Three level models for continuous and dichotomous outcomes

SPSS syntax gives a few examples.

three level model for continuous outcome

GENLINMIXED

/DATA\_STRUCTURE SUBJECTS=school\*classroom\*student\_id

/FIELDS TARGET=posttest TRIALS=NONE OFFSET=NONE

/TARGET\_OPTIONS DISTRIBUTION=NORMAL LINK=IDENTITY

/FIXED EFFECTS=school\_setting school\_type teaching\_method n\_student

gender lunch pretest

USE\_INTERCEPT=TRUE

/RANDOM USE\_INTERCEPT=TRUE SUBJECTS=school

COVARIANCE\_TYPE=VARIANCE\_COMPONENTS

/RANDOM USE\_INTERCEPT=TRUE SUBJECTS=school\*classroom

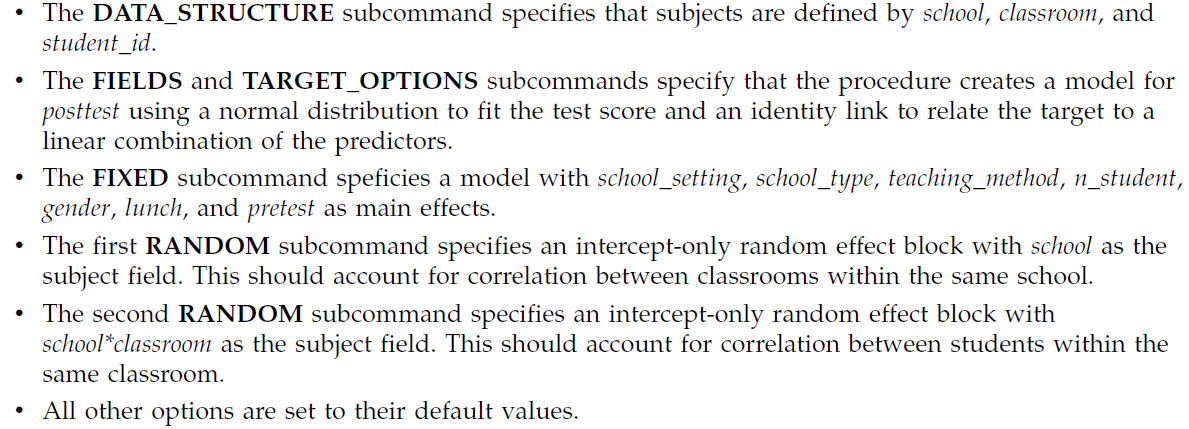
COVARIANCE\_TYPE=VARIANCE\_COMPONENTS

/BUILD\_OPTIONS TARGET\_CATEGORY\_ORDER=ASCENDING

INPUTS\_CATEGORY\_ORDER=ASCENDING MAX\_ITERATIONS=100

CONFIDENCE\_LEVEL=95 DF\_METHOD=RESIDUAL COVB=MODEL

/EMMEANS\_OPTIONS SCALE=ORIGINAL PADJUST=LSD.



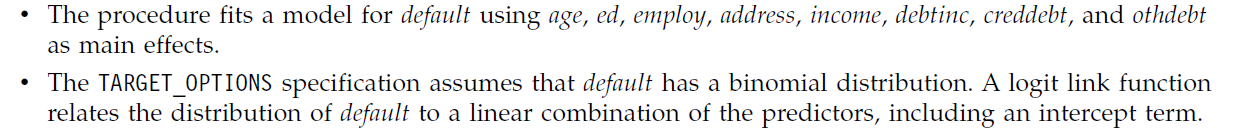
Also, the manual shows a logistic regression example:

GENLINMIXED

/FIELDS TARGET=default

/TARGET\_OPTIONS DISTRIBUTION=BINOMIAL LINK=LOGIT

/FIXED EFFECTS=age ed employ address income debtinc creddebt othdebt.



Combining these gives:

GENLINMIXED

/DATA\_STRUCTURE SUBJECTS=school\*classroom\*student\_id

/FIELDS TARGET=response

/TARGET\_OPTIONS DISTRIBUTION=BINOMIAL LINK=LOGIT

/FIXED EFFECTS=school\_setting school\_type teaching\_method n\_student

gender lunch pretest

USE\_INTERCEPT=TRUE

/RANDOM USE\_INTERCEPT=TRUE SUBJECTS=school

COVARIANCE\_TYPE=VARIANCE\_COMPONENTS

/RANDOM USE\_INTERCEPT=TRUE SUBJECTS=school\*classroom

COVARIANCE\_TYPE=VARIANCE\_COMPONENTS

/BUILD\_OPTIONS TARGET\_CATEGORY\_ORDER=ASCENDING

INPUTS\_CATEGORY\_ORDER=ASCENDING MAX\_ITERATIONS=100

CONFIDENCE\_LEVEL=95 DF\_METHOD=RESIDUAL COVB=MODEL

/EMMEANS\_OPTIONS SCALE=ORIGINAL PADJUST=LSD.

Note:

* As the /DATA\_STRUCTURE SUBJECT= … gives the independent ‘subjects’ I can also guess that it has to be: /DATA\_STRUCTURE SUBJECTS=school\*classroom   
  As the student level is handled by the binary response.
* Two random effects are specified: for school and for classroom within school. The latter is denoted by school\*classroom.