Formeln

Videoserie Mehrebenenregression

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Video 2

1

$$\hat{y} = a + bx$$

2

$$\hat{y} = \beta_0 + \beta_1 x_1$$

3

$$\hat{y}_i = \beta_0 + \beta_1 x_{1i}$$

4

$$\hat{y}_i = \beta_0$$

5

$$\hat{y}_{ij} = \beta_{0j}$$

$$y_{ij} = \beta_{0j} + r_{ij}$$

$$y_{ij} = \beta_{0j} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$s^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}$$

9 a

$$Anteil\ Varianz\ auf\ L2 = \frac{Varianz\ L2}{Gesamtvarianz}$$

9 b

$$\textit{Anteil Var. } L2 = \frac{\textit{Varianz } L2}{\textit{Gesamtvarianz}} = \frac{\textit{Gesamtvarianz} - \textit{Varianz } L1}{\textit{Gesamtvarianz}}$$

9 c

$$\textit{Anteil Var. } L2 = \frac{\textit{Varianz } L2}{\textit{Gesamtvarianz}} = \frac{5.67 - 4.28}{5.67} \approx 0.24$$

$$ICC = \rho = \frac{\sigma^2_{L2}}{\sigma^2_{L1} + \sigma^2_{L2}}$$

$$\hat{y}_{ij} = \beta_{0j}\ 1 + \beta_1 x_{ij}$$

Video 4

$$y_{ij} = \beta_{0j} + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \beta_4 x_{4ij} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$y_{ij} = \beta_{0j} + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \beta_4 x_{4ij} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

3

$$R^2_{L1} = 1 - \frac{s^2_{L1_{Modell}}}{s^2_{L1_{Nullmodell}}}$$

$$R^2_{L2} = 1 - \frac{s^2_{L2_{Modell}}}{s^2_{L2_{Nullmodell}}}$$

$$y_{ij} = \beta_{0j} + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \beta_4 x_{4ij} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + \gamma_{01j} + u_{0j}$$

Video 5

$$y_{ij} = \beta_{0j} + \beta_1 \; x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \beta_4 x_{4ij} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + \gamma_{01j} + u_{0j}$$

$$y_{ij} = \beta_{0j} + \beta_{1j}\, x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \beta_4 x_{4ij} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + \gamma_{01j} + u_{0j}$$

und jetzt zusätzlich

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$y_{ij} = \beta_{0j} + \beta_{1j}\, x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \beta_4 x_{4ij} + r_{ij}$$

mit

$$\beta_{0j} = \gamma_{00} + \gamma_{01j} + u_{0j}$$

und jetzt zusätzlich

$$\beta_{1j} = \gamma_{10} + \gamma_{11j} + u_{1j}$$