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Factors affecting journal submission numbers: Impact factor and peer review reputation

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Abstract

Previous research has found that researchers rank journal reputation and impact factor (IF) amongst the key selection criteria when choosing where to submit. We explored the actual effect upon submission numbers of several possible factors. We retrieved 10 years of submission data from over a thousand journals, as well as data on IF, retractions, and other factors. We performed statistical analysis and identified correlations. We also undertook case study research on the 55 most significant submission decreases. We found a statistically significant correlation between changes in IF, ISI percentage ranking, and changes in submissions numbers in subsequent years. We also found a statistically significant effect on submission numbers in the year following the publication of a retraction. Our case studies identified other factors, including negative feedback on the peer review process. Our findings regarding IF confirm previous indications about the significance of IF on submissions. We explain the correlation with retractions through the concept of 'peer review reputation'. These results indicate that editors and publishers need to focus on a journal's peer review practices, as well as a journal's IF, if they are to maintain and grow submissions.

Keywords: submissions, impact factor, retractions

INTRODUCTION

The number of submissions received by a journal, whilst not always directly related to the quality of said manuscripts, often affects the overall number of articles published. The number of manuscripts submitted is therefore an important metric in the sustainability of a journal. Whether it is a subscription journal that wishes to maintain (or increase) its frequency of publication, or an open access journal that wishes to increase the number of articles it can publish (without jeopardizing academic rigour), the

Key points

- Increased impact factor (IF) correlates to increased submissions; decreased IF correlates to decreased submissions.
- Negative peer review reputation correlates to a decrease in submissions.
- Editors and publishers need to invest in peer review to maintain submission numbers.

success of a journal, both in terms of publication output and in terms of revenue, is ultimately dependent on the number of submissions it receives. For this reason, knowing the factors affecting submission numbers will be of significance both to journal editors and publishers.

Previous research has attempted to identify the factors considered by authors when choosing where to submit, primarily through surveys. A number of surveys conducted by Swan (1999) and Swan and Brown (2004) found that the two most important factors affecting the decision of where to submit were readership and journal quality; the question of readership was focused on reaching the right readers rather than the overall number. Solomon and Björk (2011) found the top three factors were fit to subject area of the journal, quality of the journal (sometimes measured by impact factor [IF]), and speed of review. Respondents to a survey by Søreide and Winter (2010) ranked journal reputation, followed by IF, as the two most important factors. However, after grouping several factors, the authors found that journal 'prestige', followed by turnaround time, were the two most important factors. Factors considered least important were acceptance rate, option to suggest reviewers, and open access. Özçakar, Franchignoni, Kara, and Muñoz (2012) found that the three most important factors were mission and contents of the journal, IF, and match between perceived quality of the study and journal IF. Gibler and Ziobrowski (2002) surveyed real-estate authors and found that the author perception of journal quality was the highest ranked factor. A survey of Canadian researchers found that journal prestige and IF greatly outranked other criteria (Phase5Research, 2014).

Unpublished research by Wiley, surveying authors of accepted manuscripts, includes a question as to the reasons for submitting to a journal. The top five ranked reasons are shown below, as of May 2019, along with percentage of respondents selecting that option; respondents could select multiple options.

- Scope of journal (70%)
- Reputation of journal (64%)
- IF (54%)
- Previous experience with journal (36%)
- Expected speed (29%)

Focusing specifically on open access journals, Schroter and Tite (2006) used interview and survey techniques to study author perceptions regarding where to submit. They found the most important factors were IF, reputation, readership, speed of publication, and the quality of the peer review system. Regarding willingness to pay article processing charges, they found that journal quality was the most important factor. A survey conducted by the Study of Open Access Publishing project found that 30% of respondents do not submit to OA journals due to the lack of high-quality OA journals in their field (Vogel, 2011).

Not many of the surveys separated peer review from other factors, such as journal reputation or journal quality. Nicholas *et al*. (2015) found that peer review was second only to relevance to the field, when choosing a journal. Being published by a traditional publisher and being highly cited were third and fourth. These respondents linked peer review with high quality. Focusing on OA journals, whether the journal was peer reviewed was the key selection criteria – even more important than whether the journal had a reputable publisher. Other research demonstrates that being peer reviewed is the key criteria authors use for distinguishing legitimate and predatory journals (Edie & Conklin, 2019).

