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Possible research area bias in the Excellence in Research for Australia (ERA) draft journal rankings

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Abstract
An analysis of the Excellence in Research for Australia (ERA) draft rankings of 661 psychology journals points to systematic differences between research areas in the distribution of ranks. Journals in experimental, biological and neuroscientific psychology obtained higher mean ranks, consistent with a tendency for ''hard-science'' areas to have higher bibliometric journal impact. The ERA will influence the distribution of resources and rewards within psychology and create powerful incentives for institutions and researchers, so differences in ranks across research areas may alter the shape of the discipline. Although they do not necessarily imply bias, such differences raise the possibility that psychology researchers will not operate on a level playing field.

Keywords: *Discipline issues, national development of psychology, psychology as a discipline*

The Australian Research Council's Excellence in Research for Australia (ERA) initiative will overhaul how the nation's research output is evaluated, much as the United Kingdom's Research Assessment Exercise (RAE) has done. Its main component is a ranking of journals in each field of study according to prestige, taken as a proxy for the quality of the work that they publish. Journals of the highest standing receive an A* and less prestigious journals are ranked A, B or C. Final rankings have been published for several fields, and draft rankings have been circulated in others, including psychology.

ERA rankings will have a major impact on how universities, departments and researchers are financially and reputationally rewarded. Funding and status will flow to institutions whose publications tend to appear in high-ranking journals. Researchers who publish in these journals will enjoy enhanced prospects for promotion and funding. The rankings will therefore create powerful incentives for researchers to target high-ranking journals and for departments to hire and direct resources towards researchers who do so successfully. For these incentives to be effective in promoting quality research it is vital that the rankings capture journal quality validly and fairly.

This task is difficult in a diverse field such as psychology. Research and publication practices in the ''softer'' areas of the discipline lean towards the social sciences, whereas ''harder'' areas lean towards the biosciences. This soft–hard dimension is reflected in citation-based indices of journal quality, such as the impact factor (IF), with journals in harder fields tending to have higher IFs. According to the Web of Science (WoS) database the median 2008 IFs of journals in psychology's cognate softer disciplines (anthropology, 0.62; political science, 0.65; sociology, 0.75) are much lower than those in its cognate harder disciplines (psychiatry, 1.77; physiology, 2.23; neurosciences, 2.63). Psychology's subdisciplines vary widely on the same continuum, from psychoanalysis (0.50) to biological psychology (2.21). IFs are controversial indices for assessing journals (Shewchuk, O'Connor, Williams, & Savage, 2006; van Leeuwen & Moed, 2001), but they closely track prestige within fields and differences in hardness between fields.

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If journals in psychology's subdisciplines tend to differ on bibliometric indices, a system for ranking journals based on impact may tend to rank journals higher in some subdisciplines than others. Such differences in ranks across subdisciplines could represent a bias in the ranking system. If the ERA ranking gives systematically higher ranks to journals in a subdiscipline, researchers in that subdiscipline will be advantaged. Over time, such advantages may influence the distribution of resources, status and researchers within the field.

We examined whether the draft ERA journal rankings contain a possible research area bias, predicting that journals in the harder areas of the discipline (e.g., biological, neuroscientific, experimental) would tend to receive higher ERA ranks. We also predicted that the rank advantage of these fields would be at least partially explained by their higher scores on bibliometric indices, understood as proxies for hardness.

Method

The 661 journals in the draft psychology ERA rankings were examined for overlap with the WoS database of scientific journals. IFs, 5-year IFs and article influence scores (AISs: a new index assessing journal influence) (Bergstrom, West, & Wiseman, 2008) for 2008 were extracted for the 434 journals covered in the database (and for two journals that had a 2007 IF but not a 2008 IF). Their research area classification in the database (''applied'', ''biological'', ''clinical'', ''developmental'', ''educational'', ''experimental'', ''mathematical'', ''multidisciplinary'', ''psychoanalytic'', ''social'') was noted. These classifications were not mutually exclusive: 49 journals were classified in more than one research area and 38 journals were not classified in any area. After consulting these classifications, two researchers independently coded the remaining 225 journals for the same 10 categories, generally showing good reliability (Cohen's $\kappa = 0.51$–1.00; median $= 0.71$), and journals were assigned to a research area category when both coders agreed. Two additional categories were also recorded for all 661 journals: ''neuroscientific'' (indicated by ''neuro'' or ''brain'' in the title) and ''Australian'' (indicated by its presence in the title).

Results

Analyses were conducted separately for the 434 WoS journals, which had bibliometric indices and database-assigned research area classifications, and for all 661 journals, 225 of which had no bibliometric indices and coder-assigned research areas. IFs, 5-year IFs and AISs for the WoS journals were positively skewed and thus subjected to square-root transformations. The transformed indices correlated very strongly (rs $= 0.90$–0.96). ERA ranks for the 661 journals were converted into numerical scores (A$\star$ = 4, A = 3, B = 2, C = 1). The three indices correlated strongly with journal rank ($r = 0.73$ [IF], 0.77 [5-year IF], 0.75 [AIS]), indicating that the ERA ranking mirrors citation impact. Journals ranked A$\star$, A, B and C had mean IFs (untransformed) of 4.70, 2.44, 1.28 and 0.68, respectively. Journals not covered by WoS were ranked lower than those covered (mean score 1.17 vs. 2.20), $t(659) = 15.48$, $p < .001$, indicating that they tend to be less prominent.

