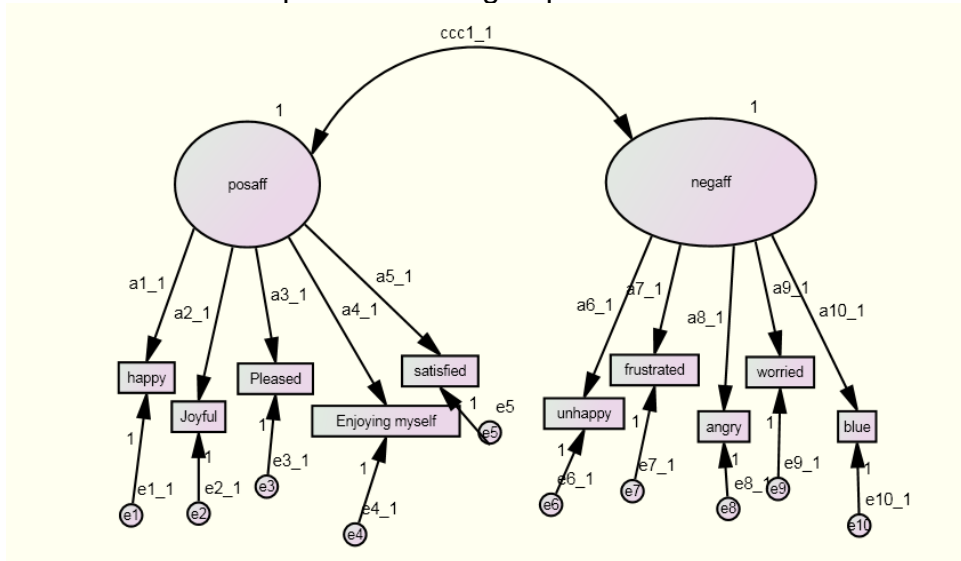


Amos Example of Multigroup Analysis

In Amos, one must set up separate SPSS data files for each group and store them. Once this has been accomplished, go to the Analyze menu and choose Manage Groups. The Manage Groups dialog allows the user to give names to each group. By default, they are named Group Number 1, Group Number 2, etc. You can replace these with the names you use for your data (e.g., "notwidow" and "widow" as in my example). Use the data file dialog box to choose each group data set.

One diagram is typically drawn to apply to each group ("same form"). Amos labels each of the parameters by default using a number system (e.g., a1_1, a2_1, etc). **If the same labels are used in the two groups the same estimate will be given for that parameter (i.e., the parameter is set equal across groups).** In the tree at the left of the graphics window, you will see the names of your groups. Clicking on the names toggles between the two group models. **By default the labels are the same, and if you want to freely estimate them across groups (separate estimates for a parameter), you must give them different names and under the "parameters" tab, you must unclick the box that says "All groups."** In my model (not shown), I labeled the second group with _2 (e.g., a1_2, a2_2, a3_2 etc) to change the names across groups and allow parameters to differ across groups. Change the names by using the object properties dialog box. If there are many parameters that must be freed across groups, this is a time-consuming process.

Below all the output is labeled "unconstrained," which has nothing to do with whether constraints were imposed across groups.



All Parameters Free Across Groups

Result (Unconstrained)

Minimum was achieved
 Chi-square = 142.118
 Degrees of freedom = 70
 Probability level = .000

Regression Weights: (notwidow - Unconstrained)

| | | | Estimate | S.E. | C.R. | P | Label |
|---------|------|--------|----------|------|--------|-----|-------|
| panas1 | <--- | posaff | .828 | .050 | 16.410 | *** | a1_1 |
| panas2 | <--- | posaff | .957 | .065 | 14.621 | *** | a2_1 |
| panas3 | <--- | posaff | .848 | .052 | 16.379 | *** | a3_1 |
| panas4 | <--- | posaff | .900 | .054 | 16.683 | *** | a4_1 |
| panas5 | <--- | posaff | .849 | .057 | 14.860 | *** | a5_1 |
| panas6 | <--- | negaff | .858 | .052 | 16.634 | *** | a6_1 |
| panas7 | <--- | negaff | .680 | .059 | 11.435 | *** | a7_1 |
| panas9 | <--- | negaff | .389 | .050 | 7.719 | *** | a8_1 |
| panas10 | <--- | negaff | .788 | .076 | 10.433 | *** | a9_1 |
| panas8 | <--- | negaff | .778 | .054 | 14.445 | *** | a10_1 |