An alternative methodology to surveying researchers was to try and model optimum submission strategies. Salinas and Munch (2015) modelled around maximizing expected number of citations, whilst minimizing number of required revisions and time in review (also see Heintzelman & Nocetti, 2009). Coupe (2004) argued that if authors behaved rationally, they would rank the risk of rejection more highly, because of the implications for delay in getting their manuscript published.

The absolute significance of IF, distinct from other factors, is difficult to access. A survey of ecologists by Aarssen *et al*. (2008) found that most respondents ranked IF as 'very important' or 'important'. Calcagno *et al*. (2012) found that high impact journals publish more resubmissions from other journals (with similar IF); low impact journals publish more 'first-intent' submissions. They hypothesized plausibly that this result was due to high impact journals competing for the same submissions. It is well known that IF is used by universities and other institutions to evaluate performance (Adam, 2002; Smith, 2006), and therefore publishing in a high IF journal can have implications for promotion and tenure. Gibler and Ziobrowski (2002) found that some author groups prioritize promotion and tenure considerations, whereas others prioritize ease and fairness of the process. Pepermans and Rousseau (2015) found a difference between authors of 'high quality' papers, who are looking for a journal with a high impact and/or high standing, and authors of 'standard quality' papers, for whom acceptance rate is of equal standing to IF. IF is also a key criterion used when creating lists of journal rankings, which are often used to determine where authors submit – though the use of such lists has been criticized for its negative impact on the literature (Willmott, 2011). One exception is the survey of librarians by Crampsie (2019). When respondents were allowed to select multiple options, IF ranked 15th (18%), behind journal scope (1st; 95%), whether the journal is peer-reviewed (2nd; 87%), and intended audience (3rd; 75%). When respondents were restricted to one, 'most important', option, IF ranked 5th (4%), behind scope (1st; 49%), whether the

journal is peer-reviewed (2nd; 21%), and publisher reputation (3rd; 8%).

It is notable that reputation and/or quality is often ranked higher than IF by respondents. Whilst IF can be one factor in establishing journal reputation, if it were the primary or only factor in a journal's reputation, one would expect these two reasons to be ranked on a par. The implication is that there are other aspects of a journal, perhaps not so easily quantified, that contribute to author perceptions of journal reputation, and thus to perceptions of suitability for submission. These might include the prestige of the editorial board, the reception of the journal on social media, and the negative impact of bad press.

Whilst surveying author perceptions is useful, what respondents say they will do in abstract situations does not necessarily indicate what they will do in actual situations. For instance, an author might value turnaround times but nevertheless submit to the highest IF journal in their field. In this study we wanted to explore actual submission numbers and correlate them with likely factors. Based on previous research, we identified three categories to explore and from those categories identified nine factors we wanted to test:

- IF
  - Absolute IF
  - ISI % subject category ranking
  - Journal reputation
- Net promoter score (NPS)
  - Average reputation score
  - Retractions
  - Altmetric score
- Editorial process
  - Time from submission to first decision
  - Time from submission to acceptance
  - Acceptance rate

Hypothesis 'Altmetric score' was later dropped due to availability of data.

METHODS

We retrieved annual submission data for all Wiley journals using ScholarOne Manuscripts between 2007 and 2018 (n = 1,004 journals). The percentage increase was calculated for each journal for each year between 2008 and 2018 (e.g. the value for 2008 was the difference between submissions in 2007 and 2008). Some journals were not publishing, or were not on ScholarOne Manuscripts, for all the years between 2007 and 2018, thus null values were marked 'n/a' and discounted from the calculation for that particular year. Values for the first and second year of publication were also discounted to avoid skewing. A manual inspection of the data was conducted to remove outliers. We also retrieved data on the median days from submission to first decision, the median days from submission to acceptance, and the acceptance ratio.

