

Online Resource 1: Model Equations for Multilevel Analysis

Do autonomy, self-efficacy, vitality, and fatigue predict daily morning heart rate variability? A running intervention study in healthy women

Sport Sciences for Health

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Model equations H1-H5

On level 1 γ_{ij} is the outcome variable for individual i at time j . Beta coefficients represent the intercept (β_{0j}), the autoregressive effect (β_{1j}) and the effects of time (β_{2j}), type of day (β_{3j}), vitality (β_{4j}), fatigue (β_{5j}), Group (β_{6j}), VO_{2max} (β_{7j}), self-efficacy (β_{8j}), motivation (β_{9j}), and the co-variate heart period (β_{10j}). Residual variation is displayed by (ϵ_{ij}). On level 2 we included a random term (μ_{0j}) to model variation in intercepts (γ_{00}).

Effects on daily morning vmHRV

Level 1:

$$\begin{aligned}\gamma(\text{RMSSDlog}(t))_{ij} = & \beta_{0j} + \beta_{1j}(\text{RMSSDlog}(t-1))_{ij} + \beta_{2j}(\text{time})_{ij} + \beta_{3j}(\text{type of day}(t))_{ij} + \beta_{4j}(\text{vitality})_{ij} \\ & + \beta_{5j}(\text{fatigue})_{ij} + \beta_{6j}(\text{Group})_{ij} + \beta_{7j}(\text{VO2max})_{ij} + \beta_{8j}(\text{self-efficacy})_{ij} + \beta_{9j}(\text{motivation})_{ij} + \epsilon_{ij}\end{aligned}$$

Level 2: $\beta_{0j} = \gamma_{00} + \mu_{0j}$

Effects on daily morning vmHRV controlled by heart period

Level 1:

$$\begin{aligned} \gamma(\text{RMSSDlog}(t))_{ij} = & \beta_{0j} + \beta_{1j}(\text{RMSSDlog}(t-1))_{ij} + \beta_{2j}(\text{time})_{ij} + \beta_{3j}(\text{type of day}(t))_{ij} + \beta_{4j}(\text{vitality})_{ij} \\ & + \beta_{5j}(\text{fatigue})_{ij} + \beta_{6j}(\text{Group})_{ij} + \beta_{7j}(\text{Vo2max})_{ij} + \beta_{8j}(\text{self-efficacy})_{ij} + \beta_{9j}(\text{motivation})_{ij} + \beta_{10j}(\text{RRlog})_{ij} + \varepsilon_{ij} \end{aligned}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

Effects on daily morning heart period

$$\begin{aligned} \text{Level 1: } \gamma(\text{RRlog}(t))_{ij} = & \beta_{0j} + \beta_{1j}(\text{RRlog}(t-1))_{ij} + \beta_{2j}(\text{time})_{ij} + \beta_{3j}(\text{type of day}(t))_{ij} + \beta_{4j}(\text{vitality})_{ij} \\ & + \beta_{5j}(\text{fatigue})_{ij} + \beta_{6j}(\text{Group})_{ij} + \beta_{7j}(\text{VO2max})_{ij} + \beta_{8j}(\text{self-efficacy})_{ij} + \beta_{9j}(\text{motivation})_{ij} + \varepsilon_{ij} \end{aligned}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$

Effects on daily morning vmHRV controlled by heart period

$$\begin{aligned} \text{Level 1: } \gamma(\text{RRlog}(t))_{ij} = & \beta_{0j} + \beta_{1j}(\text{RRlog}(t-1))_{ij} + \beta_{2j}(\text{time})_{ij} + \beta_{3j}(\text{type of day}(t))_{ij} + \beta_{4j}(\text{vitality})_{ij} \\ & + \beta_{5j}(\text{fatigue})_{ij} + \beta_{6j}(\text{Group})_{ij} + \beta_{7j}(\text{Vo2max})_{ij} + \beta_{8j}(\text{self-efficacy})_{ij} + \beta_{9j}(\text{motivation})_{ij} + \beta_{10j}(\text{RMSSDlog})_{ij} + \varepsilon_{ij} \end{aligned}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \mu_{0j}$$