

# Should We Care How Long to Publish? Investigating the Correlation between Publishing Delay and Journal Impact Factor

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**Abstract.** This poster presents a research that examines the correlation between publishing delay and impact factor of academic journals. Data of 9,028 articles in 91 library and information sciences (LIS) and biology journals were collected from WoS Journal Citation Report (JCR 2016), and then analyzed and compared. The data analysis shows that LIS journals have greater publishing delay than biology journals. The study result shows that there is no correlation between publishing delay and journal impact factor, although, a small negative correlation for biology journals and a small positive correlation for information science journals can be seen.

**Keywords:** Publishing Delay, Journal Impact Factors, Peer-reviewed Journals, Scholarly Communication

## 1 Introduction

Publishing delay was defined as the time period between submission and publication of an article for a scientific journal[1]. It is common for authors to wait for several months before their works get formally published because all submissions need to be peer-reviewed and there is always delay caused by editorial works. Occasionally, some articles that had extensive rewrites and second peer review before being published. Sometimes the waiting time can be longer than a year or even two years. Researchers are becoming increasingly frustrated by the time it takes to publish a paper. The length of the delay depends on the review and publishing cultures that have evolved in different disciplines[2]. In addition to disciplinary differences, some data suggested that there are relations between journal impact factors and publishing delay [3, 4, 5].

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This poster reports on a study that examines the relationship between publishing delay and impact factor of academic journals, as well as to investigate the disciplinary difference in publishing delay.

## 2 Literature Review

A large-scale survey carried out by Nature Publishing Group(NPG) showed that the publishing delay has been increasing in the past decade and most researchers felt frustrated over the long time it took journals to publish a paper[5].By studying more than 300 Korean medical journals, Li and Kim[6]found that the total publication delay was 264.5 days. Some authors reported that peer review process affected the publication delay observably[1]and the publishing business model can be a factor as well[7].

Because the competition is becoming fierce and publishing in prestigious journals can be required for career advancement, many works have been done to explore the relationship between publishing delay and journal impact factor.An analysis ofPubMed papers published in 2013 suggests that journals with the lowest and highest impact factors have the longest review times[3]. However, a study on social science journals suggested that the journal with the longer publication delay tend to have lower impact factor[8]. In the inter-citation journal group, a journals' publishing delay increased would lead to all journals' impact factors decreased and the ranking of journals may be changed[3].

Furthermore, disciplinary difference has been identified and confirmed as a factor which influences publishing delay. The existing works report that journals in business study cost the longest of 18 months to publish researches, which is twice as the chemistry[2].

Based on previous studies, the following research questions have been formulated: (1) Is there any disciplinary difference in publishing delay? (2) Is there correlation between publishing delay and impact factor of a journal?

## 3 Methods

According to the above, we put forward two hypotheses:

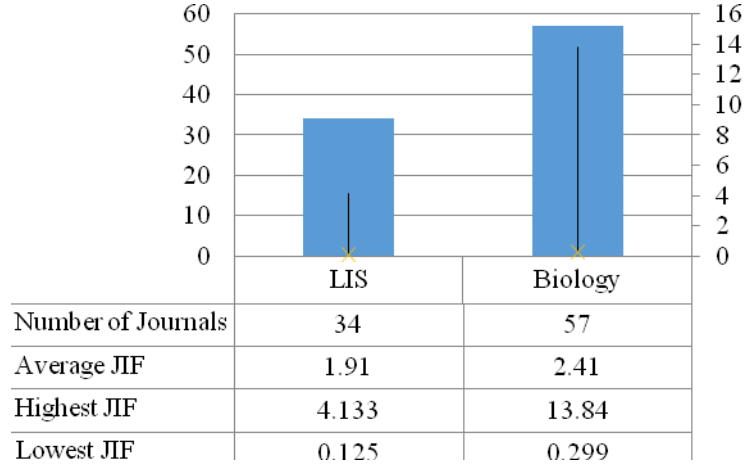
*H1. Journals in different disciplines have different publication delay;*

*H2. There is correlation between publishing delay and impact factor of a journal.*

In order to test the hypotheses, quantifiable indicators must be applied. There are a number of possible sources of information about publication delays. One option is to gather article data about submission and acceptance dates which is often published individually in each article or on the articles' face page on the publisher's website. This is a very labour-intensive process but provides precise statistics for the articles sampled[2]. So we adopted this approach.

The source database was the Web of Science, which contains information about 11,000 scholarly journals, including the yearly article and journal impact factor scores. Journals from LIS and biology were selected as samples for comparing. There are two reasons why we chose these two disciplines to study. Firstly, they are compa-

table in numbers in the source database: 84 LIS journals and 85 biology journals that were indexed in JCR in 2016. Secondly, they belong to social science and science study area respectively. By checking article's face page of each journal, we identified that 34 LIS journals and 57 biology journals have the records of article-received date. So there were 91 (n=34+57) journals in total for our study. The journals' impact factors were compared and shown in Figure 1.