We retrieved all the retractions from Wiley journals listed on the Retraction Watch database. We also retrieved retractions listed under 'Wiley-Blackwell' and 'Blackwell Publishing', and then de-duplicated the results.

We retrieved the IF and ISI % primary subject category ranking for 2008 to 2018 for each of the journals in our sample. The ISI % ranking is a measure created by Clarivate which uses the IF of journals, within the subject categories defined by Web of Science, to rank them from lowest to highest (where 100% = first journal in subject ranking). We used the percentage ranking for comparison as it allows for more nuance than the actual category rank. Not all journals have an IF/ISI ranking or had an IF/ISI ranking for all years in our sample range.

We retrieved the average reputation score and the Net Promoter Score from Wiley's internal survey of accepted authors. This data is only available for 2016–2018.

An initial analysis was conducted by categorizing each annual change in submissions into either an increase or a decrease, then comparing this against each of the factors under investigation. Based upon this investigation, we proceeded with a statistical analysis of IF, ISI % ranking, and retractions.

For IF, the number of submissions in the 2 years after the IF being published were analysed (e.g. 2010 and 2011, following IF 2009), resulting in 17 different pairs (e.g. IF 2009 and submissions in 2010). For each of the pairs of years, simple linear regression was performed regressing the number of submissions a journal received in a given year on the IF of the journal for a given year. The IF is released midway through the subsequent year (e.g. IF 2017 was released midway through 2018), which is why we analysed the two subsequent years of submissions. One journal was removed from this part of the analysis as it is an outlier; its 2017 IF was over 200.

The same method was followed to analyse the effect of ISI % ranking on the number of submissions. Any journals with a reported ranking of 0 were removed from the data under the assumption that this reflected unranked journals, rather than journals lowest in their category.

For retractions, the percentage increase in submissions (2008–2018) was compared with the number of retractions published (2007–2017). Some outliers were removed. The impact of a journal having retractions on the percentage increase in the number of submissions received the year after the journal had retractions was analysed, resulting in 11 different pairs (e.g. 2007 retractions and 2008 submissions). Over the course of the 11 years, only 280 of the total 1,004 journals analysed had retractions. In fact, there are so few journals in a given year that have retractions that a simple linear regression does not provide an accurate analysis of the impact of retractions on the number of submissions a journal receives. For each year, the continuous data regarding the number of retractions in a journal was changed into binary categorical data so that each journal was labelled as either having retractions in that given year ('Yes') or having no retractions in that given year ('No'). For each of the pairs of years, a Welch two sample t-test (a variation on the traditional t-test) was performed in RStudio (R Core Team, 2017) comparing the

average percentage increase in the number of submissions a journal receives if it had issued retractions and the average percentage increase in the number of submissions a journal received if it had issued no retractions. This test was used to demonstrate any statistically significant difference in the means of the two groups, journals with retractions and journals with no retractions. Based on manual inspection of the data, we assumed that retractions are independent events, and that number of retractions in any given year does not affect retractions in subsequent years.

To further our investigation, we proceeded to conduct case studies. We limited ourselves to cases where the number of submissions declined by 10% or more from a level of 1,000 or more submissions. This resulted in 55 cases across 38 journals. We emailed the publishing manager for each journal, including any data described above that we thought might be relevant, and asked for their analysis as to why submissions declined in the given year. We received responses for 39 out of 55 cases, which were evaluated and categorized. We also undertook some desk research to identify any widely publicized reasons that might explain the decrease in the given year.

RESULTS

IF: Absolute IF

Each simple linear regression being performed by regressing the number of submissions a journal receives (ranging from 2010 to 2018) on IFs (ranging from 2009 to 2017) were statistically significant at a 0.05 significance level. Table 1 shows the coefficients found for each simple linear regression. For every 1-point increase in a journal's IF, the number of submissions the journal receives increases by the value in the table on average (range: 97.4–119.2; mean 105.4).

IF: ISI subject category ranking

Linear regressions were then performed with ISI ranking and number of submissions, using the same date ranges as for IF. For each 1% increase in ISI ranking, Table 2 shows the average increase in number of submissions received for each given year (range: 4.06–5.40; mean 4.68). All linear regressions were significant to (p) < 0.001.

