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Individual Responses Made Easy

Will G Hopkins, Institute for Sport Exercise and Active Living, Victoria University, Melbourne, Australia. **Email**. Reviewer: Alan M Batterham, School of Health and Social Care, University of Teesside, Middlesbrough, UK. Sportscience 19, i, 2015 (sportsci.org/2015/inbrief.htm#IndivResp). Published June 2015. ©2015

After reviewing a manuscript for the Journal of Applied Physiology, I was invited to write an editorial on individual responses. The editorial is available from [this link](#). JAP does not publish abstracts for its editorials, so here is the one I wrote…

This editorial is a commentary on a co-published article about statistical issues in the quantification of individual responses to an intervention in a controlled trial. The editorial provides a simpler approach to understanding and estimating individual responses, which can be summarized as a standard deviation derived from the change scores in intervention and control groups. Formulae for the standard deviation and its confidence limits are presented. Researchers should investigate potential moderators and mediators of the treatment by examining plots of change scores of the dependent variable against relevant subject characteristics and change scores of subject states. When included as covariates in the analysis, moderators and mediators account for individual responses by reducing their magnitude. The editorial ends with a recommendation for presentation and analysis of group means and standard deviations of change scores in all reports of controlled trials.

Exceptional Case Studies

Will G Hopkins, Institute for Sport Exercise and Active Living, Victoria University, Melbourne, Australia. **Email**. Reviewer: Alan M Batterham, School of Health and Social Care, University of Teesside, Middlesbrough, UK. Sportscience 19, i, 2015 (sportsci.org/2015/inbrief.htm#CaseStudies). Published June 2015. ©2015

In another editorial for the Journal of Applied Physiology I dealt with the issue of quantifying the extreme level of the physiology of talented athletes, to accompany an article on a world-champion athlete in the same issue of the journal. The editorial is available from [this link](#). This time I wrote the abstract into the editorial, but I also submitted it separately, on the off-chance it would get published. Sure enough, it's there...

Authors reporting physiological measures of an exceptionally talented individual should provide standard deviations as well as means of the measures in an appropriate normal population group. With reasonable assumptions, the individual's values can be converted to percentile scores, which allow some quantitative assessment of the extent to which the physiology accounts for the exceptional talent.

More Mixed Modeling with SPSS

Will G Hopkins, Institute for Sport Exercise and Active Living, Victoria University, Melbourne, Australia. **Email**. Reviewer: Alan M Batterham, School of Health and Social Care, University of Teesside, Middlesbrough, UK. Sportscience 19, i-ii, 2015 (sportsci.org/2015/inbrief.htm#MixedSPSS). Published June 2015. ©2015

I recently gave two workshops to a small group of PhDs and supervisors at the sport university in Oslo (NIH) on the use of SPSS to do mixed modeling. I used it as an excuse to develop two spreadsheets for reliability analyses that could be checked with mixed models, which would be straightforward pure random-effects models to start with, but could then lead to more interesting mixtures of random and fixed effects. The reliability analyses are ex-

plained in another article on validity and reliability in this issue. An Excel dataset and a Word doc with screen shots explaining how to do the one-way and two-way reliability analyses have now been added to the Zip-compressed file (published in the Sad Stats In-brief item in 2006) that already had some tips and tricks for various analysis with SPSS.

The Zip file contained a standard approach to analysis of a controlled trial, in which the pre and post measurements in the two groups are modeled as such. You will now also find another Excel spreadsheet and Word doc explaining how to analyze a controlled trial in SPSS using change scores as the dependent variable. It contains the same special trick of interacting a dummy variable with the subject random effect to estimate individual responses to the treatment. Of course, you can estimate individual responses with my controlled-trial spreadsheet (I have included it in the Zip file), but you are limited to only one covariate as a modifier of the treatment effect with my spreadsheets. With SPSS or other package, you get to include more than one. Don't use the R package, though, because the progenitor of the mixed model in R, Doug Bates, refuses to add a standard error to the estimates of the random-effect variances. So you can get individual responses as a standard deviation with R, but you have no idea of the precision of the estimate.

In summary, here are the files in the Zip-compressed file for mixed and other modeling with SPSS…

The original files

   Tips for SPSS.doc: an explanation of various analyses.

   multiliner for mixed.xls: a dataset for doing the usual mixed model.

   multiliner for mixed.sav: the corresponding SPSS dataset. No real need for this.

   mixed model output.spv: the output of the mixed modeling. No need for this either.

The new reliability files

   SPSS_Rely_Mixed_Model.docx: how to do the one- and two-way reliability analyses with the mixed model in SPSS.

   SPSS_Rely_Mixed_Model.xlsx: spreadsheets with the analyses and with a dataset in long form to import into SPSS for mixed modeling.

The new controlled-trial files

   controlled trial in SPSS.docx: how to analyze a controlled trial with the mixed model in SPSS using change scores.

   controlled trial in SPSS.xlsx: the dataset to import into SPSS.

   xParallelGroupsTrial.xls: the Sportscience spreadsheet with the same data, annotated a little for comparison with the SPSS analysis.

"The Intervention is Possibly Beneficial (and most unlikely harmful)"

Will G Hopkins, **Alan M Batterham**. Institute for Sport Exercise and Active Living, Victoria University, Melbourne, Australia; School of Health and Social Care, University of Teesside, Middlesbrough, UK. **Email**. Sportscience 19, ii, 2015 (sportsci.org/2015/inbrief.htm#MBI). Published Sept 2015. ©2015

The title of this item was the way Alan Batterham and I introduced a short article on a "hot topic in statistics" we were invited to contribute to the Autumn issue of *The Sport and Exercise Scientist*, the quarterly magazine of the British Association of Sport and Exercise Sciences. The issue went live for members of BASES recently, so we can now make it available here.

The point of the title is, of course, that it's the kind of outcome you can get with magnitude-based inference and the kind of outcome that allows you to make properly informed clinical decisions, but it's NOT the kind of outcome you get with null-hypothesis significance testing. To read the article (~1000 words), click here.

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