

Amos (Software)

MATTHEW BARNIDGE and HOMERO GIL DE ZÚÑIGA
University of Vienna, Austria

Amos (Analysis of Moment Structures) is an IBM SPSS Statistics module designed for the analysis of covariance structure models, including structural equation modeling (SEM), path analysis, and confirmatory factor analysis (CFA). It is commonly compared to other statistical applications designed for similar purposes, including Mplus and LISREL.

Amos features a user-friendly graphical interface that allows nonprogrammers to visually construct models with common online drawing tools. Rectangles represent observed variables, while circles symbolize latent variables. One-sided arrows show hypothesized cause/effect relationships, and two-sided arrows illustrate nondirectional covariances. Users can change the size of these elements and rearrange the structure of the diagram. Amos documentation (Arbuckle, 2014) provides detailed instructions for using the graphical interface, as well as interactive examples.

Amos users who prefer text-based commands can opt for the Program Editor, which accommodates the Visual Basic (VB.NET) and C# programming languages. The Program Editor makes it easier to analyze a large number of models. Amos documentation (Arbuckle, 2014) also provides more information about the Program Editor.

By default, Amos performs full information maximum likelihood estimation, but it provides options for estimation by unweighted least squares, generalized least squares, and Bayesian estimation (see below), among others. It also provides alternatives for handling missing data, including multiple imputation by regression, stochastic regression, and Bayesian methods. Although Amos was designed specifically for covariance structure models, it can perform other kinds of statistical analyses, including but not limited to multiple linear regression and analysis of variance/covariance (ANOVA/ANCOVA).

Amos features an easy-to-use interface for bootstrapping methods, which can be applied to parameter estimates, effect estimates, sample means, sample variances and covariances, correlations, model comparisons, and comparisons of estimation methods. It can accommodate nonrecursive models, models with fixed parameters, and models based on data from multiple populations. Typical output includes variable summaries, assessments of normality, model specification indices, model fit statistics, model parameters, and multiple model comparisons.

Amos contains a suite of tools for Bayesian estimation, including Markov chain Monte Carlo (MCMC) methods, multiple imputation, convergence assessment, model

diagnostics, and plotting tools. It can also accommodate nondiffuse prior distributions. The Amos documentation (Arbuckle, 2014) provides details.

Currently, Amos is only available for Windows operating systems (at the time of writing the latest version is IBM SPSS Amos 23). It can be launched as a standalone application or through SPSS, and it can read data from various file types, including but not limited to *.xls and *.sav files.

If you are affiliated with an institution of higher education, access to Amos may be provided through the library system or a computing cooperative. A student version is available through the SPSS Statistics GradPack.

For more information, see IBM's product description (<http://www-03.ibm.com/software/products/en/spss-amos>) and documentation (Arbuckle, 2014). To download Amos, see IBM's download page (<http://www-01.ibm.com/support/docview.wss?uid=swg24038593>).

Kline (2011) provides an excellent text for further reading about covariance structure models, while Byrne (2013) provides a text that focuses specifically on Amos. Albright and Park (2009) and Byrne (2001) give good comparisons of Amos with comparable statistical applications.

SEE ALSO: Bootstrapping; Causal Inference; Conditional Process Modeling (Mediation Analysis, Moderated Mediation Analysis, Moderation Analysis, and Mediated Moderation Analysis); Effect Size; Empirical and Nonempirical Methods; Experimental Design; Factor Analysis, Confirmatory; Latent Class Analysis; Mplus; Stata (Software); Structural Equation Modeling

References

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Further reading

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Matthew Barnidge (PhD, University of Wisconsin–Madison) is a postdoctoral researcher in the Department of Communication's Media Innovation Laboratory (MiLab) at the University of Vienna. His research specializes in hybrid media practices and contentious political communication.

Homero Gil de Zúñiga (PhD in politics at the Universidad Europea de Madrid and PhD in mass communication at the University of Wisconsin–Madison) holds the Medienwandel professorship at the University of Vienna, where he directs the Media Innovation Laboratory (MiLab). He also serves as research fellow at the Universidad Diego Portales, Chile and at Princeton University. His research addresses the influence of new technologies and digital media over people's daily lives, as well as the effect of such use on the overall democratic process. He has published several books and book chapters, and over 50 articles in academic peer-reviewed journals such as *Communication Research*, *Journal of Communication*, *Journal of Computer-Mediated Communication*, and *New Media & Society*.