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Journal CiteScores 2021: citation metrics from the Scopus database

Will G Hopkins, Institute for Health and Sport, Victoria University, Melbourne, Australia. Email. Sportscience 26, i, 2022 (sportsci.org/2022/inbrief.htm#citescores. Reviewer: Catherine Bacon, School of Nursing, University of Auckland, Auckland NZ. Published July 2022.

Download a workbook of the current year (2021) of CiteScores from Elsevier's Scopus site for journals in sport and exercise medicine and science. Please email me with any journal titles I have missed and I will update the workbook.

This year Elsevier has provided only the current CiteScores, so if you want to see how a particular journal is trending, you will have to open last year's spreadsheet to see the scores for 2019 and 2020. Last year's In-brief item provides an explanation of the CiteScore and a comparison with the traditional impact factor.

There has been no change at the top since last year: *International Review of Sport and Exercise Psychology* on 27 is well ahead of *British Journal of Sports Medicine* on 21, with *Sports Medicine* close behind on 20. *Frontiers in Sports and Active Living* has made its first appearance with a disappointing 0.7, but *Frontiers in Physiology* is doing well on 6.6. Other journals with scores ≥6.0 include:

Journal of Sport and Health Science 11
Exercise and Sport Sciences Reviews 10
American Journal of Sports Medicine 9.8
Int J Sport Nutrition Exercise Metabolism 9.6
Med Sci Sports and Exercise 8.6
J Int Society of Sports Nutrition 8.4
Scandinavian J Med Sci Sports 7.6
Journal Science Medicine in Sport 7.4
Research in Sports Medicine 7.2
Sports Medicine – Open 7.0
European Journal of Sport Science 6.9
Psychology of Sport and Exercise 6.7
Int J Sports Physiology Performance 6.3
Int J Sport Exercise Psychology 6.2
Journal of Sports Sciences 6.0
J Strength and Conditioning Research 6.0.

Replacing Statistical Significance…: the back Story

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Sportscience 26, i-ii, 2022 (sportsci.org/2022/inbrief.htm#sbackstory. Reviewer: Ken Quarrie, Rugby New Zealand, Wellington, NZ. Published Sept 2022.

Update 7 Sept. Another important omission in the Frontiers article (and the previous discussion paper) is the issue of values for the smallest important effect, which you will need when using any of the three methods replacing statistical significance. The article on magnitude-based decisions as hypothesis tests has a section on magnitude scales in the Appendix, where the smallest and other important magnitudes I use are described for all the usual kinds of effect. In particular, note that for changes (or differences) in means, standardization with the appropriate between-subject standard deviation should be used only when there is no known relationship between the changes in the mean and performance, wealth or health in the population of interest. Otherwise work out the smallest important change in the mean associated with the (known) smallest important change in performance, wealth or health.

Last year I circulated a discussion paper on sampling uncertainty to 32 editors of journals specializing in exercise and sport science and medicine. Sixteen editors didn't reply, two replied negatively, one was ambivalent, seven said they would look into it, and six were quite positive. Of the six, two (the editors of *Frontiers in*

Physiology and *Frontiers in Sports and Active Living*) invited me to submit an updated version as a perspectives article. After many rounds of reviewing, the much augmented article has now been published in *Frontiers in Physiology* and is reproduced in this issue of *Sportscience*.I wrote the article primarily to provide researchers with three alternatives to nil-hypothesis significance testing (NHST), and to show that the alternatives are effectively equivalent and better than NHST. I also wanted to show that magnitude-based inference (MBI) is consistent with the three alternatives.

