**Mplus 7.10 codes**

**(1) Cross\_lagged pannel model（Mplus code）**

TITLE: CFA model for Cross\_laged;

DATA: FILE IS T2\_T3\_T4VVGE\_cross\_lagged model.dat; ! text file containing raw data in long format

VARIABLE: NAMES ARE id school age sex famliyin

y1-y6 m1-m8 x1-x3

yy1-yy6 mm1-mm8 xx1-xx3

yyy1-yyy6 mmm1-mmm8 xxx1-xxx3;

missing = all(-99);

USEVARIABLES ARE ses Y1-Y6 YY1-YY6 YYY1-YYY6

M1-M8 MM1-MM8 MMM1-MMM8

X1-X3 XX1-XX3 XXX1-XXX3;

grouping =school(1=mid 2=high);

ANALYSIS:

Estimator=MLR;

MODEL:

T1Y BY Y1-Y6;

T2Y BY YY1-YY6;

T3Y BY YYY1-YYY6;

T1M BY M1-M8;

T2M BY MM1-MM8;

T3M BY MMM1-MMM8;

T1X BY X1-X3;

T2X BY XX1-XX3;

T3X BY XXX1-XXX3;

T1X WITH T1M T1Y;

T1M WITH T1Y;

T2X WITH T2M T2Y;

T2M WITH T2Y;

T3X WITH T3M T3Y;

T3M WITH T3Y;

T2X ON T1M(L1)

T1X(L2)

T1Y(L3);

T2M ON T1M(L4)

T1X(L5)

T1Y(L6);

T2Y ON T1M(L7)

T1X(L8)

T1Y(L9);

T3X ON T2M(L10)

T2X(L11)

T2Y(L12);

T3M ON T2M(L13)

T2X(L14)

T2Y(L15);

T3Y ON T2M(L16)

T2X(L17)

T2Y(L18);

T1X T1M T1Y ON famliyin;

Y1 WITH YY1 YYY1;

YY1 WITH YYY1;

Y2 WITH YY2 YYY2;

YY2 WITH YYY2;

Y3 WITH YY3 YYY3;

Y4 WITH YY4 YYY4;

Y5 WITH YY5 YYY5;

Y6 WITH YY6 YYY6;

YY3 WITH YYY3;

YY4 WITH YYY4;

YY5 WITH YYY5;

YY6 WITH YYY6;

X1 WITH XX1 XXX1;

XX1 WITH XXX1;

X2 WITH XX2 XXX2;

XX2 WITH XXX2;

X3 WITH XX3 XXX3;

XX3 WITH XXX3;

M1 WITH MM1 MMM1;

MM1 WITH MMM1;

M2 WITH MM2 MMM2;

MM2 WITH MMM2;

M3 WITH MM3 MMM3;

MM3 WITH MMM3;

M4 WITH MM4 MMM4;

MM4 WITH MMM4;

M5 WITH MM5 MMM5;

MM5 WITH MMM5;

M6 WITH MM6 MMM6;

MM6 WITH MMM6;

M7 WITH MM7 MMM7;

MM7 WITH MMM7;

M8 WITH MM8 MMM8;

MM8 WITH MMM8;

Model High:

T2X ON T1M(LL1)

T1X(LL2)

T1Y(LL3);

T2M ON T1M(LL4)

T1X(LL5)

T1Y(LL6);

T2Y ON T1M(LL7)

T1X(LL8)

T1Y(LL9);

T3X ON T2M(LL10)

T2X(LL11)

T2Y(LL12);

T3M ON T2M(LL13)

T2X(LL14)

T2Y(LL15);

T3Y ON T2M(LL16)

T2X(LL17)

T2Y(LL18);

Model test:

L15=LL15;

OUTPUT: stand TECH1 TECH8 CINTERVAL;

**(2) Between-person and Within-person analyses (Mplus code)**

TITLE: MLM MPLUS FOR VVGE AND AGGRESSION

DATA: FILE BWVVGE.dat; ! text file containing raw data in long format

VARIABLE: NAMES ARE id school AGE SEX SES time X1-X17 WX1-WX17;

missing = all(-99);

USEVARIABLES ARE id age X1-X17 WX1-WX17;

CLUSTER IS id; ! Level-2 grouping identifier

WITHIN ARE WX1-WX17; ! identify variables with only Within variance;

! variables that are not claimed as "BETWEEN ARE" or "WITHIN ARE" can have

! both Within and Between variance

BETWEEN ARE X1-X17; ! identify variables with only Between variance

Define: Center X1-X17(GRANDMEAN);

ANALYSIS: TYPE IS TWOLEVEL RANDOM;

