

## Structural Equation Modeling

This example presents results from structural equation modeling analysis performed on a single group.

There are many measures of fit for confirmatory factor analysis and structural equation modeling. The author should provide information on several of these and may want to give a reference justifying those that are included. Each year new measures emerge as well as better understanding of the distribution of established measures. It is normally expected that the RMSEA will be included. Chi-square, the degrees of freedom, and the probability of the chi-square must always be reported. For a discussion of fit indices see

McDonald, R. P., & Ho, M.-H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7, 64 – 82.

Parameter estimates and factor loadings should be reported in a figure. Include standardized estimates, significance levels, standard errors, and the error variance of the latent constructs. For further information on design and labeling see

Nicol, A. A. M., & Pexman, P. M. (1999). *Presenting your findings: A practical guide for creating tables*. Washington, DC: American Psychological Association.

Information on writing about structural equation modeling analyses can be found in the following sources:

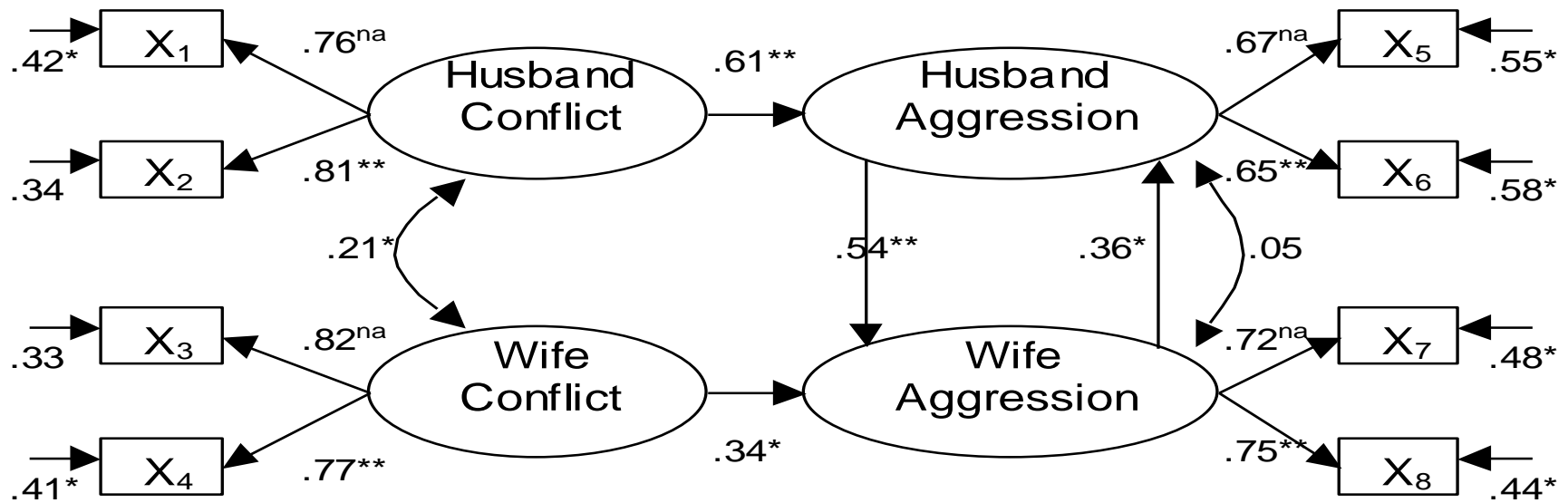
Boomsma, A. (2000). Reporting analyses of covariance structures. *Structural Equation Modeling*, 7, 461 – 483.

Hoyle, R. A., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 158 – 176). Thousand Oaks, CA: Sage.

McDonald, R. P., & Ho, M.-H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7, 64 – 82.

The example includes both a figure and a table. The figure is included to clarify the different information normally presented in figures and tables.

FIGURE 1. STRUCTURAL EQUATION MODEL OF CONFLICT IN THE FAMILY OF ORIGIN OF WIVES AND HUSBANDS AND THEIR AGGRESSIVE BEHAVIOR TOWARD ONE ANOTHER (STANDARDIZED SOLUTION;  $N = 318$ ).



X<sub>1</sub> to X<sub>4</sub> are indicators of conflicts in the husband's and wife's family of origin. X<sub>5</sub> to X<sub>8</sub> are indicators of aggression of the husband toward the wife or the wife toward the husband. Husband conflict and wife conflict are latent variables representing their history of conflict in their family of origin. Husband and wife aggression are latent variables of aggression to commit against each other.

Table 1

*Unstandardized, Standardized, and Significance Levels for Model in Figure 1 (Standard Errors in Parentheses; N = 318)*

Parameter Estimate	Unstandardized	Standardized	<i>p</i>
<b>Measurement model estimates</b>			
Husband family of origin conflict → X <sub>1</sub>	1.00	.76	Na
Husband family of origin conflict → X <sub>2</sub>	1.25 (.30)	.81	.00
Wife family of origin conflict → X <sub>3</sub>	1.00	.82	Na
Wife family of origin conflict → X <sub>4</sub>	1.22 (.41)	.77	.00
Husband aggression → X <sub>5</sub>	1.00	.67	Na
Husband aggression → X <sub>6</sub>	0.94 (.26)	.65	.00
Wife aggression → X <sub>7</sub>	1.00	.72	Na
Wife aggression → X <sub>8</sub>	1.08 (.31)	.76	.00
Error in X <sub>1</sub>	0.44 (.20)	.42	.03
Error in X <sub>2</sub>	0.29 (.21)	.34	.16
Error in X <sub>3</sub>	0.39 (.24)	.33	.10
Error in X <sub>4</sub>	0.51 (.23)	.41	.21
Error in X <sub>5</sub>	0.66 (.30)	.55	.03
Error in X <sub>6</sub>	0.68 (.32)	.58	.03
Error in X <sub>7</sub>	0.59 (.22)	.48	.01
Error in X <sub>8</sub>	0.54 (.23)	.44	.02
Covariance husband and wife conflict	0.31 (.14)	.21	.03
<b>Structural model</b>			
Husband family of origin conflict → Husband aggression	1.20 (.34)	.51	.00
Wife family of origin conflict → Wife aggression	0.84 (.40)	.34	.04
Husband aggression → Wife aggression	1.08 (.37)	.54	.00
Wife aggression → Husband aggression	1.01 (.48)	.36	.04
Residual for husband aggression	1.17 (.33)	.83	.00
Residual for wife aggression	1.21 (.55)	.81	.03
Covariance of residuals	0.44 (.68)	.05	.50

*Note:*  $\chi^2(12) = 39.18$ ,  $p < .001$ ; GFI = .94; NFI = .95; RMSEA = .05.