Journal reputation: NPS

We were given guidance that 20 responses or more were required to be significant, which meant that there were only 601 cases (i.e. <14%) where there was significant data in a given year across the journals included in our sample.

The available data around average reputation score and NPS was too slight to make any meaningful analysis (most journals would have been excluded due to lack of sufficient respondents.) Of 601 available NPS scores, 591 were 'promoter' scores. Of the 10 'demoter' scores, only 3 corresponded with years when the number of submissions decreased at the same journal.

TABLE 1 Mean increase in number of submissions per every 1 point increase in IF.

	2010 # of subs	2011 # of subs	2012 # of subs	2013 # of subs	2014 # of subs	2015 # of subs	2016 # of subs	2017 # of subs	2018 # of subs
2009 IF	109.72	112.37							
2010 IF		100.63	97.55						
2011 IF			97.38	100.14					
2012 IF				97.01	98.65				
2013 IF					102.69	99.98			
2014 IF						103.2	104.91		
2015 IF							109.56	113.5	
2016 IF								110.6	115.0
2017 IF									119.19

Linear regressions show that IF has a statistically significant impact on the number of submissions a journal receives for each pair of year below. On average, submissions increased by ~100 manuscripts for each point increase in IF (actual increases would vary with the size of the journal).

TABLE 2 Mean increase in number of submissions for every 1% increase in ISI ranking.

	2010 # of subs	2011 # of subs	2012 # of subs	2013 # of subs	2014 # of subs	2015 # of subs	2016 # of subs	2017 # of subs	2018 # of subs
2009 ISI	4.18	4.34							
2010 ISI		4.33	4.11						
2011 ISI			4.06	4.24					
2012 ISI				4.6	4.85				
2013 ISI					4.92	4.86			
2014 ISI						4.73	4.72		
2015 ISI							4.9	5.04	
2016 ISI								5.04	5.16
2017 ISI									5.4

Linear regressions show that ISI % ranking is also significantly linked to the number of submissions a journal receives for each pair of years below. On average, submissions increased by ~5 manuscripts for each 1% increase in ISI ranking (actual increases would vary with the size of the journal).

Journal reputation: Average reputation score

The reputation score was between 1 and 5. However, there is little variation in our sample. Most average scores were between 4.6 and 4.8, with no correlation between average reputation score and submission numbers.

Journal reputation: Retractions

In total we found 937 retractions, though these included retractions for non-journal publications. After standardizing the journal titles, we identified the retractions, by year of publication, with the journals in our sample. There were 661 retractions across 280 journals between 2007 and 2018 for the our sample, with some journals having multiple retractions in the same year. (We did not attempt an analysis of whether multiple retractions have a bigger affect as the number of cases with multiple retractions would have been too small to be significant.)

Each Welch two sample *t*-test was performed for each pair of years as described in the Methods section. Table 3 shows the mean percentage increase in the number of submissions a journal received if it had one or more retractions in the previous year, as well as the mean percentage increase in the number of submissions a journal received if it had no retractions. The *p*-values are reported; 5 out of the 11 pairs are statistically significant. (For clarification: 0.01 would represent a 1% increase and −0.01 would represent a 1% decrease; for example.) For every pair of years that is statistically significant, the percentage increase in the number of submissions a journal receives is lower for journals that issue retractions versus journals that issue no retractions. The journals that issued retractions in 2007 show on average a percentage decrease in the number of submissions received in 2008.

The last 3 years (2016–2018) show a reverse trend. We suspect that this is due to the new start journals in the data. There was a mean average of 3.5 years between an article and its retraction, for those retractions in our data set (max = 30 years.) Journals that have been publishing for 3 years or less are significantly less likely to publish any retractions and therefore are likely to have skewed the data for the last 3 years.

Journal reputation: Altmetric score

Altmetric score was dropped due to availability of data.

Editorial processes

No, or only negligible, difference was found in percentage submission increases when analysing time to first decision, time to acceptance, and acceptance ratio. These null results are summarized in Table 4.

