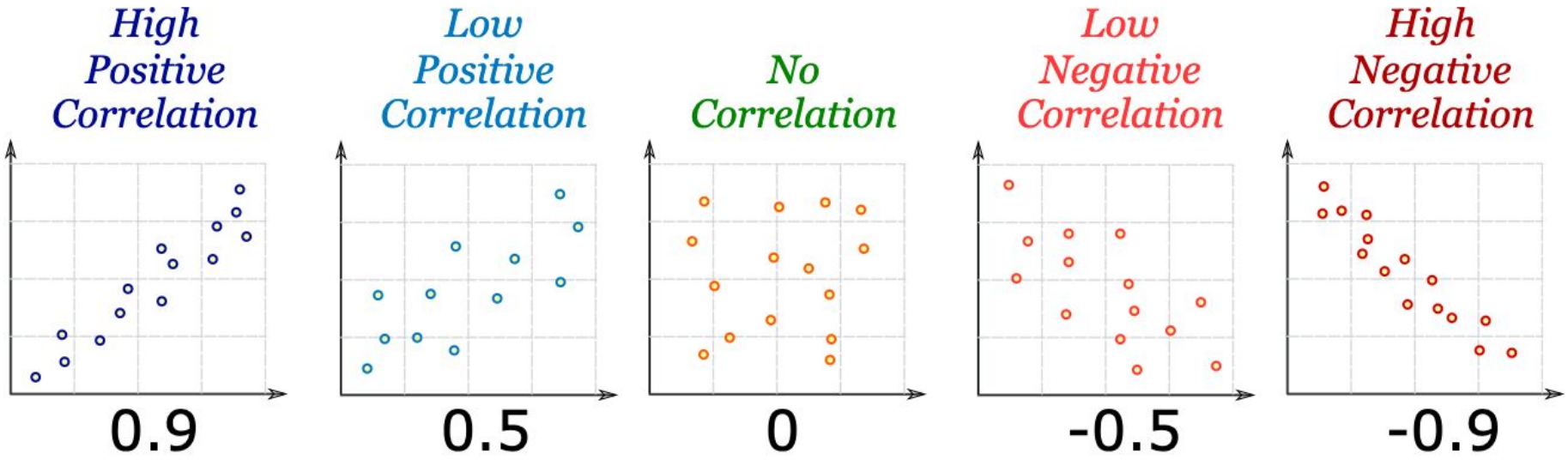
Correlation and p-values



Slides: Ben Cowley

We want some metric to quantify how much two variables go up and down together...



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  - terrible human being:
    - work was inspired by eugenics (create "improved" humans through genetic selectivity) and founded "Annals of Eugenics"
    - unfortunately, lots of statistical ideas arose from this field
    - morphed into "biometrics"

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- consider two variables, X and Y
- let μ_X be the mean of X and μ_Y be the mean of Y
- let σ_X^2 be the variance of X and σ_Y^2 be the variance of Y
- then correlation $\rho = \dfrac{\frac{1}{N}\sum_{i=1}^{N}(X_i - \mu_X)(Y_i - \mu_Y)}{\sqrt{\sigma_X^2 \sigma_Y^2}}$

GUESS THE CORRELATION

NEW GAME

TWO PLAYERS

SCORE BOARD

ABOUT

SETTINGS

Write a function that computes the correlation

input: X, Y (vectors)
output: *r* (correlation)

script1.py

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→ p-value: probability that *r_actual* is far from null distribution (*r_shuffs*)

Write a function that computes the correlation and p-value

input: X, Y (vectors)
output: *r* (correlation), p-value

script2.py