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A new power calculator

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Rory Allen and **Ian Hannent** on a new computerised tool

Power is an important concept in statistics, if only for the very practical reason that many grant-giving bodies now require a minimum power of 80 per cent to be built into the design of any study eligible for funding. At the same time, though the idea is essentially quite simple, standard textbooks often make the calculations appear mysterious. The provision of computer programs or tables to enable the necessary calculations, though functional, provides no insight into what is going on.

The development of a visual aid or 'nomogram' by Douglas Altman was a major step forward, making the calculation – at least for a typical independent groups scenario – almost instantaneous. But Altman's version used only two alpha levels (both 2-tailed), and given the design, the use of even two levels made the diagram somewhat overcrowded. Moreover, it provided no insights into the underlying principles on which it operated.

It seemed to us that it might be useful to develop an approach to power calculations that overcame these difficulties. It should be sufficiently versatile to accommodate some flexibility over alpha values, but should also be of value heuristically. It would need to be self-explanatory enough to enable researchers to use it as a quick and easy sample size calculator, but would also allow students to get to grips with the power concept by experimenting with different combinations of the four variables alpha, effect size, sample size and power, thus gaining the confidence that can only be acquired by hands-on familiarity.

This program is now available on www.paidresearch.org/powercalculator. We hope that the program, along with the accompanying quick guide and more detailed explanation of principle, will be helpful to researchers, and useful as a means of desensitising students to a concept that is as theoretically interesting as it is practically useful.

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