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LETTER TO THE EDITOR

Seasonal bias in editorial decisions? A study using data from chemistry

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In a recent paper in *Learned Publishing*, Shalvi, Baas, Handgraaf, and De Dreu examined whether the time point of the submission of a paper to a journal affects the probability of its publication,[1] exploring 'whether an additional and somewhat arbitrary factor, the seasonal overloading of editorial desks caused by the amount of submitted work, influences the likelihood of acceptance' (p. 118). To answer this question of a seasonal bias in editorial decisions they used the data on all papers published between 2003 and 2006 in the journals *Psychological Science* (*PS*) and *Personality and Social Psychology Bulletin* (*PSPB*). Their analysis of the data yielded different results for the two journals:[1]

> Contributors to *PS* submit more during the summer months but accepted papers are submitted equally throughout the year. Thus, in the summer contributors create their own entrance barrier. Interestingly, different patterns were observed between the two leading psychology journals that were studied, *PS* and *PSPB*. While a discrepancy between the pattern of submission-per-month and acceptance-per-month is found at *PS*, this does not occur at *PSPB*. (p. 121)

Hartley[2] criticized Shalvi *et al.*'s study for the overgeneralization from their results. Their recommendation to authors to submit papers in the winter when less competition existed is based on only one journal. Hartley's[2] own analyses of small submission samples from two anonymized journals did not confirm a seasonal bias in editorial decisions. According to Hartley,[2] more supporting data are needed to sustain the notion. In a reply to Hartley,[2] Shalvi *et al.*[3] agreed that more research is needed. In a comprehensive research project we investigated the peer-review process of the journal *Angewandte Chemie International Edition* (*AC-IE*).[4–6] *AC-IE* is one of the prime chemistry journals in the world, with a high submission rate and with a higher annual Journal Impact Factor (JIF, provided by Thomson Reuters) than the JIFs of comparable journals (12.730 in the 2010 *Journal Citation Reports: Science Edition*, Institute for Scientific Information).

Based on our *AC-IE* database we can take up Shalvi *et al.*'s[1] question and examine to what extent there may be a seasonal bias at *AC-IE*. Our dataset is even better suited for examination of seasonal bias in editorial decisions than the data used by Shalvi *et al.*, for the following reasons. (1) Our study includes not only manuscripts that were accepted and published by the journal but also manuscripts that were rejected (and were later published elsewhere). Only when both groups (accepted and rejected manuscripts) are included is it in fact possible to test whether the date of submission has an influence on the journal's decision to accept a manuscript. (2) When investigating a bias in editorial decisions, any bias due to differences in the quality of the submissions should be excluded as far as possible. It is possible that the variation in seasonal likelihood of acceptance for publication found by Shalvi *et al.* is due to differences in the quality of the submissions.[7]

Due to a lack of other operationalizable indicators, it is common in research evaluation to use citation counts as an indicator of scientific quality. In the present study we retrieved citation counts for manuscripts accepted by *AC-IE* or rejected and published elsewhere for a fixed time window of three years after the publication year. The cita-

Table 1. Number of manuscripts submitted to *AC-IE* in different months

Month	No. of manuscripts
January	131
February	163
March	140
April	122
May	147
June	162
July	178
August	172
September	135
October	143
November	169
December	120
Total	1782

tion analyses for this study were conducted based on Chemical Abstracts (CA) (Chemical Abstracts Services, Columbus, OH, USA). CA is a comprehensive database of publicly disclosed research in chemistry and related sciences (see http://www.cas.org/). As the citation counts were captured *ex post* – i.e. after the editors' publication decisions (at *AC-IE* or another journal) – they are included in the statistical analyses only as control variables. This means that in the analysis the point of interest was *not* the correlation between citation counts and editorial decisions but instead the correlation between the bias variable (submission date) and acceptance decisions, when manuscript impact is statistically controlled.

A manuscript submitted to *AC-IE* usually undergoes internal and external review. First, the editors at *AC-IE* evaluate whether the manuscript contributes to the development of an important area of research (internal review). If the journal editors find that this is so, they send the submitted manuscript to several independent reviewers, who review it using an evaluation form and a comment sheet (external review).[8] The journal editors make the decision to accept or reject a manuscript for publication on the basis of these reviews and their own evaluations.[6,9] For investigation of the *AC-IE* peer-review process, information is available on a total of 1,899 manuscripts reviewed in the year 2000 (the journal published 24 issues in the year 2000). The information was drawn from material in the archives of the journal's publishing house, Wiley-VCH. Based on the external reviews, 46% (n = 878) of the 1,899 manuscripts were accepted for publication in AC-IE, and 54% (n = 1,021) were rejected. Research in the literature databases Web of Science (Thomson Reuters, Philadelphia, PA, USA) and CA revealed that 959 (94%) of the 1,021 rejected manuscripts were later published in other journals in a more or less revised form.[4,5,10,11]

In this study we included all manuscripts that were submitted to *AC-IE* in the year 2000 (date of the original submission; n = 1,782; 117 manuscripts were submitted in 1999). Table 1 shows the distribution of the manuscript submissions over the months of the year. In agreement with the findings by Shalvi *et al.*,[1] but in disagreement with the results of Hartley[2] for three anonymized journals, comparatively many manuscripts were submitted to *AC-IE* during June and August. However, submission rates were also high in February and November.

