

## Homework 2

Due Feb. 23, 2012, 1pm

For all the following problems, please type your answers and provide the relevant printouts. Each answer should be no longer than 2-3 paragraphs in length.

In 1999, NPC Research Inc, conducted a school survey of over 2,000 students in Oregon. The survey included questions about drug and alcohol use, but also questions about the student's perceptions of his or her neighborhood. Responses to the following items were on a 4-point scale (0=NO! 1=no 2=yes 4=YES!). The ASCII data file and the Mplus input file can be downloaded from <http://www.ioa.pdx.edu/newsom/data.htm> (you will need to add the appropriate model statements).

CRIME, How much does "crime" and/or "drug selling" describe your neighborhood?

FIGHTS, How much does "fights" describe your neighborhood?

ABANDON, How much does "lots of empty or abandoned buildings" describe your neighborhood?

GRAFITTI, How much does "lots of graffiti" describe your neighborhood?

GETOUT, I'd like to get out of my neighborhood.

INANDOUT, People move in and out of my neighborhood.

1. Use Mplus to conduct a confirmatory factor analysis testing whether a single factor model fits the data. Report the standardized loadings, their significance, the chi-square for the model, the CFI, and the SRMR. Does this model fit the data well? Why or why not? Do the factor loadings suggest there are any poor items? Why or why not? (save your input program for later use in Problem 7).
2. Test to see if the items really belong to two related latent variables (i.e., a two-factor model) in which CRIME and FIGHTS load on one factor and ABANDON, GRAFITTI, GETOUT, and INANDOUT load on a second factor. Report the standardized loadings, their significance, the chi-square for the model, the CFI, and the SRMR. Does this model fit the data well? Why or why not?
3. Test whether the items belong to a three-factor model with CRIME and FIGHTS on one factor, ABANDON and GRAFITTI on the second factor, and GETOUT and INANDOUT on the third factor. Report the standardized loadings, their significance, the chi-square for the model, the CFI, and the SRMR. Does this model fit the data well? Why or why not?
4. Compare the fit of the one-, two-, and three-factor models using chi-square difference tests to see if there are significant differences in fit. Report and interpret your findings.
5. For the three-factor model tested in Problem 3, show by hand how the degrees of freedom are derived (show your work).
6. a. Test the three-factor model again (same item assignments as in Problem 3), but this time set the variance of the latent variables to 1 instead of using an indicator variable for each factor. Request modification indices (for later use only). How is the output similar or different from that obtained in Problem 3?
  - b. Use the information contained in the printout from Problem 6 to compute Bollen's IFI by hand. Interpret the result and compare to the value of the CFI obtained from Mplus.

7. a. Rerun the single-factor model from Problem 1, but request the modification indices. Report and interpret the two highest modification indices (including the M.I. and the StdYX E.P.C.).

b. Add the appropriate changes to the model according to the two highest modification indices and retest the model. Request the modification indices again and report your findings. Examine the biggest modification index and speculate about what you might find if you made that change in the model.

8. Using the three factors from Problem 3, test the following model to see whether the state of neighborhood buildings (ABANDON, GRAFFITI) or neighborhood violence (CRIME, FIGHTS) is a stronger predictor of residents' desire to leave the neighborhood (GETOUT, INANDOUT).