Covariances: (notwidow - Unconstrained)

| | | | Estimate | S.E. | C.R. | P | Label |
|--------|------|--------|----------|------|---------|-----|--------|
| posaff | <--> | negaff | -.625 | .049 | -12.877 | *** | ccc1_1 |

Variances: (notwidow - Unconstrained)

| | | Estimate | S.E. | C.R. | P | Label |
|--------|--|----------|------|--------|-----|-------|
| posaff | | 1.000 | | | | |
| negaff | | 1.000 | | | | |
| e1 | | .150 | .020 | 7.592 | *** | e1_1 |
| e2 | | .367 | .042 | 8.684 | *** | e2_1 |
| e3 | | .159 | .021 | 7.621 | *** | e3_1 |
| e4 | | .158 | .022 | 7.312 | *** | e4_1 |
| e5 | | .269 | .031 | 8.587 | *** | e5 |
| e6 | | .120 | .027 | 4.485 | *** | e6_1 |
| e7 | | .423 | .047 | 8.944 | *** | e7_1 |
| e8 | | .390 | .041 | 9.609 | *** | e8_1 |
| e9 | | .748 | .061 | 12.308 | *** | e9_2 |
| e10 | | .241 | .024 | 10.025 | *** | e10_2 |

Regression Weights: (widow - Unconstrained)

| | | | Estimate | S.E. | C.R. | P | Label |
|---------|------|--------|----------|------|--------|-----|-------|
| panas1 | <--- | posaff | .745 | .054 | 13.690 | *** | a1_2 |
| panas2 | <--- | posaff | .865 | .071 | 12.108 | *** | a2_2 |
| panas3 | <--- | posaff | .791 | .055 | 14.353 | *** | a3_2 |
| panas4 | <--- | posaff | .855 | .058 | 14.834 | *** | a4_2 |
| panas5 | <--- | posaff | .830 | .062 | 13.326 | *** | a5_2 |
| panas6 | <--- | negaff | .800 | .053 | 14.965 | *** | a6_2 |
| panas7 | <--- | negaff | .596 | .065 | 9.186 | *** | a7_2 |
| panas9 | <--- | negaff | .380 | .054 | 7.016 | *** | a8_2 |
| panas10 | <--- | negaff | .809 | .085 | 9.498 | *** | a9_2 |
| panas8 | <--- | negaff | .744 | .059 | 12.651 | *** | a10_2 |

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Covariances: (widow - Unconstrained)

| | Estimate | S.E. | C.R. | P | Label |
|--------------------|----------|------|---------|-----|--------|
| posaff <--> negaff | -.673 | .050 | -13.505 | *** | ccc1_2 |

Variances: (widow - Unconstrained)

| | Estimate | S.E. | C.R. | P | Label |
|--------|----------|------|--------|-----|-------|
| posaff | 1.000 | | | | |
| negaff | 1.000 | | | | |
| e1 | .176 | .024 | 7.254 | *** | e1_2 |
| e2 | .405 | .051 | 7.939 | *** | e2_2 |
| e3 | .153 | .023 | 6.756 | *** | e3_2 |
| e4 | .145 | .023 | 6.251 | *** | e4_2 |
| e5 | .250 | .033 | 7.460 | *** | e5_2 |
| e6 | .098 | .026 | 3.761 | *** | e6_2 |
| e7 | .443 | .054 | 8.241 | *** | e7_2 |
| e8 | .357 | .042 | 8.573 | *** | e8_2 |
| e9 | .748 | .061 | 12.308 | *** | e9_2 |
| e10 | .241 | .024 | 10.025 | *** | e10_2 |

Loadings Constrained Equal Across Groups

Notes for Model (Unconstrained)

Computation of degrees of freedom (Unconstrained)

| | |
|------------------------------------------------|-----|
| Number of distinct sample moments: | 110 |
| Number of distinct parameters to be estimated: | 30 |
| Degrees of freedom (110 - 30): | 80 |

Result (Unconstrained)

Minimum was achieved
 Chi-square = 145.145
 Degrees of freedom = 80
 Probability level = .000