Some journal editors may nevertheless dismiss the article and insist on the use of NHST. If you understand that NHST provides misleading conclusions about effect magnitudes, I suggest you check the author guidelines of other journals to find one that allows you to deal with sampling uncertainty using one or more of the alternatives. You can refer to MBI for the interpretation of probabilities of the magnitude of the true effect, if the journal allows it. I have also been using the term *magnitude-based decisions* (MBD), since I first demonstrated the equivalence of MBI with hypothesis tests, and since Sander Greenland disapproved of the use of *inference* for anything other than an analysis that accounts for all the assumptions in the sampling and modeling. You can never achieve such an analysis, so it would seem that you can never use the term *inference*, yet it's a reasonable term to refer to what we do when we deal with sampling uncertainty. I am therefore using magnitude-based *inference* again.

The article demonstrating the equivalence of MBI with hypothesis tests included the following important point that did not make it into the current *Frontiers* article. Use of the term *unclear* to describe an effect seems reasonable when no hypotheses are rejected, but if effects are otherwise described as *clear*, some researchers may end up deciding that a possibly or likely substantial (or trivial) effect is clearly substantial (or trivial), which of course it isn't. *Adequate precision* or *acceptable uncertainty* are better terms than *clear* to describe such effects. Researchers should refer to a clearly substantial (or trivial) effect only when the effect is very likely or most likely substantial (or trivial).

For those who wish to present the chances of substantial and trivial magnitudes (or p values for the hypothesis tests derived therefrom), I have added a decimal place to the chances in all the spreadsheets at this site that have MBI. Show the extra significant digit only when chances are <1% or p<0.01 and >99% or p>0.99; for example, 0.4% or p=0.004, 99.7% or p=0.997, and 67% or p=0.67, but not 67.3% or p=0.673.

I have also added cells to the Bayesian spreadsheet to convert the posterior provided by a full Bayesian analysis (i.e., an analysis using informative priors for all the parameters in the statistical model) into a single prior uncertainty in the true effect, the prior promoted by Sander Greenland. I made these additions to demonstrate that Greenland's approach with this single prior is indeed Bayesian, because it gives a posterior equivalent to that of a full Bayesian analysis. The spreadsheet should also be useful for anyone who has done a full Bayesian analysis with default or other priors, because they can then derive the easily interpreted Greenland prior and thereby check whether all those individual priors coalesce into something realistic.

Mixed-modeling Workshop in SAS Studio: updated for SAS OnDemand for Academics

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Sportscience 26, ii-iii, 2022 (sportsci.org/2022/inbrief.htm#workshop. Reviewer: Hongyou LIU, School of Physical Education and Sports Science, South China Normal University. Published Oct 22. ©2022

[For links to understanding mixed modeling, view this item. The mixed-model workshop accessed below includes an introduction to mixed modeling.]

In 2021 the Statistical Analysis System became available for free as **SAS Studio**, running in the cloud within SAS OnDemand for Academics (ODA), as reported in an In-brief item at this site. I have now updated my workshop suite of materials for doing mixed modeling with SAS, so that the instructions for getting started are consistent with SAS Studio ODA. Download the 11.9 MB zip-compressed file of workshop materials. Put the zipped file where you want the package to reside on your computer, right-click on the file and select Extract All. Open the file `Read me first.docx` and follow the instructions therein.

The workshop is also available for the **SPSS package** here. SPSS has a friendlier interface for those who prefer to point and click rather than write code, but for complex models you have to write code, and SAS is way better for that, especially for prior manipulation of data. SPSS is not as powerful as SAS for mixed models: when I last looked some years ago, SPSS did not allow separate random-effect variances for different levels of a group variable, and it did not allow negative variance. However SPSS does estimate standard errors for the variances, so you can get compatibility limits–the same as those in SAS–by making the assumption of normality for the sampling distribution of the variance. These limits are more realistic for random effects than those based on the chi-squared distribution, even if the lower limit is sometimes negative. Compatibility limits for the residuals are always given by the chi-squared distribution.

Finally, the old brief resource for getting started with mixed modeling in the **R package** is still available here, as provided by Alice Sweeting (where you can contact her with any questions about R). R is even less powerful than SPSS, because it doesn't provide estimates of the variances' standard errors. Alice and I tried someone's code for generating the standard errors, but the estimates differed from those of SAS.

