SAS code for “Mixed-Effects Regression Models with Heterogeneous Variance: Analyzing Ecological Momentary Assessment (EMA) Data of Smoking”

Donald Hedeker & Robin Mermelstein


SAS syntax for models in TABLE 8.3 Here, SMKLEVEL is coded 0, 1, 2 for the three smoking history groups, and is used as a categorical variable in most of the syntax below. The variable SMKLEV is set equal to SMKLEVEL for use as a linear variable in Model Ib, i.e.,

\[
\text{SMKLEV} = \text{SMKLEVEL};
\]

For Model IIc, SMKLEVR is a reverse-coded version of SMKLEV, i.e.,

\[
\begin{align*}
\text{IF SMKLEV} = 0 & \text{ THEN SMKLEVR} = 2; \\
\text{IF SMKLEV} = 1 & \text{ THEN SMKLEVR} = 1; \\
\text{IF SMKLEV} = 2 & \text{ THEN SMKLEVR} = 0;
\end{align*}
\]

Model Ia
PROC MIXED METHOD=REML COVTEST;
    CLASS ID SMKLEVEL;
    MODEL CPHYS = SMKLEVEL /SOLUTION;
    RANDOM INTERCEPT /SUB=ID;

Model Ib
PROC MIXED METHOD=REML COVTEST;
    CLASS ID SMKLEVEL;
    MODEL CPHYS = SMKLEVEL /SOLUTION;
    RANDOM INTERCEPT /SUB=ID;
    REPEATED /SUB=ID LOCAL=EXP(SMKLEV);

Model IIc
PROC MIXED METHOD=REML COVTEST;
    CLASS ID SMKLEVEL;
    MODEL CPHYS = SMKLEVEL /SOLUTION;
    RANDOM INTERCEPT SMKLEVR /SUB=ID TYPE=VC;
    REPEATED /SUB=ID GROUP=SMKLEVEL;

Model IIIc
PROC MIXED METHOD=REML COVTEST;
    CLASS ID SMKLEVEL;
    MODEL CPHYS = SMKLEVEL /SOLUTION;
    RANDOM INTERCEPT /SUB=ID GROUP=SMKLEVEL;
    REPEATED /SUB=ID GROUP=SMKLEVEL;
SAS syntax for models in TABLE 8.6 Here, GROW2GP is coded 0, 1 for the two smoking growth groups, and is used as a linear variable in most of the syntax below. The variable GROW2GPC is set equal to GROW2GP for use as a categorical variable in the second model below, i.e.,

\[
\text{GROW2GPC} = \text{GROW2GP};
\]

Model BS(T) WS(GT)
PROC MIXED METHOD=REML COVTEST;
   CLASS ID;
   MODEL CPHYS = GROW2GP TIME GROW2GP*TIME /SOLUTION;
   RANDOM INTERCEPT TIME /SUB=ID TYPE=UN;
   REPEATED /SUB=ID LOCAL=EXP(GROW2GP TIME GROW2GP*TIME);

Model BS(GT) WS(GT)
PROC MIXED METHOD=REML COVTEST;
   CLASS ID GROW2GPC;
   MODEL CPHYS = GROW2GP TIME GROW2GP*TIME /SOLUTION;
   RANDOM INTERCEPT TIME /SUB=ID TYPE=UN GROUP=GROW2GPC;
   REPEATED /SUB=ID LOCAL=EXP(GROW2GP TIME GROW2GP*TIME);