Case studies

Of the 39 responses we received, four did not identify a reason for the decline in submissions. In several cases the apparent decline was an artefact of the data caused by a change of

TABLE 3 Mean increase in number of submissions (retractions vs. no retractions).

Year	Mean (no retraction)	Mean (retraction)	diff	*t*-value	*df*	*p* value
2008	0.28	−0.01	0.29	6.52	33.85	1.87e-07
2009	0.1	0.04	0.06	2.53	30.59	0.02
2010	0.1	0.03	0.07	2.56	30.13	0.02
2011	0.1	0.07	0.03	0.91	25.67	0.37
2012	0.07	0.01	0.06	2.35	48.34	0.02
2013	0.06	0.05	0.02	0.39	53.66	0.7
2014	0.06	0.02	0.04	2.05	62.1	0.04
2015	0.05	0.03	0.02	0.66	47.82	0.51
2016	0.02	0.04	−0.02	−0.67	58.62	0.5
2017	0.03	0.08	−0.04	−0.97	57.35	0.34
2018	0.09	0.12	−0.03	−0.64	58.23	0.52

Note that figures are provided as percentages, so 0.01 would represent a 1% increase and −0.01 would represent a 1% decrease.

TABLE 4 Percentage of journals in sample with submissions increase/decrease for each factor.

	NPS score		Time to first decision		Time to acceptance		Accept ratio	
	Promoter	Demoter	Increased	Decreased	Increased	Decreased	Increased	Decreased
Submissions increase	0.62	0.7	0.65	0.68	0.68	0.67	0.68	0.67
Submissions decrease	0.38	0.3	0.35	0.32	0.32	0.33	0.32	0.33

None of these findings were significant.

submission systems (*n* = 3) or the splitting of the journal into two (*n* = 3). Some respondents identified external factors, such as IF (*n* = 4) or competitor journals (*n* = 3) as the primary factor. The emergence of 'sound science' mega-journals has added to the competition from more traditional specialized journals. Others identified internal journal changes as the primary factor, including a change of editor(s) (*n* = 2), increased rejection rates (*n* = 3), and turnaround times (*n* = 2). In several cases the decline in submissions was explained as an intentional editorial strategy to refocus the journal (*n* = 6), or by a move away from commissioned content (*n* = 4). In one case, the decline in submissions was connected by the respondent to a highly publicized case of misconduct by the editor-in-chief. In another case, the decline in submission was explained by imposition of complicated and unnecessary submission requirements (Table 5).

The importance of IF was a common feature of respondents. One publishing manager said 'if authors have to choose between 3 journals with the same scope, they'll go in order of IF almost all the time'. An editor-in-chief worried about the influence of IF, noting that some authors chose a competitor journal with a higher IF, despite claiming 'this is a poorly managed and uneven journal, and that papers published there are viewed very differently'.

Our evaluation of the factors did not agree with the respondents in every case (Table 5). IF was raised frequently in the responses, as a secondary factor if not the primary one, but in some cases the decrease in IF or ISI category ranking was relatively small. In two cases the respondents explained the decrease in submissions as an expected fluctuation, which seemed unlikely when given the extremity of the decline. One respondent proposed that the decline in submissions was due the journal rejecting more, when in fact the acceptance rate went up. Retractions were not a factor identified by any of the respondents but, given our data, it seemed to be the most likely factor in at least four cases.

Our statistical analysis did not find a correlation between acceptance rate and submissions, but some of our respondents highlighted a connection. One editor-in-chief, who has worked on several journals, said 'if you get a huge spike in rejection rate, you can get a drop in submissions'.

Additional desk research looked at social media in the researcher community (e.g. scirev.org; letpub.com; pubpeer.com, Twitter, etc.) regarding the journal and year of each case study. In four cases we identified significant negative comments regarding aspects of peer review at the respective journal, concerning either the process or the outcomes.

We also identified a decline in the industry connected subject discipline of the journals in three of our cases; we suspect that the decline in that industry may correlate with a decline in research output. A respondent to one of our other cases also identified a decline in research funding in the journal's field as a factor.

TABLE 5 Primary reason for submissions decline, (a) as identified by respondents, and (b) adjusted following our desk research.

