

Comparing coefficients: Standardization

Modeling Intensive Longitudinal Data

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Common reasons for people to do standardization

- ▶ ~~Standardizing normally distributed variables (make Z-scores) for Z hypothesis tests etc~~
- ▶ ~~Standardizing variables to deal with multicollinearity in models with interaction effects~~
- ▶ ~~Centering or standardizing variables to make models with interaction effects easier to interpret~~
- ▶ Standardizing variables to obtain standardized coefficients, which are used as effect sizes to compare the strength of regression associations

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- ▶ We center: We subtract the mean μ from each score in variable X . The mean of the centered variable is zero.
- ▶ We divide each score of the centered variable X by the standard deviation σ .
- ▶ The resulting standardized variable has a mean of zero and a standard deviation of 1.

Getting standardized regression coefficients

- ▶ Standardize predictor variables

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- ▶ Standardize dependent variables
- ▶ Run a regression analysis. The coefficients you get are standardized coefficients.

Why standardized coefficients

Interpretation unstandardized coefficients

How many measurement units the dependent variable increases, when the predictor variable increases one measurement unit.

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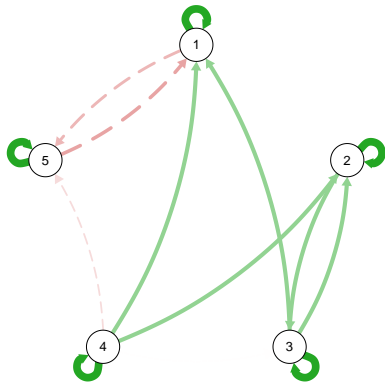
Interpretation standardized coefficients

Standardized coefficient: How many standard deviations the dependent variable increases, when the predictor variable increases one standard deviation.

- ▶ Unstandardized coefficients reflect the effects in terms of original measurement units directly.
- ▶ Standardized coefficients reflect the effects in terms of the variability of the variables.
- ▶ The latter is usually what we prefer for effect sizes (e.g., Cohen's d).

Why standardized coefficients

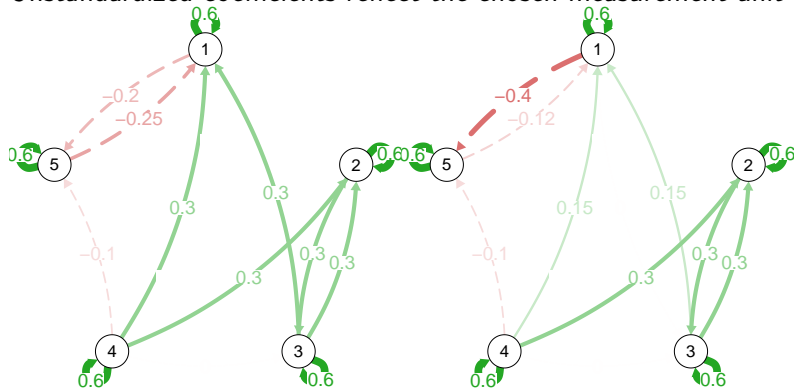
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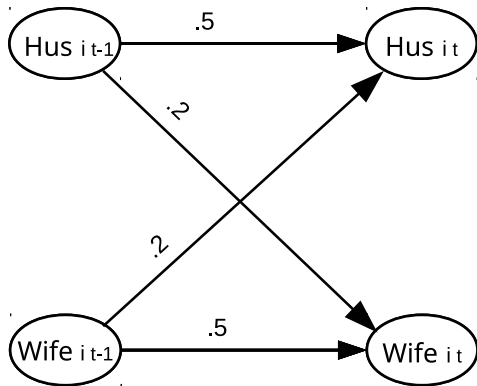
Right: All variables the same, but variable 1 "sleep quantity" is scaled hours of sleep (original scale $\times 2$).

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Note: If standardized coefficient A is larger than standardized coefficient B, the unique explained variance for A is bigger than for B.

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