Regression Weights: (notwidow - Unconstrained)

| | Estimate | S.E. | C.R. | P | Label |
|---------------------|----------|------|--------|-----|-------|
| panas1 <--- posaff | .794 | .037 | 21.437 | *** | a1_1 |
| panas2 <--- posaff | .918 | .048 | 19.031 | *** | a2_1 |
| panas3 <--- posaff | .823 | .038 | 21.815 | *** | a3_1 |
| panas4 <--- posaff | .881 | .039 | 22.353 | *** | a4_1 |
| panas5 <--- posaff | .842 | .042 | 19.978 | *** | a5_1 |
| panas6 <--- negaff | .833 | .037 | 22.347 | *** | a6_1 |
| panas7 <--- negaff | .645 | .044 | 14.689 | *** | a7_1 |
| panas9 <--- negaff | .386 | .037 | 10.460 | *** | a8_1 |
| panas10 <--- negaff | .798 | .057 | 14.088 | *** | a9_1 |
| panas8 <--- negaff | .764 | .040 | 19.104 | *** | a10_1 |

Covariances: (notwidow - Unconstrained)

| | Estimate | S.E. | C.R. | P | Label |
|--------------------|----------|------|---------|-----|--------|
| posaff <--> negaff | -.613 | .048 | -12.779 | *** | ccc1_1 |

Variances: (notwidow - Unconstrained)

| | Estimate | S.E. | C.R. | P | Label |
|--------|----------|------|-------|-----|-------|
| posaff | 1.000 | | | | |
| negaff | 1.000 | | | | |
| e1 | .152 | .020 | 7.748 | *** | e1_1 |
| e2 | .371 | .042 | 8.756 | *** | e2_1 |

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| | Estimate | S.E. | C.R. | P | Label |
|-----|----------|------|--------|-----|-------|
| e3 | .159 | .021 | 7.677 | *** | e3_1 |
| e4 | .156 | .021 | 7.301 | *** | e4_1 |
| e5 | .266 | .031 | 8.547 | *** | e5 |
| e6 | .123 | .026 | 4.777 | *** | e6_1 |
| e7 | .426 | .047 | 9.043 | *** | e7_1 |
| e8 | .390 | .041 | 9.607 | *** | e8_1 |
| e9 | .748 | .061 | 12.307 | *** | e9_2 |
| e10 | .240 | .024 | 10.010 | *** | e10_2 |

Regression Weights: (widow - Unconstrained)

| | | Estimate | S.E. | C.R. | P | Label |
|---------|-------------|----------|------|--------|-----|-------|
| panas1 | <--- posaff | .794 | .037 | 21.437 | *** | a1_1 |
| panas2 | <--- posaff | .918 | .048 | 19.031 | *** | a2_1 |
| panas3 | <--- posaff | .823 | .038 | 21.815 | *** | a3_1 |
| panas4 | <--- posaff | .881 | .039 | 22.353 | *** | a4_1 |
| panas5 | <--- posaff | .842 | .042 | 19.978 | *** | a5_1 |
| panas6 | <--- negaff | .833 | .037 | 22.347 | *** | a6_1 |
| panas7 | <--- negaff | .645 | .044 | 14.689 | *** | a7_1 |
| panas9 | <--- negaff | .386 | .037 | 10.460 | *** | a8_1 |
| panas10 | <--- negaff | .798 | .057 | 14.088 | *** | a9_1 |
| panas8 | <--- negaff | .764 | .040 | 19.104 | *** | a10_1 |

Covariances: (widow - Unconstrained)

| | | Estimate | S.E. | C.R. | P | Label |
|--------|-------------|----------|------|---------|-----|--------|
| posaff | <--> negaff | -.691 | .044 | -15.555 | *** | ccc1_2 |

Variances: (widow - Unconstrained)

| | Estimate | S.E. | C.R. | P | Label |
|--------|----------|------|--------|-----|-------|
| posaff | 1.000 | | | | |
| negaff | 1.000 | | | | |
| e1 | .173 | .024 | 7.192 | *** | e1_2 |
| e2 | .399 | .050 | 7.915 | *** | e2_2 |
| e3 | .153 | .022 | 6.812 | *** | e3_2 |
| e4 | .148 | .023 | 6.422 | *** | e4_2 |
| e5 | .254 | .033 | 7.595 | *** | e5_2 |
| e6 | .096 | .025 | 3.838 | *** | e6_2 |
| e7 | .442 | .054 | 8.220 | *** | e7_2 |
| e8 | .358 | .042 | 8.602 | *** | e8_2 |
| e9 | .748 | .061 | 12.307 | *** | e9_2 |
| e10 | .240 | .024 | 10.010 | *** | e10_2 |