Category	Respondents	Adjusted following research	diff
Bad peer review reputation	-	4	4
Change of editor(s)	2	2	0
Competitor journals	3	3	0
Decline in research output	-	3	3
Expected fluctuation	2	0	−2
IF/ISI ranking decline	4	11	7
Intentional editorial strategy	6	6	0
Journal split	3	3	0
Less commissioned content	4	3	−1
Moved submission system	3	3	0
None given	4	0	−4
No obvious reason	-	10	10
Prior submissions spike	1	0	−1
Rejection rate	3	0	−3
Retractions	-	4	4
Significant editor misconduct	1	1	0
Turnaround times	2	1	−1
Unnecessary submission requirements	1	1	0

We attempted to identify a reason in our research, even where there was no response to our case study request.

LIMITATIONS

The analysis of IF looked at number of submissions, rather than percentage increase, so the average increase is rough and not generalizable across all journals. Future analysis could include repeating these analyses stratified by subject area, or other factors, to improve the accuracy of the coefficient. Also, future analysis could look at relative ISI subject ranking, rather than absolute IF.

For each year of analysis there is a very small sample of journals with retractions (often under 30 journals), which may cause issues with the accuracy of the results of the *t*-tests. This analysis does not distinguish between a journal publishing 1 retraction in a single year versus a journal publishing 15. Some journals issued retractions every year, or most years, so no difference can be analysed.

The IF is released midway through the calendar year. Retractions might be published at any point in the calendar year. Future analysis could look at submissions by month, perhaps focusing on the 12-month period after the release of the IF or publication of the retraction.

Because the sample includes journals that started publishing within the timeframe (or shortly before), efforts were made to exclude the first and second year of submissions data. However, the submissions growth of a new journal may not be linear and may be uneven.

New journals are unlikely to have an IF and less likely to have retractions.

DISCUSSION

There are many factors involved in the number of submissions a journal receives and many of them are beyond the control of the editor or the publisher. The number of research papers being written will be dependent in large part on the amount of research funding available and the number of relevant untapped research areas in that field. (One respondent to our cases noted how the technique covered by the relevant journal is now 'commonplace' leading to a decline in new research.) Even where research funding remained unchanged, submission numbers would still fluctuate, dependent on the incidence of negative or null results (which are commonly not submitted for publication.) Therefore, submission numbers are unlikely to rise evenly. Because there are multiple submission options for authors, including both general and specialized journals, there is competition between journals for submissions.

From our data, we identified three factors that have a significant impact on submission numbers. The finding that changes in IF correlate to changes in submissions is not surprising, as it fits with prior research about authors' selection process. Because IF is used by various bodies, including universities and funders, to assess published research, authors will inevitably seek to be published in journals with the highest IF. One of our respondents noted, 'it has been unfortunate that some countries and grant agencies set arbitrary limits of what IF journals will or will not count in certain metrics'.

ISI ranking is closely linked to IF, so it is expected that this too would correlate with number of submissions. As ISI % ranking takes the subject area of the journal into account, this is a useful result that suggests the findings can be generalized, and are not skewed by certain subject areas, which may contain journals with higher average submissions or IFs.

Our third finding is less expected – that retractions correlate with lower submissions. Prior research indicated that journal reputation is an important factor for authors when choosing where to submit. Our case study research found that negative research comments about a journal's peer review occurred in years with significant declines in submissions. Though an isolated case, the decline of submissions following editor-in-chief misconduct seems indicative of a correlation between journal reputation and

submissions. To distinguish these reputational effects from IF, we shall categorize them 'peer review reputation' (PRR). (We use 'peer review' in the general sense, incorporating the roles of editors and editorial office staff in manuscript evaluation.) We propose that PRR is an important selection criterion for authors and that significant negative PRR will lead to a decrease in submission numbers. We believe this is the reason for the correlation between retractions and submission numbers. (Previous researchers have used retractions as a metric for peer review quality; see Horbach and Halffman (2018)).

