**Appendix**

SPSS Code for Models M1-M6 used in this tutorial

\*\*M1 unconditional means model\*\*

MIXED

qualrec

/CRITERIA = CIN(95) MXITER(100) MXSTEP(5) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0.000001, ABSOLUTE)

/FIXED = | SSTYPE(3)

/METHOD = REML

/PRINT = CORB COVB DESCRIPTIVES SOLUTION TESTCOV

/RANDOM INTERCEPT | SUBJECT(anes\_id) COVTYPE(VC) .

\*\*M2: level one predictors\*\*

MIXED

qualrec with age preop\_ps

/CRITERIA = CIN(95) MXITER(100) MXSTEP(5) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0.000001, ABSOLUTE)

/FIXED = age preop\_ps | SSTYPE(3)

/METHOD = REML

/PRINT = CORB COVB DESCRIPTIVES SOLUTION TESTCOV

/RANDOM INTERCEPT | SUBJECT(anes\_id) COVTYPE(VC) .

\*\*M3: with level two predictors\*\*

MIXED

qualrec with age preop\_ps hospital

/CRITERIA = CIN(95) MXITER(100) MXSTEP(5) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0.000001, ABSOLUTE)

/FIXED = age preop\_ps hospital | SSTYPE(3)

/METHOD = REML

/PRINT = CORB COVB DESCRIPTIVES SOLUTION TESTCOV

/RANDOM INTERCEPT | SUBJECT(anes\_id) COVTYPE(UN) .

\*\*M4 & 5: RANDOM SLOPES FOR BOTH LEV 1 PREDICTORS\*\*

MIXED

qualrec with age preop\_ps hospital

/CRITERIA = CIN(95) MXITER(100) MXSTEP(5) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0.000001, ABSOLUTE)

/FIXED = age preop\_ps hospital | SSTYPE(3)

/METHOD = REML

/PRINT = CORB COVB DESCRIPTIVES SOLUTION TESTCOV

/RANDOM INTERCEPT age preop\_ps | SUBJECT(anes\_id) COVTYPE(UN).

MIXED

qualrec with age preop\_ps hospital

/CRITERIA = CIN(95) MXITER(100) MXSTEP(5) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0.000001, ABSOLUTE)

/FIXED = age preop\_ps hospital | SSTYPE(3)

/METHOD = REML

/PRINT = CORB COVB DESCRIPTIVES SOLUTION TESTCOV

/RANDOM INTERCEPT preop\_ps | SUBJECT(anes\_id) COVTYPE(UN) .

\*\*M6: cross level interaction\*\*

MIXED

qualrec with age preop\_ps hospital

/CRITERIA = CIN(95) MXITER(100) MXSTEP(5) SCORING(1) SINGULAR(0.000000000001) HCONVERGE(0, ABSOLUTE) LCONVERGE(0, ABSOLUTE)

PCONVERGE(0.000001, ABSOLUTE)

/FIXED = age preop\_ps hospital preop\_ps\*hospital | SSTYPE(3)

/METHOD = REML

/PRINT = CORB COVB DESCRIPTIVES SOLUTION TESTCOV

/RANDOM INTERCEPT preop\_ps | SUBJECT(anes\_id) COVTYPE(UN) .