Linear Correlation

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Table of contents

1 Linear regression vs Pearson product vs Spearman rank coefficient

1.1 Linear Regression

Usually when the independent variable is fully controlled[1]

- 1 independent variable (x)
- 1 dependent variable (y)

Purpose: estimation of y-values from x-values

1.2 Pearson Product Moment Correlation (r)

Read more about Pearson Product Moment Correlation (r)

Generally applied when both variables are observed[1]

- 2 continuous random variables
- Purpose: Correlation Coefficient
  - Measure strength of the relationship
  - Conventionally applied when both

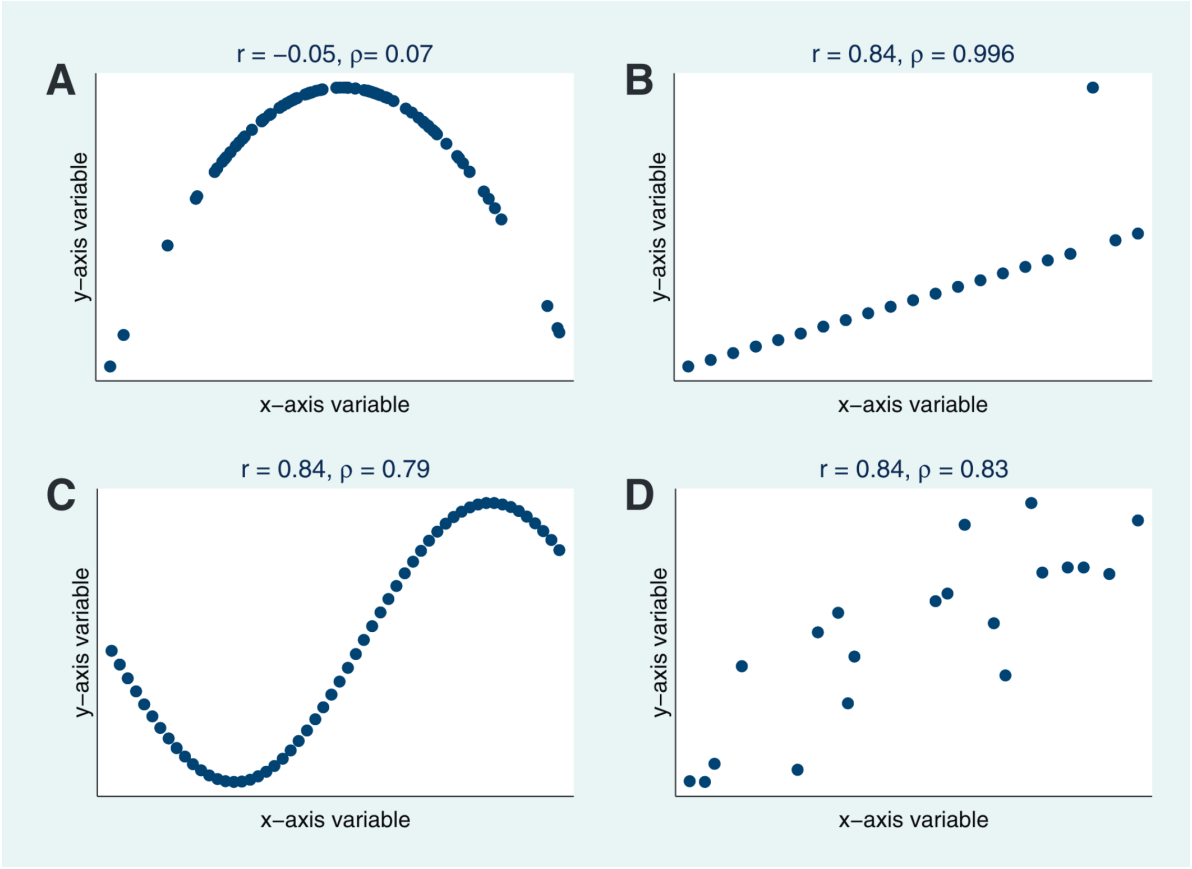

Figure 1: Comparison of differing "r" and "ρ" values (From figure 3 of Schober et al. 2018[1])

1.3 Spearman Rank Coefficient (ρ)

Read more about Spearman Rank Coefficient (ρ)

- 2 Continuous random variables
- 1 variable is ordinal and ranked
  - Converts non-linear to ranked-linear

Purpose: Correlation Coefficient

1. Schober P, Boer C, Schwarte LA. Correlation Coefficients: Appropriate Use and Interpretation. *Anesthesia and Analgesia*. 2018;126(5):1763-1768. doi:10.1213/ANE.0000000000002864