For the analyses of the editors' decisions on acceptance or rejection of manuscripts, a logistic regression model was calculated.[12] The dependent variable – editors' decision – has the value 0 for negative outcome (reject for publication) and the value 1 for positive outcome (accept for publication). Table 2 shows the results of the regression analysis. In both the model that did not include citation impact and the model that included citation impact there was a statistically non-significant association between number of submissions in a month and the likelihood of a manuscript's acceptance for publication.

Thus, these findings for the chemistry journal *AC-IE* replicate Shalvi *et al.*'s negative results for *PSPB*[1] and Hartley's[2] results for two anonymized journals. Hence for four journals (*PSPB*, two anonymised journals, and *AC-IE*) there are no indications of a seasonal bias in editorial decisions. However, Shalvi *et al.* did find indications of a seasonal bias for *PS*. To be able to make a generally valid statement about the effect of this bias type, it will be

Table 2. Logistic regression model predicting decisions on manuscripts submitted to AC-IE

Variable	Model 1: without citation impact	Model 2: including citation impact
Number of submissions per month	–0.00153 (–0.61)	–0.00119 (–0.45)
Citation impact (measured *ex post* as control variable for scientific quality of the submission)		0.0408*** (8.93)
Intercept	0.0373 (0.10)	–0.509 (–1.26)
N	1782	1702

Notes: t statistics in parentheses.
***$P < 0.001$.
Fewer manuscripts could be included in model 2 than in model 1, because citation counts are not available for all submissions.

necessary to examine yet further journals with regard to seasonal bias. But these studies should control for the quality of the submissions, and both accepted and rejected submissions should be included in the analyses.

In general a journal's process should be studied continuously and any evidence of seasonal bias in judgement should be brought to the attention of the editor, for correction and modification of the process.[13] For Hojat, Gonnella, and Caelleigh[14] it is necessary 'that the journal editors conduct periodic internal and external evaluations of their journals' peer review process and outcomes' (p. 75) to assure its integrity and fairness. In the case of international journals (such as the *AC-IE*), submission rates per month should be analysed according to the geographic hemisphere of the submitting authors (southern or northern hemisphere).

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References

1. Shalvi, S., Baas, M., Handgraaf, M.J.J., and De Dreu, C.K.W. 2010. Write when hot – submit when not: seasonal bias in peer review or acceptance? *Learned Publishing*, 23: 117–123. http://dx.doi.org/10.1087/20100206.
2. Hartley, J. 2011. Write when you can and submit when you are ready! *Learned Publishing*, 24: 29–31. http://dx.doi.org/10.1087/20110105.
3. Shalvi, S., Baas, M., Handgraaf, M.J.J., and De Dreu, C.K.W. 2011. When should we submit our papers? Reply to Hartley. *Learned Publishing*, 24: 33–34. http://dx.doi.org/10.1087/20110106.
4. Bornmann, L. and Daniel, H.-D. 2008. The effectiveness of the peer review process: inter-referee agreement and predictive validity of manuscript refereeing at Angewandte Chemie. *Angewandte Chemie International Edition*, 47: 7173–7178. http://dx.doi.org/10.1002/anie.200800513.
5. Bornmann, L. and Daniel, H.-D. 2008. Selecting manuscripts for a high impact journal through peer review: a citation analysis of communications that were accepted by *Angewandte Chemie International Edition*, or rejected but published elsewhere. *Journal of the American Society for Information Science and Technology*, 59: 1841–1852. http://dx.doi.org/10.1002/asi.20901.
6. Bornmann, L. and Daniel, H.-D. 2010. The manuscript reviewing process: empirical research on review requests, review sequences, and decision rules in peer review. *Library & Information Science Research*, 32: 5–12. http://dx.doi.org/10.1016/j.lisr.2009.07.010.
7. Bornmann, L. 2011. Scientific peer review. *Annual Review of Information Science and Technology*, 45: 199–245.
8. Bornmann, L., Weymuth, C., and Daniel, H.-D. 2010. A content analysis of referees' comments: how do comments on manuscripts rejected by a high-impact journal and later published in either a low- or high-impact journal differ? *Scientometrics*, 83: 493–506. http://dx.doi.org/ 10.1007/s11192-009-0011-4.
9. Bornmann, L. and Daniel, H.-D. 2009. The luck of the referee draw: the effect of exchanging reviews. *Learned Publishing*, 22: 117–125. http://dx.doi.org/10.1087/2009207.
10. Bornmann, L. and Daniel, H.-D. 2009. Extent of type I and type II errors in editorial decisions: a case study on *Angewandte Chemie International Edition*. *Journal of Informetrics*, 3: 348–352. http://dx.doi.org/10.1016/j.joi.2009.05.002.
11. Bornmann, L., Marx, W., Schier, H., Rahm, E., Thor, A., and Daniel, H.-D. 2009. Convergent validity of bibliometric Google Scholar data in the field of chemistry. Citation counts for papers that were accepted by *Angewandte Chemie International Edition* or rejected but published elsewhere, using Google Scholar, Science Citation Index, Scopus, and Chemical Abstracts. *Journal of Informetrics*, 3: 27–35. http://dx.doi.org/10.1016/j.joi.2008.11.001.
12. Long, J.S. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks, CA, Sage Publications, 1997.
13. Geisler, E. 2001. The mires of research evaluation. *The Scientist*, 15: 39.
14. Hojat, M., Gonnella, J.S., and Caelleigh, A.S. 2003. Impartial judgment by the 'gatekeepers' of science: fallibility and accountability in the peer review process. *Advances in Health Sciences Education*, 8: 75–96.

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