Latent change score modeling analysis

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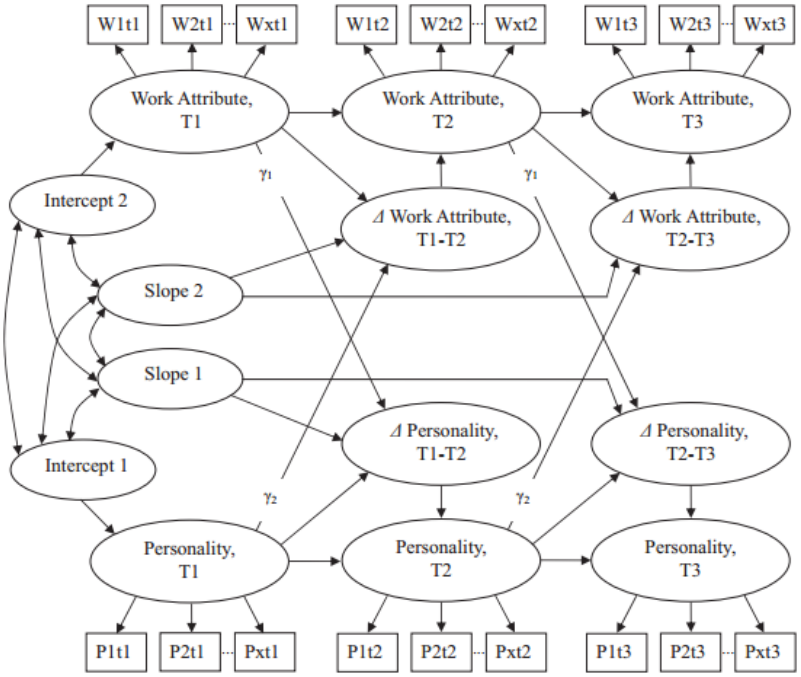
example



Measurement model：

Estimate the residual correlation of the same item at different time points：

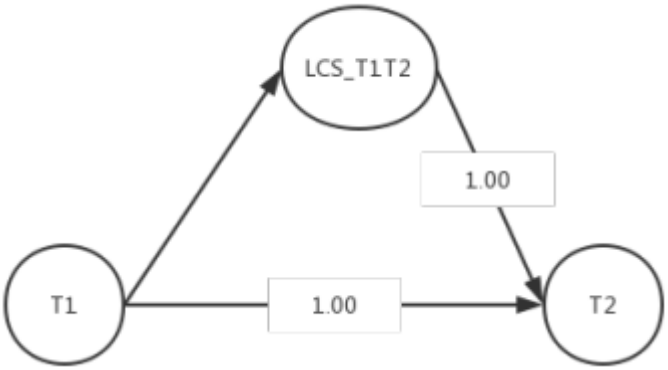
W1t1 WITH W1t2……

Construct Model：

1. Define LCS Model：

principle：T2 = T1 + Δ （T2 T1: latent score）

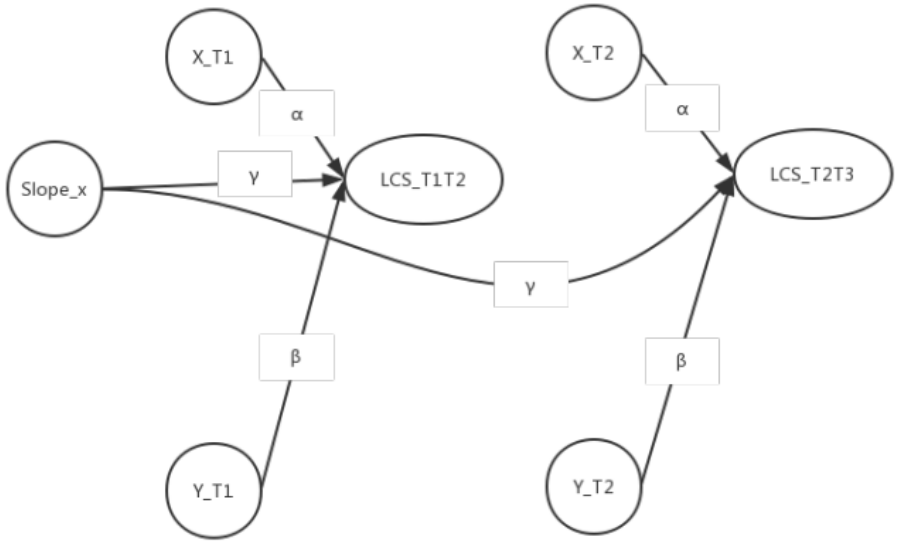
Realization：



* Defining latent variables with latent variables

Work_attribute_T2 ON Work_attribute_T1@1;
LCS_work_T1_t2 BY Work_attribute_T2@1;
Work_attribute_T2@0;
! Limit the residual to 0: because T2 is interpreted by T1+Δ