Top-cited Sport Scientists 2021: Elsevier's rankings

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Sportscience 26, iii-iv, 2022 (sportsci.org/2022/inbrief.htm#topsportsci. Reviewer: Will Hopkins, Institute for Health and Sport, Victoria University, Melbourne, Australia. Published Oct 22.

Update 7 Nov. The Shanghai ranking of universities for sport science is now included below.

For the last few years, Elsevier has been compiling citation scores for all researchers based on citations to articles authored or co-authored by the researchers. Elsevier has also compiled similar scores for all citations to researchers throughout their careers. A description of the method, the scores, and the resulting rankings for the most recent full year (2021) are now available at this Elsevier site. John Ioannidis of Stanford University is mentioned as the "contributor".

Quoting from the Elsevier site: "Calculations were performed using all Scopus author profiles as of September 1, 2022. If an author is not on the list, it is simply because the composite indicator value was not high enough to appear on the list. It does not mean that the author does not do good work… The c-score [used to rank authors] focuses on impact (citations) rather than productivity (number of publications) and it also incorporates information on co-authorship and author positions (single, first, last author)." There are two c-scores: one that excludes self-citations and one that includes them. The spreadsheets download already sorted by the rank that excludes self-citations.

The rankings for all research fields are in large spreadsheets (~80 MB) showing the top 2% of all scientists in each field. Much smaller spreadsheets limited to sport scientists and with most of the data fields hidden are available here for the 2021 ranking and the career-long ranking. Here are the top 10 in each spreadsheet:

Ranking 2021	no self-cites	with self-cites
Hopkins, William G.	1	2
Borg, G. A.V.	2	5
Bahr, Roald	3	1
Gabbett, Tim	4	4
Phillips, Stuart M.	5	3
Buchheit, Martin	6	7
Burke, Louise	7	6
Smith, Brett	8	9
Malina, Robert M.	9	8
Jeukendrup, Asker E.	10	10

Career ranking	no self-cites	with self-cites
Noakes, Timothy D.	1	2
Shephard, Roy J.	2	5
Kraemer, William J.	3	1
Hopkins, William G.	4	4
Nieman, David C.	5	3
Phillips, Stuart M.	6	7
Malina, Robert M.	7	6
Komi, Paavo V	8	9
Kjær, Michael	9	8
Borg, G. A.V.	10	10

Elsevier's citation metrics are used by TopUniversities.com to rank universities. View the methodology here, and the 2022 ranking for sport-related subjects here. The top 10 universities for sport (1st to 10th) are Loughborough, Queensland, British Columbia, Sydney, Toronto, Deakin, Birmingham, Bath, Liverpool John Moores, and Melbourne. Times

Higher Education also uses Elsevier metrics to rank universities, but the ranking is heavily weighted by UN sustainable development goals, and there is no option to subset the ranking to sport-related subjects.

The Shanghai ranking of universities offering sport science is somewhat different from that of TopUniversities.com: the top 10 (1st to 10th) are Deakin, Norwegian School of Sport Sciences, Copenhagen, Verona, Loughborough, Vrije Universiteit Amsterdam, Queensland, Jyväskylä, Victoria Melbourne, and Calgary. The TopUniversity ranking includes a heavy weighting for "reputation" based on surveys of academics, while the Shanghai ranking is based only on publication metrics.

The Future of this Site: a call for expressions of interest

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Sportscience 26, iv, 2022 (sportsci.org/2022/inbrief.htm#site. Published Dec 2022.

My part-time contract at Victoria University in Melbourne has come to an end. I would be happy to work part-time with an institution for another year or two, especially if there is an individual or group within the institution who could take over the Sportscience site. Possible new developments at the site include extending it to exercise generally and adding resources for machine learning. If interested, please email me.