What are the defaults for a measurement model (CFA) in Mplus?

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The default settings for a measurement model, also known as confirmatory factor analysis (CFA), in Mplus include the use of maximum likelihood estimation, a diagonal weight matrix, and default constraints on the item loadings and error variances. The model also assumes that the measurement errors are uncorrelated and that the latent factors are uncorrelated with each other. These default settings can be modified and customized according to the specific needs of the researcher.

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Let's look at an example. This example is based on example 5.1 from the Mplus User's Guide. (Note: the Mplus User's Guide, as well as all files needed to run the examples can be downloaded from the Mplus website.)

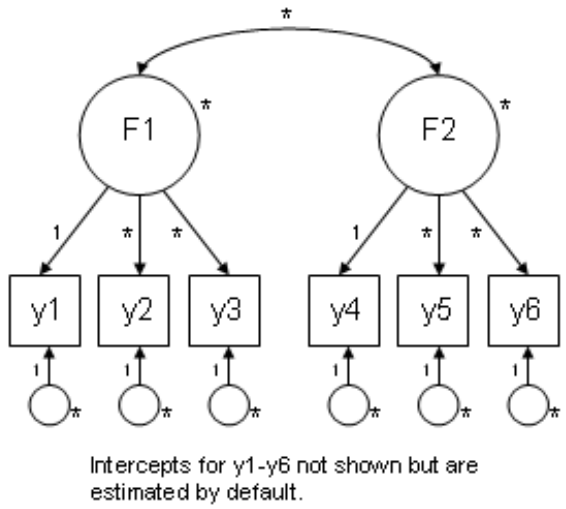
```
data: file is ex5.8.dat;
variable:
names are y1-y6 x1-x3;
usevariables are y1-y6;
model:
f1 by y1-y3;
f2 by y4-y6;
```

In the above confirmatory factor (or measurement) model we specify two latent variables f1 and f2, which

are
measured by the manifest variables y1-y3 and y4-y6 respectively. Our input file contains relatively little information about
how the model should be structured, so Mplus will apply a number of defaults to our model when we run it.

By default, Mplus does the following:

The figure below shows the model estimated by Mplus based on the input
file above and Mplus defaults. Paths with a one ("1") next to them are
constrained to one, paths with an asterisks are freely estimated. An
asterisks next to a variable indicates that variables variance is estimated.



Intercepts for y1-y6 not shown but are estimated by default.

We can confirm these defaults by looking at the output Mplus produces. For example,
under "F1 BY" we see that the factor loading for Y1 is 1.00,
confirming that Mplus did fix the first factor loading to one. We can also see
that the covariance between the two latent variables (under "F2 WITH") is -0.030, with
a standard error of 0.052, so we know that Mplus has estimated this as well.

<output omitted>

MODEL RESULTS

Two-Tailed

Estimate S.E. Est./S.E. P-Value

F1 BY

Y1 1.000 0.000 999.000 999.000

Y2 1.127 0.099 11.367 0.000

Y3 1.020 0.089 11.481 0.000

F2 BY

Y4 1.000 0.000 999.000 999.000

Y5 1.059 0.129 8.200 0.000

Y6 0.897 0.105 8.532 0.000

F2 WITH

F1 -0.030 0.052 -0.582 0.560

Intercepts

Y1 -0.022 0.063 -0.354 0.723

Y2 0.026 0.062 0.410 0.682

Y3 0.035 0.062 0.555 0.579

Y4 -0.022 0.064 -0.350 0.726

Y5 -0.016 0.058 -0.271 0.786

Y6 0.048 0.058 0.824 0.410

Variances

F1 0.907 0.125 7.253 0.000

F2 0.761 0.133 5.735 0.000

Residual Variances

Y1 1.064 0.096 11.120 0.000

Y2 0.798 0.100 7.971 0.000

Y3 1.010 0.095 10.597 0.000

Y4 1.290 0.119 10.869 0.000

Y5 0.854 0.111 7.712 0.000

Y6 1.067 0.097 11.026 0.000