Figure 1 summarises the distribution of ranks across subdisciplines for the WoS journals. High-ranking (A$\star$/A) journals are much more prevalent in neuroscientific (69.6%), experimental (60.0%), mathematical (60.0%) and biological psychology (50.0%) than in other subdisciplines, which range from 8.0% (psychoanalysis) to 36.4% (developmental). Table I presents mean rank scores for journals in each area and in the two additional classifications. The difference between journals in each classification and all remaining journals was compared using Mann–Whitney tests. For the 434 WoS journals, ANCOVAs were conducted for each classification with journal IF as a covariate, and the significance of the classification effect after controlling for IF is reported. Identical analyses conducted using 5-year IF and AIS as covariates yielded the same findings, so only the IF-based analyses are presented.

Table I shows that journals in biological, experimental and neuroscientific psychology received significantly higher ranks than other journals, although the effect for biological journals was obtained only in WoS journals. The rank advantage of the biological and neuroscientific subdisciplines disappeared when their IFs were statistically controlled, but the relatively high rank of experimental psychology journals persisted. In contrast, psychoanalytic and multidisciplinary journals tended to receive low ranks, although the former effect was not

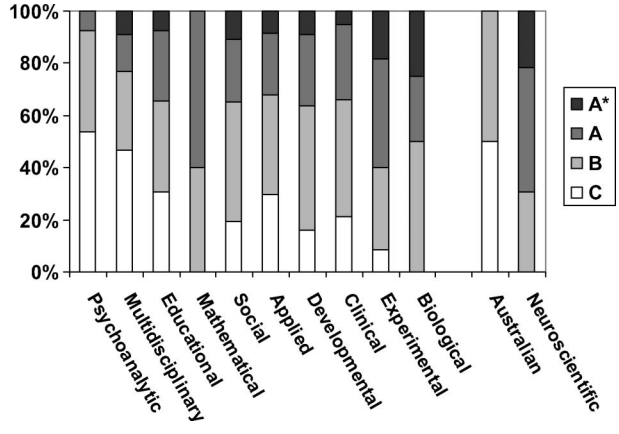


Figure 1. Distribution of rankings for the 434 Web of Science journals in different research areas

Table I. Mean rank scores vs. subdiscipline

	Web of Science journals			All journals	
	N	Mean (SD) rank score	Controlling for IF	*N*	Mean (SD) rank score
Applied	47	2.11 (0.94)	*ns*	69	1.81 (0.93)
Biological	12	2.75 (0.87)*	*ns*	24	2.17 (1.09)
Clinical	80	2.18 (0.82)	*ns*	121	1.81 (0.87)
Developmental	44	2.30 (0.85)	*ns*	58	2.02 (0.91)
Educational	26	2.12 (0.95)	*ns*	41	1.78 (0.91)
Experimental	60	2.70 (0.87)**	**	73	2.45 (1.00)**
Mathematical	5	2.60 (0.55)	*ns*	7	2.14 (0.90)
Multidisciplinary	90	1.86 (0.98)**	*	121	1.67 (0.93)*
Psychoanalytic	13	1.54 (0.66)**	*ns*	17	1.41 (0.62)
Social	46	2.26 (0.91)	*ns*	58	2.02 (0.95)
Neuroscientific	23	2.91 (0.73)**	*ns*	34	2.38 (1.10)**
Australian	2	1.50 (0.71)	*ns*	12	1.17 (0.39)**
All journals	434	2.20 (0.94)	–	661	1.85 (0.95)

Notes. IF = impact factor.
*$p < .05$, **$p < .01$.

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significant in the full journal sample. The rank disadvantage of multidisciplinary journals remained after their relatively low IFs were controlled. Journals with an Australian focus also received low ranks, significantly so in the full sample: none of the 12 were ranked A or A*.

The mean ERA rank of the 10 WoS research areas was strongly correlated with the median 2008 IF of journals in those areas (Spearman $\rho = 0.82$). By implication, the ERA rankings closely track the hardness of research areas.

Discussion

Our analysis indicates that journal ranks in the draft ERA list are unevenly distributed across research areas. As predicted, journals in traditionally hard-science areas tend to receive higher ranks than those in other areas. For journals in the biological and neuroscientific areas this effect was explained by their relatively high IFs, an indicator of their hardness. The rank advantage for experimental psychology journals remains even after their relatively high IFs are taken into account, suggesting that it is not reducible to hardness but involves additional factors (e.g., historical prestige).

The advantaged status of experimental, biological and neuroscientific psychology in the ERA draft rankings could have significant consequences. Researchers in these areas would have a greater likelihood of publishing in high-ranking journals than their peers in other fields, improving their prospects for funding and promotion. Departments would have an incentive to hire and support staff in these areas to improve their ERA profile. Research students would be drawn towards these areas at the expense of others. Similarly, if multidisciplinary and Australian journals are ranked low, researchers may be dissuaded from conducting work that is integrative or has primarily local relevance.

It is not self-evident that the present findings indicate a problematic bias. It could be argued that journals in some areas should tend to be ranked higher than others because the average quality of the work they publish is objectively higher. Similarly, it could be argued that research in some areas is more successful, more likely to yield future advances or more strategically important and that it is therefore reasonable to channel scarce resources in their direction via the ERA rankings. Although an even distribution of ERA rankings across research areas might seem to be a fair one, other things being equal, there may be good reasons why the playing field should not be level in this manner. Nevertheless, it is important that the unevenness of the present distribution – which allocates high rankings (A*/A) to journals in biological, experimental and neuroscientific psychology at almost twice the rate as to those in applied, clinical, developmental, educational and social psychology – is recognised, justified and, if necessary, corrected.

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