MGCFA Guidelines

1. Set up your regular CFA model.
   1. Pull in the data.
   2. Turn on options you want to examine.
      1. For example, standardized estimates, SMCs, tests for normality and outliers are pretty common.
   3. Include everyone – no groups.
   4. One of the regression weight parameters (the lines from the factor to the question) should be set to one for each factor.
      1. Does this automatically if you use the factor->question-> arrow function icon.
   5. Factors should be correlated.
   6. Run this model.
   7. Mark the fit for the model.
   8. Test the model against other models if necessary.
      1. Use a chi-square difference test if nested, AIC/ECVI if not nested.
2. Test the final edited CFA model for groups.
   1. Go to manage groups. Label ONE GROUP ONLY.
   2. Go to the data import icon -> you should see the one line for the group/one entry for the data.
   3. Click on grouping variable and pick the variable with the group labels.
   4. Click on the value to pick which group you want to test first.
   5. Run this model and note the fit indices.
   6. Go back to the data import icon.
      1. Change the grouping value to GROUP 2. You still are only testing one group at a time.
   7. Run this model and note the fit indices.
3. Building the multigroup models.
   1. Add groups.
      1. Go to manage models.
      2. Click new.
      3. Label both models so you know which is which.
      4. Go to the data import window.
      5. Put the in the dataset for the second group.
      6. Add the grouping variable.
      7. Add the group value.
      8. Make sure your group labels match the group values you have indicated under value.
   2. Means and intercepts.
      1. Go to view > analysis properties.
      2. Under the estimation tab, click on estimate means and intercepts.
   3. Models.
      1. Analyze > multi-group models.
      2. Click ok for the warning message.
      3. Click ok to get all models.
   4. Label/fix up models.
      1. First model should be BLANK and labeled Configural invariance or equal form.
      2. Second model should only have A values and be labeled metric invariance.
      3. Third model should be labeled scalar invariance and have A and I values set to equal.
      4. Fourth model can be deleted (we are not going to talk about structural covariances here).
      5. Fifth model will be strict factorial invariance, with A, I and V values set to equal.
         1. You will need to delete the CCC and VVV lines that AMOS puts in automatically.
   5. Run these models and note fit indices.
4. Post/Analyze.
   1. Look at the change in CFI.
   2. If the model fit has a DROP in CFI > .01, you would say that the more strict model (lower one) is not invariant.
   3. You will test THAT model for partial invariance.
   4. Partial invariance
      1. Create a new model under manage models.
      2. Copy the level of invariance you want to test (i.e. a, i values from the model where invariance started to suck).
      3. Take out the first equality (i.e. i1\_1 = i1\_2).
      4. This will test the item label (remember this is NOT the same thing as question number) that is MISSING. So you will always have one less than the number of questions you have.
      5. Write down the change in CFI (up down how much). You really only care about the UP ones.
      6. Go back to the models and add the first one back in (so you should add i1\_1 = i1\_2 (or whatever you did last) back.
      7. Delete the second equality.
      8. Repeat.
      9. You will test one at a time. Make sure you haven’t deleted more than one at once.
   5. Figure out which ones are highest.
      1. If two of them have the highest values, use both.
      2. Then go back and delete the lines for the partial invariance test of the equalities that helped you to the CFI you need (i.e. a drop of .009 or less).
      3. Do not add all of them, but only the highest ones that get you up to the right CFI level.
   6. Look at those values.
      1. Go into estimates.
      2. Figure out which labels match the questions.
      3. Write down the estimates for the items/factor loadings/etc. that are different for each group. If they aren’t changing you are looking at the wrong one or have forgotten to “free” them.
      4. Now you should see what the difference is between groups.
      5. Check out the question and try to figure out why you get those differences.