Mplus analysis code for:

Big-Fish-Little-Pond Effects on Ninth-Grade Students' Mathematics and Language Self-Concepts: The Moderating Role of Cognitive Ability

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TITLE: Model 1, basic BFLPE model
DATA: File is bflpe.dat;
VARIABLE: Names are RS9SCH NormWgt6 MaGrade MSC1 MSC2 MSC3;
Usevariables are MaGrade MSC1 MSC2 MSC3;
Cluster = RS9SCH;
Weight is NormWgt6;
WTSCALE=UNSCALED;
Missing are all (-999);
DEFINE: STANDARDIZE MaGrade MSC1 MSC2 MSC3;

ANALYSIS:
Type = twolevel;
Estimator = MLR;

MODEL:
 %WITHIN%
      MSC_w BY MSC1 (1);
      MSC_w BY MSC2 (2);
      MSC_w BY MSC3 (3);
      MSC_w ON MaGrade (b_within);
      MaGrade (Psi_W);
      MSC_w (Theta_W);

 %BETWEEN%
      MSC_b BY MSC1 (1);
      MSC_b BY MSC2 (2);
      MSC_b BY MSC3 (3);
      MSC_b ON MaGrade (b_betwn);
      MaGrade (Psi_B);
      MSC_b (Theta_B);

MODEL CONSTRAINT:
new(bflpe);
   bflpe = b_betwn - b_within;

new(ES2);
   Es2= bflpe*(2*sqrt(Psi_B)/sqrt(Psi_W*b_within**2 + Theta_W));

OUTPUT: Stdyx;
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TITLE: Model 2, BFLPE model with direct effects of gender and cogn
DATA: File is bflpe.dat;
VARIABLE: Names are RS9SCH NormWgt6 MaGrade gender cogn MSC1 MSC2 MSC3;
Usevariables are MaGrade gender cogn MSC1 MSC2 MSC3;
Cluster = RS9SCH;
Weight is NormWgt6;
WTSCALE=UNSCALED;
Missing are all (-999);
Within = gender cogn;
DEFINE: STANDARDIZE MaGrade gender cogn MSC1 MSC2 MSC3;

ANALYSIS:
Type = twolevel;
Estimator = MLR;

MODEL:
 %WITHIN%
      MSC_w BY MSC1 (1);
      MSC_w BY MSC2 (2);
      MSC_w BY MSC3 (3);

      MSC_w ON MaGrade (b_within);
      MSC_w ON cogn;
      MSC_w ON gender;
      MaGrade with cogn;

      MaGrade (Psi_W);
      MSC_w (Theta_W);

 %BETWEEN%
      MSC_b BY MSC1 (1);
      MSC_b BY MSC2 (2);
      MSC_b BY MSC3 (3);

      MSC_b ON MaGrade (b_betwn);
      MaGrade (Psi_B);
      MSC_b (Theta_B);

MODEL CONSTRAINT:
new(bflpe);
   bflpe = b_betwn - b_within;

new(ES2);
   Es2= bflpe*(2*sqrt(Psi_B)/sqrt(Psi_W*b_within**2 + Theta_W));

OUTPUT: Stdyx;
```

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TITLE: Model 3, BFLPE model with cross-level interaction
DATA: File is bflpe.dat;
VARIABLE: Names are RS9SCH NormWgt6 MaGrade gender cogn MSC1 MSC2 MSC3;
Usevariables are MaGrade gender cogn MSC1 MSC2 MSC3;
Cluster = RS9SCH;
Missing are all (-999);
Within = gender cogn;
DEFINE: STANDARDIZE MaGrade gender cogn MSC1 MSC2 MSC3;

ANALYSIS:
Type = twolevel random;
Estimator = BAYES;
H1ITERATIONS = 10000;

MODEL:
 %WITHIN%
      MSC_w BY MSC1 (1);
      MSC_w BY MSC2 (2);
      MSC_w BY MSC3 (3);

      MSC_w ON gender;
      s | MSC_w ON cogn;
      MSC_w ON MaGrade (b_within);
      MaGrade with cogn;
      MaGrade (Psi_W);
      MSC_w (Theta_W);

 %BETWEEN%
      MSC_b BY MSC1 (1);
      MSC_b BY MSC2 (2);
      MSC_b BY MSC3 (3);

      MSC_b ON MaGrade (b_betwn);
      s ON MaGrade;
      s with MSC_b;
      MaGrade (Psi_B);
      MSC_b (Theta_B);

MODEL CONSTRAINT:
new(bflpe);
   bflpe = b_betwn - b_within;

new(ES2);
   Es2= bflpe*(2*sqrt(Psi_B)/sqrt(Psi_W*b_within**2 + Theta_W));

OUTPUT: Stdyx;
```