Whilst in many surveys journal reputation was ranked higher than IF, it is not possible to use our data to contrast IF and PRR (as measured by retractions) to determine which is the more significant 'risk factor' for a decrease in submissions. Our analysis of these two factors involved different tests and different types of analysis, which are not easily comparable. Also, the number of retractions, whilst statistically significant, was relatively small. Changes in IF correlate to both increases and decreases in submission numbers, whilst retractions only correlate to decreases in submissions. Retractions are also a binary measure; either a retraction was published, or it was not. The cases where multiple retractions were published by the same journal in the same year were too few to test for any correlation between number of retractions and number of submissions – we do not expect such a relationship. Furthermore, it may be that trying to rank IF against PRR would be meaningless in any case.

It is worth noting the previous finding that high IF journals published more retractions (Fang & Casadevall, 2011). Those authors speculate that the correlation may be due to the high IF increasing the incentive for authors to manipulate their results in order to get published, or may be due to higher IF journals coming under more intense scrutiny. Others have proposed that high IF journals favour papers reporting novel and unexpected results, which are disproportionately likely to be retracted later (Agrawal & Sharma, 2012). Regardless of the cause, this correlation between IF and retractions means that the correlation between these two factors and submissions will not be a simple one; it may be impossible to truly isolate each factor in an analysis.

We found no correlation with submissions for factors such as acceptance rate and turnaround times. One might expect authors to care about the expected speed of dissemination and the likelihood of being published, and there is some indication of this in the literature. We suspect the reason that there was no correlation is that these metrics are not routinely made available to authors. Editors and publishers might consider advertising acceptance rates and turnaround times to assess the impact on submissions. Pepermans and Rousseau (2015) found that, for high-quality papers only, framing the metric as an acceptance rate, rather than a rejection rate, did lead to authors being more likely to submit.

CONCLUSION

We found that IF, ISI ranking, and retractions do have an impact on submissions, but this information needs to be treated with care. There will be natural fluctuations in IF year-on-year. Furthermore, a journal may prioritize strategies for the benefit of their readers that have negatively impact the journal's IF, such as publishing content targeting practitioners or clinicians, which might be highly downloaded but poorly cited.

There are multiple factors that affect submission numbers. We have been able to statistically verify two such factors but there are certainly others, where either the data is not currently available or are more difficult to quantify. Our results do not justify a simplistic focus on only one or two factors.

We do not believe that the correlation between retractions and submission numbers should be considered an incentive for editors or publishers to not publish retractions. First, publishers have a responsibility to maintain the scientific and scholarly literature, which includes the publication of retractions, corrections, and errata. Second, whilst retractions correlate with submission numbers, there are many incidences in our data where there was no effect, so it is too simplistic to conclude that retractions *cause* declines in submissions. Retractions are a quantifiable way of measuring PRR, but certainly not the only aspect of it. Third, as our case studies indicate, negative PRR is transmitted by many means including word-of-mouth (which would be impossible to quantify) and not just via retractions. Finally, we suspect that not publishing a retraction, where one was justified, would ultimately lead to a greater decline in PRR than publishing the retraction.

We recommend that editors and publishers consider both PRR and IF when analysing submission numbers. Given that PRR is likely to be a significant factor in determining journal choice, publishers may want to find metrics other than retractions by which to measure it. Journals need sustained or increasing submissions to remain viable, so editors and publishers should aim to maintain a journal's PRR, as well as its IF, to continue to attract submissions. Underinvesting in the practices and processes around peer review may lead to smaller submission numbers and thereby smaller revenues in the longer term.

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CONFLICT OF INTERESTS

TG, EJ, and SR are all Wiley employees. FO was also a Wiley employee when the research was conducted and has since left the company. TS was an intern at Wiley when the research was analysed.

AUTHOR CONTRIBUTIONS

TG contributed to conceptualization; data curation; investigation; methodology; project administration; supervision; writing – original draft; writing – review and editing; FO contributed to conceptualization; data curation; investigation; methodology; writing – review and editing; EJ contributed to data curation; investigation; methodology; formal analysis; writing – review and editing; SR contributed to formal analysis; methodology; validation; writing – review and editing; TS contributed to formal analysis; methodology; writing – original draft.

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