**Obtaining Coefficient Omega Using M*plus***

In this document I explain how to use M*plus* to obtain coefficient omega.

The data from this study are the same as those used in the document “Confirmatory Factor Analysis Using M*plus*” and consist responses of 1022 people to items on the Achievement Goal Questionnaire (Elliot & McGregor, 2001) collected as part of a study by Finney, Pieper, and Barron (2004). Here I demonstrate calculation of coefficient omega using only the three items of the Performance Approach (perfapp) scale, but the commands below can easily be extended to more items.

The response scale ranged from 1 = not at all true of me to 7 = very true of me. There are no missing data, but I have included the “missing” command used to specify missing data in *Mplus* to demonstrate how this would be done. The data are in tab-delimited format and can be found in the file “goal orientation.dat”

**Coefficient Omega Syntax**

The syntax is based on that for the confirmatory factor analysis and repeats the commands for that analysis. I include all commands below but only comment on those that are new to this analysis.

M*plus* commands are in boldface. Non-boldface words indicate information that must be provided by the researcher for their specific data.

**Title:** coefficient omega for goal orientation data;

**Data**: **file is** goal2.dat;

**format is** free;

**Variable**: names are i1 i2 i3 i4 i5 i6 i7 i8 i9 i10 i11 i12;

**missing all** (8,9,10);

**usevariables =** i7 i8 i9;

**Model:** perfapp by i7\*(P1);

perfapp by i8-i9 (P2-P3);

i7 - i9 (P4-P6);

perfapp@1;

**Model constraint:**

**new**(omega);

omega = (P1 + P2 + P3)\*\*2/((P1+P2+P3)\*\*2+P4+P5+P6);

**Output:** **cinterval;**

The **usevariables** command selects out the three Performance Approach items. This command must be used if all the variables listed in the **variables** command are not used in the analysis.

The names specified in parentheses after each variable in the **model** command (P1, etc.) are used to provide labels for the parameters so that they can be used in subsequent calculations.

The **model constraint** commands are used to compute omega according to equation 3 in chapter 13 of the text. The **new** command indicates that a new parameter (omega) will be computed.

The specifications following **omega =** are the calculations for coefficient omega. The specification **\*\*** is used for exponentiation, so **\*\*2** specifies squaring.

The specification **cinterval** of the **output** command indicates that confidence intervals should be computed.

The CFA model with three indicators is just-identified and fit is therefore perfect. Because of this, I skip the fit index results. I show the parameters estimates for those who would like to check their understanding by computing the value of omega by hand.

MODEL RESULTS

Two-Tailed

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

PERFAPP BY

I7 0.634 0.047 13.374 0.000

I8 1.304 0.058 22.572 0.000

I9 1.205 0.059 20.429 0.000

Intercepts

I7 5.103 0.045 114.617 0.000

I8 4.135 0.047 87.938 0.000

I9 3.890 0.050 77.535 0.000

Variances

PERFAPP 1.000 0.000 999.000 999.000

Residual Variances

I7 1.624 0.077 21.133 0.000

I8 0.560 0.118 4.752 0.000

I9 1.121 0.110 10.170 0.000

New/Additional Parameters

OMEGA 0.749 0.013 56.886 0.000

The value of coefficient omega is shown as a “new parameter” above. It is calculated as:



Confidence intervals for all parameters are shown below. The 95% confidence interval for the estimate of coefficient omega is [.723, .775].

CONFIDENCE INTERVALS OF MODEL RESULTS

Lower .5% Lower 2.5% Lower 5% Estimate Upper 5% Upper 2.5% Upper .5%

PERFAPP BY

I7 0.512 0.541 0.556 0.634 0.712 0.727 0.756

I8 1.155 1.190 1.209 1.304 1.399 1.417 1.452

I9 1.053 1.089 1.108 1.205 1.302 1.320 1.357

Intercepts

I7 4.988 5.015 5.030 5.103 5.176 5.190 5.217

I8 4.014 4.043 4.058 4.135 4.212 4.227 4.256

I9 3.761 3.792 3.808 3.890 3.973 3.989 4.020

Variances

PERFAPP 1.000 1.000 1.000 1.000 1.000 1.000 1.000

Residual Variances

I7 1.426 1.473 1.497 1.624 1.750 1.774 1.821

I8 0.257 0.329 0.366 0.560 0.754 0.792 0.864

I9 0.837 0.905 0.940 1.121 1.303 1.338 1.405

New/Additional Parameters

OMEGA 0.715 0.723 0.728 0.749 0.771 0.775 0.783