

Power analysis

There is a program developed by Steve Raudenbush for this purpose. The program is not documented, although the use of it is described in the paper "Raudenbush, S.W. & Liu, X. (2000). *Statistical Power and Optimal Design for Multisite Randomized trials*, *Psychological Methods*, 5(3), 199-213. The program can be obtained from the [W.T. Grant Foundation](#).

Another program, PINT, written by Tom Snijders, Roel Bosker, and Henk Guldmond can be obtained from [Tom Snijders'](#) website at <http://stat.gamma.rug.nl/snijders/> [Tom Snijders website](#). PINT is a program for Power analysis IN Two-level designs (for determination of standard errors and optimal sample sizes in multilevel designs with 2 levels). This program calculates approximate standard errors for estimated fixed effect parameters in hierarchical linear models with two levels. The formulae are derived in the publication: Snijders, T.A.B. & Bosker, R.J. (1993). *Standard errors and sample sizes for two-level research*, *Journal of Educational Statistics*, 18, 237-259. This section of the text also contains a numerical example and discussion. Chapter 10 of the same text gives a comprehensive overview of the design on multilevel studies.

Additional information can also be found in Kreft & de Leeuw (1998), Section 5.4, pp. 119 - 126. The authors discuss some few power functions and notes that the form of the function depends, among other things, on the null model. They point out that the power is the probability to reject the null hypothesis if it is not true and that the type of assumption violation, for instance, will influence the shape of the power curve. An overview of simulation studies results is also given, with some pointers as to reasonable sample sizes at the different levels.