**Fig. 1** Journal Impact Factor Difference between Two Disciplines

Source: *Journals Citation Reports (2016)*.

According to the definition and previous works [3,4,5] the publishing delay for a paper (PDP) can be formulated by online publishing data (OPD) and paper received date (PRD), as equation (1) shows:

$$\text{PDP} = \text{OPD} - \text{PRD} \quad (1)$$

Then, the journal publishing delay (JPD) can be represented by the mean value of all papers' publishing delays in a certain time period (2016), as equation (2) shows:

$$\text{JPD} = \frac{\sum_{k=1}^n x_k}{n} \quad (2)$$

In the end, correlation analysis was done to explore the relations between journal publishing delay and its impact factor. Pearson Correlation Coefficient was used to test the significance of the correlation as equation (3) shows.

$$r = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \cdot \sum_{i=1}^n (y_i - \bar{y})^2}} \quad (3)$$

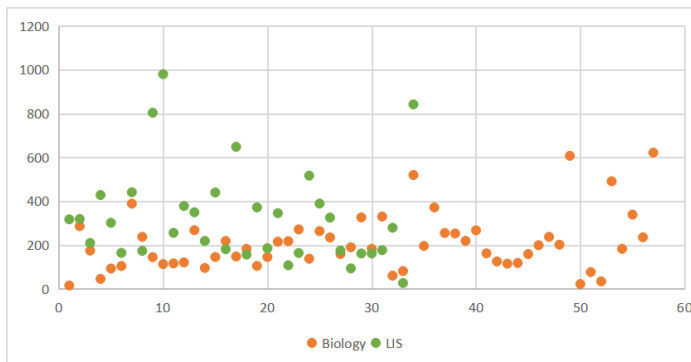
## 4 Results

Based on data analysis above, the average publishing delay of individual journal was presented (See Table 1 and Figure 2). As we can see, there is an obvious difference between the two disciplines over publishing delay, so hypotheses 1 passes the test. LIS journals have greater publishing delay than biology journals. The mean delay in LIS was 436.19 days and the median reached up to 300 days. It suggested that scholars in LIS areas have to wait for more than a year to see their paper published. For scholarly communication, such a long publishing delay is unacceptable. In biology field, the situation seemed better. Its mean delay was 207.57 days and the median was only 57 days. Even so, such a long waiting period could frustrate biologists.

Meanwhile, we see the extremely wide differences between the mean and median in both disciplines. Our study showed that a few journals that are driving the difference. In LIS area, there are a total of 8 journals with over 360 days of publishing delay, the longest delay is 979 days on average for a journal. On the contrary, in biology area, a total of 8 journals whose publishing delay are less than 90 days.

**Table 1.** Compare of Publishing Delay between Biology and LIS Journals(2016)

Discipline	Number of Journals	Number of Papers	Average Delay(days)		Max Delay (days)	Min Delay (days)
			Mean	Median		
LIS	34	1788	436.19	300	979.93	26.88
Biology	57	7240	207.57	57	621.87	15.60



**Figure2.** Scatter Diagrams of Average Publishing Delay in Biology and LIS

*Note: Each dot represents a single journal. Y-axis represents days of publishing delay and X-axis represents journal impact factors.*

According to the test of significance of correlation (see Table 2), in both biology and LIS areas, no linear correlation between journals impact factor and publishing delay. So the hypothesis 2 has been rejected and the conclusions from previous works cannot be confirmed by our study. However, the results exhibit a small negative correlation (-0.25) for biology journals and a small positive correlation (+0.3) for information science journals. Although the significance values (about 0.06 and 0.09) are not that great to falsify the hypothesis completely, the opposite directions of biology and information science journals can be seen. We presume that is because

of the disciplinary difference, namely the biology discipline's requirement of time-efficiency in scholarly communication is higher than LIS discipline, which makes the good journals are of short paper waiting time. Moreover, in our sample, there are more OA journals in biology area(13 out of 57,23%) than in LIS area(3 out of 34, 9%). There are more good quality OA publications in biology might be another reason why the correlation is slightly positive. But more evidence needs to be provided in further study.

**Table 2.**The Significance Test of Correlation

Average Delay	Biology		LIS	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Mean	-0.253	0.058	0.292	0.094
Median	-0.204	0.129	0.31	0.075

## 5 Conclusions and discussions

The results of our study suggested that the disciplinary difference is obvious in publishing delay but there is no significant correlation between publishing delay and journal impact factor. However, our research has its limitations. For instance, only two disciplines have been tested and the number of resource database need to be expanded. In practice, the relation between publishing delay and journal impact factor might be more complex. Publishing model, peer review method, reputation of the journal, and editorial delay can influence publishing delay and induce journal impact factor changes. Additionally, publishing delay may probably influence the latest scholarly communication and that may slow down the pace of scientific research progress. So in future, more research should be done to investigate the relations and correlations among specific academic publishing processes, scholarly communication and journal impact factors.

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