

Mplus Code for Data Generation

1a. Mplus code for Data Generation for Model 1 across two groups, for Model_10_1_2 (e.g., 20% noninvariance, a small latent difference $\Delta = 0.25$, and sample size $n = 250$)

TITLE: A Monte Carlo simulation study for measurement invariance across two groups

MONTECARLO: NAMES = y1-y10;

NGROUPS = 2;

NOBSERVATIONS = 250 250;

NREPS = 1000;

SEED = 12345;

REPSAVE = ALL;

SAVE = MI*.dat;

MODEL POPULATION:

F BY y1-y10*0.7;

F@1; [F@0];

y1-y10*0.51; [y1-y10*1.5];

MODEL POPULATION-g2:

F BY y1*0.5 y2*0.6 y3-y10*0.7;

F@1.25; [F@0.25];

y1*0.75 y2*0.64 y3-y10*0.51; [y1*1.75 y2*2 y3-y10*1.5];

MODEL:

F BY y1*0.7 y2-y10*0.7;

F@1; [F@0];

y1-y10*0.51; [y1-y10*1.5];

MODEL g2:

F BY y1*0.5 y2*0.6 y3-y10*0.7;

F@1.25; [F@0.25];

y1*0.75 y2*0.64 y3-y10*0.51; [y1*1.75 y2*2 y3-y10*1.5];

OUTPUT: TECH9;

Mplus Code for Data Analysis

2a. Mplus code for the MIMIC-interaction with the constrained baseline model (i.e., constant anchor method)

```
TITLE: MIMIC-interaction with the constrained baseline model (k=10)

DATA: FILE = <filename>;

ANALYSIS: TYPE = RANDOM;

ALGORITHM=INTEGRATION;

VARIABLE: NAMES = y1-y10 g;

MODEL: F BY y1* y2-y10;

      F@1; F ON g;
```

2b. Mplus code for the MIMIC-interaction with the constrained baseline approach (i.e., constant anchor method) to examine loading and intercept measurement invariance of y1, for example

```
TITLE: MIMIC-interaction with the constrained baseline to examine y1 (k=10)

DATA: FILE = <filename>;

ANALYSIS: TYPE = RANDOM;

ALGORITHM=INTEGRATION;

VARIABLE: NAMES = y1-y10 g;

MODEL: F BY y1* y2-y10;

      F@1; F ON g;

      Fg | F XWITH g;

      y1 ON g Fg;
```

Mplus Code for Empirical Illustration

3a. *Mplus* code for the MIMIC-interaction with the constrained baseline model (i.e., constant anchor method) in empirical illustration

```
TITLE: MIMIC-interaction with the constrained baseline model (k=9)

DATA: FILE = <filename>;

ANALYSIS: TYPE = RANDOM;

ALGORITHM=INTEGRATION;

VARIABLE: NAMES = y1-y9 g;

MODEL: F BY y1* y2-y9;

      F@1; F ON g;
```

3b. *Mplus* code for the MIMIC-interaction with the constrained baseline approach (i.e., constant anchor method) to examine loading and intercept measurement invariance of y1, for example, in empirical illustration

```
TITLE: MIMIC-interaction with the constrained baseline to examine y1 (k=9)

DATA: FILE = <filename>;

ANALYSIS: TYPE = RANDOM;

ALGORITHM=INTEGRATION;

VARIABLE: NAMES = y1-y9 g;

MODEL: F BY y1* y2-y10;

      F@1; F ON g;

      Fg | F XWITH g;

      y1 ON g Fg;
```

3c. *Mplus* code for the MIMIC-interaction with the constrained baseline model (i.e., constant anchor method) after removing item 7 from all other anchors in empirical illustration

TITLE: MIMIC-interaction with the constrained baseline model ($k=9$) after removing item 7

DATA: FILE = <filename>;

ANALYSIS: TYPE = RANDOM;

ALGORITHM=INTEGRATION;

VARIABLE: NAMES = y1-y9 g;

MODEL: F BY y1* y2-y9;

F@1; F ON g;

Fg | F XWITH g;

y7 ON g Fg;

3d. *Mplus* code for the MIMIC-interaction with the constrained baseline approach (i.e., constant anchor method) to examine loading and intercept measurement invariance of y1, for example, after removing item 7 from all other anchors in empirical illustration

TITLE: MIMIC-interaction with the constrained baseline model to examine y1 ($k=9$) after removing item 7

DATA: FILE = <filename>;

ANALYSIS: TYPE = RANDOM;

ALGORITHM=INTEGRATION;

VARIABLE: NAMES = y1-y9 g;

MODEL: F BY y1* y2-y10;

F@1; F ON g;

Fg | F XWITH g;

y1 y7 ON g Fg;