PSC205A Assignment 07: Longitudinal Multivariate

Please, upload your assignment to CANVAS as "HM7_LastName" Thanks!

The file "mhs.csv" contains longitudinal data from a study of motivation in high school. The variables are:

id
pc1 pc2 pc3 pc4
mot1 mot2 mot3 mot4
pc1_1 pc2_1 pc3_1 pc4_1 mot1_1 mot2_1 mot3_1 mot4_1 mot5_1
pc1_2 pc2_2 pc3_2 pc4_2 mot1_2 mot2_2 mot3_2 mot4_2 mot5_2
pc1_3 pc2_3 pc3_3 pc4_3 mot1_3 mot2_3 mot3_3 mot4_3 mot5_3
pc1_4 pc2_4 pc3_4 pc4_4 mot1_4 mot2_4 mot3_4 mot4_4 mot5_4
male female

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pc   = perceived competence (composite score across 4 items)
mot   = academic motivation (composite score across 5 items)
pc1_1 = perceived competence item 1 at time1
pc1_2 = perceived competence item 2 at time1
pc4_4 = perceived competence item 4 at time4

mot1_1 = motivation item 1 at time1
mot2_1 = motivation item 2 at time1
mot5_4 = motivation item 5 at time4
male   = (1 = male, 0 = female)
female = (1 = female, 0 = male)

For this assignment, you will be conducting longitudinal analyses of perceived competence and motivation. The goal is to describe changes in both constructs across time in and identify possible interrelations in such changes.

1. Using the composite scores in the data (i.e., pc1-pc4; mot1-mot4), plot the individual trajectories across the measurement occasions (one figure for each variable). Describe the figures and indicate what you would expect to find in the analyses based on these plots.

2. Using the composite scores in the data (i.e., pc1-pc4; mot1-mot4), conduct a growth curve analysis of perceived competence and, separately, of motivation. Report the results and describe the findings (one paragraph).

3. Using the composite scores, choose one of the two variables and test for differences between males and females. Report the results and describe the findings (one paragraph).

4. Using the composite scores, conduct analyses that examine interrelations between perceived competence and motivation over time. Report the results and describe the findings (one paragraph).

5. Using the items for perceived competence (i.e., pc1_1-pc4_4), conduct a growth curve analysis that takes into account the measurement structure. For this, first examine factorial invariance and then fit a growth curve. Report the results and describe the findings (one or two paragraphs).

6. Extra. Using the items for perceived competence and motivation (i.e., pc1_1-pc4_4; mot1_1-mot5_4), specify a model that examines changes in the latent factors for perceived competence and motivation, as well as interrelations between those changes over time. Report the results and describe the findings. Make sure to compare these results with those from #4.