

Resources for Learning HLM

This document is designed to help you determine whether HLM is suitable for your data analysis. Learning any statistical software involves a time investment. You should always ask before learning any new software, “What can it do for my data analysis? Can I perform the same operations in software I am familiar with?” This is especially true before you learn any specialty statistical software such as HLM.

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Decide Whether HLM is Suitable

HLM is narrowly tailored for hierarchical linear models and is not as user-friendly as general statistical packages (SPSS, Stata, etc.). You can go to HLM official website <http://www.ssicentral.com/hlm/> for more information about what hierarchical linear models can do for your research. Simply put, you data need to have a hierarchical structure in order for you to take advantage of HLM. Here we provide two examples:

- Your sample was obtained with a two-tier procedure. First, a random sample of counties was obtained from a complete county list. Second, a sample of people was obtained from the population of each sampled county. You want to estimate personal income by personal characteristics (education, gender) and county characteristics (county population and county GNP). Because of the two-tier sampling procedure, you should use 2-level hierarchical linear model to estimate personal income.
- Your data has a three-tier structure. The unit of analysis is student (level-1). Students aggregate into schools (level-2), which further aggregate into school districts (level-3). If you want to estimate student performance, you should use 3-level hierarchical linear model to control for unobserved characteristics of schools and school districts.

It is also possible to use SAS (PROC MIXED), SPSS (Linear Mixed Models), STATA (xtmixed, after release 9), or R (the lmer() functions or the BRugs package) to run hierarchical models, using xtmixed or procmixed commands. You may find that HLM is much faster for certain models, but these other programs are able to run the same models. Also note that HLM is only available for Windows.

Learning Resources

If you decide to learn HLM after determining that HLM is suitable for your data analysis purpose, here are some manuals, books, and online resources and tutorials:

Manuals

[HA29 .B845 1996 SSRC-SSDS] HLM: Hierarchical Linear and Nonlinear Modeling with the HLM/2L and HLM/3L Programs by Anthony S. Bryk, Stephen W. Raudenbush and Richard T. Congdon. Chicago: Scientific Software International Inc. 1996.

[HA29 .H655 2000 SSRC-SSDS] HLM 5: Hierarchical Linear and Nonlinear Modeling by Stephen W. Raudenbush et al. Lincolnwood, Ill.: Scientific Software Int. Inc. 2000.

Books

[HA29 .B844 1992 SSRC-SSDS] Hierarchical Linear Models: Applications and Data Analysis Methods (Advanced Quantitative Techniques in the Social Sciences by Stephen W. Raudenbush, Anthony S. Bryk. 2002. Thousand Oaks, CA: Sage Publications.

Online Resources & Tutorials

HLM website offers basic tutorials and resources as well as HLM news and program updating information:

<http://www.ssicentral.com/hlm/>

Information Technology Services at the University of Texas offers thorough descriptions of HLM and tips on setting up data properly:

<http://ssc.utexas.edu/software/software-information#hlm>

UCLA Academic Technology Services offers textbook and paper examples of HLM:

<http://www.ats.ucla.edu/stat/hlm/>

The Journal of Management provides free copies of HLM papers:

http://findarticles.com/p/articles/mi_m4256/

Statistical Analysis page on using R for mixed effects models:

<http://stats.stackexchange.com/questions/5344/how-to-choose-nlme-or-lme4-r-library-for-mixed-effects-models>

Note: This document is based on HLM 6.0 for Windows 7.

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