2. parameter estimation



α、β

XLCS12 ON XT1*-0.6(xlcsx) **! The coefficients of different time intervals are identical.**
YT1*0.3(xlcsy);
XLCS23 ON XT2*-0.6(xlcsx)
YT2*0.3(xlcsy);

γ

!Use slope to explain the remaining variance of latent change after being interpreted by XT and YT

```
slopeX    BY XLCS12*0.3(SX)
                XLCS23*0.3(SX);
SLOPEX@1;
XLCS12@0 XLCS23@0;
```
! LCS is interpreted by slope x_t1 y_t1

! The intercept term in the model graph is used to explain X_T1 without affecting the estimation results.

```
interceptX BY XT1@1;
XT1@0;
```

Appendix_code

```
MODEL:
  [X1-X12@0];
  XT1 BY X1*0.75(1)
         X2*0.75(2)
         X3*0.75(3)
         X4*0.75(4);
  XT2 BY X5*0.75(1)
         X6*0.75(2)
         X7*0.75(3)
         X8*0.75(4);
  XT3 BY X9*0.75(1)
         X10*0.75(2)
         X11*0.75(3)
         X12*0.75(4);
  XT1@1 XT2@1 XT3@1;
  X1-X12*0.44;


  [Y1-Y12@0];
  YT1 BY Y1*0.85(110)
         Y2*0.85(12)
         Y3*0.85(13)
         Y4*0.85(14);
  YT2 BY Y5*0.85(110)
```

```
        Y6*0.85(12)
        Y7*0.85(13)
        Y8*0.85(14);
YT3 BY Y9*0.85(110)
        Y10*0.85(12)
        Y11*0.85(13)
        Y12*0.85(14);
YT1@1 YT2@1 YT3@1;
Y1-Y12*0.36;

X1 X5 X9 WITH X1*0.15 X5*0.15 X9*0.15;
X2 X6 X10 WITH X2*0.15 X6*0.15 X10*0.15;
X3 X7 X11 WITH X3*0.15 X7*0.15 X11*0.15;
X4 X8 X12 WITH X4*0.15 X8*0.15 X12*0.15;

Y1 Y5 Y9 WITH Y1*0.12 Y5*0.12 Y9*0.12;
Y2 Y6 Y10 WITH Y2*0.12 Y6*0.12 Y10*0.12;
Y3 Y7 Y11 WITH Y3*0.12 Y7*0.12 Y11*0.12;
Y4 Y8 Y12 WITH Y4*0.12 Y8*0.12 Y12*0.12;

!define latent change score
XT2 ON XT1@1;
XT3 ON XT2@1;
XLCS12 BY XT2@1;
XLCS23 BY XT3@1;

XLCS12 ON XT1*-0.6(xlcsx)
          YT1*0.3(xlcsy);
XLCS23 ON XT2*-0.6(xlcsx)
          YT2*0.3(xlcsy);

!define latent change score
YT2 ON YT1@1;
YT3 ON YT2@1;
YLCS12 BY YT2@1;
YLCS23 BY YT3@1;

YLCS12 ON YT1*-0.7(ylcsy)
          XT1*0.2(ylcsx);
YLCS23 ON YT2*-0.7(ylcsy)
          XT2*0.2(ylcsx);

!用 slope 解释 latent change  被 XT YT 解释后剩下的方差
slopeX    BY XLCS12*0.3(SX)
```

```
                XLCS23*0.3(SX);
SLOPEX@1;
interceptX BY XT1@1;

slopeY    BY YLCS12*0.3(SY)
                YLCS23*0.3(SY);
SLOPEY@1;
interceptY BY YT1@1;
slopeX@1 slopeY@1 interceptX@1 interceptY@1;

!限定残差
XT1@0 XT2@0 XT3@0 XLCS12@0 XLCS23@0;
YT1@0 YT2@0 YT3@0 YLCS12@0 YLCS23@0;
```