Estimator=MLR;

ALGORITHM=INTEGRATION;

MODEL: ! model specification follows

%WITHIN% ! Model for Within effects follows

! estimate Level-1 (residual) variances for wm and wy

!WVGE WMD WAG(vwx vwm vwy); ! regress m on x, call the slope "aw"

!yw ON mb(bw); ! regress y on m, call the slope "bw"

! m was group-mean centered, so fix its mean to zero

wy by wx1-wx6;

wm by wx7-wx14;

wx by wx15-wx17;

wy on wx;

wm on wx(AW);

wy on wm(BW);

%BETWEEN% ! Model for Between effects follows

bby by x1-x6;

bm by x7-x14;

bx by x15-x17;

bby on bm(BB);

bby on bx;

bm on bx(AB);

MODEL CONSTRAINT: ! section for computing indirect effects

!NEW(INDW INDB); ! name the indirect effects

indw=aw\*bw; ! compute the Within indirect effect

indb=ab\*bb; ! compute the Between indirect effect

OUTPUT: stand TECH1 TECH8 CINTERVAL; ! request parameter specifications, starting values,

! optimation history, and confidence intervals for all effects

**(3) Moderation analysis of age and sex (Mplus code)**

TITLE: MLM MPLUS FOR VVGE AND AGGRESSION

DATA: FILE BWVVGE.dat; ! text file containing raw data in long format

VARIABLE: NAMES ARE id school AGE SEX SES time X1-X17 WX1-WX17;

missing = all(-99);

USEVARIABLES ARE id age X1-X17 WX1-WX17;

CLUSTER IS id; ! Level-2 grouping identifier

WITHIN ARE WX1-WX17; ! identify variables with only Within variance;

! variables that are not claimed as "BETWEEN ARE" or "WITHIN ARE" can have

! both Within and Between variance

BETWEEN ARE age X1-X17; ! identify variables with only Between variance

ANALYSIS: TYPE IS TWOLEVEL RANDOM;

Estimator=MLR;

ALGORITHM=INTEGRATION;

MODEL: ! model specification follows

%WITHIN% ! Model for Within effects follows

! estimate Level-1 (residual) variances for wm and wy

!WVGE WMD WAG(vwx vwm vwy); ! regress m on x, call the slope "aw"

!yw ON mb(bw); ! regress y on m, call the slope "bw"

! m was group-mean centered, so fix its mean to zero

Wy by wx1-wx6;

wm by wx7-wx14;

wx by wx15-wx17;

S | wy on wx;

wm on wx;

%BETWEEN% ! Model for Between effects follows

bby by x1-x6;

bm by x7-x14;

bx by x15-x17;

s on age (b3);

[s](b1);

! regress mmean on xmean, call the slope "ab"

!BVGE BMD BAG(vbx vbm vby) ; ! regress y on mmean, call the slope "bb"

!yb ON int2(cb); ! regress y on xmean

MODEL CONSTRAINT:

NEW(LOW\_W MED\_W HIGH\_W SIMP\_LO SIMP\_MED SIMP\_HI);

LOW\_W = -1; ! -1 SD below mean of W

MED\_W = 0; ! mean of W

HIGH\_W = 1; ! +1 SD below mean of W

! Now calc simple slopes for each value of W

SIMP\_LO = b1 + b3\*LOW\_W;

SIMP\_MED = b1 + b3\*MED\_W;

SIMP\_HI = b1 + b3\*HIGH\_W;

! Use loop plot to plot total effects of X on Y for low, med, high values of W

! NOTE - values from -3 to 3 in LOOP() statement since

! X is factor with mean set at default of 0

PLOT(LOMOD MEDMOD HIMOD);

LOOP(XVAL,-3,3,0.1);

LOMOD = (b1 + b3\*LOW\_W)\*XVAL;

MEDMOD = (b1 + b3\*MED\_W)\*XVAL;

HIMOD = (b1 + b3\*HIGH\_W)\*XVAL;

PLOT:

TYPE = plot2;

!MODEL CONSTRAINT: ! section for computing indirect effects

!NEW(ICC1 ICC2 ICC3); ! name the indirect effects

!indw=aw\*bw; ! compute the Within indirect effect

!indb=ab\*bb; ! compute the Between indirect effect

! totaw =(aw\*bw)+cw;

!totab =(ab\*bb)+cb;

!icc1=vx/(vx+vwx);

!icc2=vm/(vm+vwm);

!icc3=vy/(vy+vwy);

OUTPUT: stand TECH1 TECH8 CINTERVAL; ! request parameter specifications, starting values,

! optimation history, and confidence intervals for all effects