

PUBLICATION DELAYS IN PEER-REVIEWED JOURNALS OF OTOLARYNGOLOGY, AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY

Yike Li MD, PhD; David Zealear PhD

Department of Otolaryngology, Vanderbilt University Medical Center, Nashville, Tennessee, 37232, U.S.A. **Correspondence:** yike.li.1@vanderbilt.edu

ABSTRACT

The primary objective of this study was to investigate publication delays in scholarly peer-reviewed journals in the field of otolaryngology, audiology and speech pathology. A list of 58 journals indexed in the Journal Citation Report by Thomson Reuters were included. Bibliographic content of publications in these journals from 2007-2017 was extracted from the National Center for Biotechnology Information databases using the "RISMed" package of R. The acceptance delay was defined as the time lapse between the submission date and the acceptance date. The editorial delay was the time lapse between the acceptance date and the publication date. These data were plotted using the "ggplot" function. A total of 28084 articles were eligible for data analysis. The average publication delay for all journals in otolaryngology, audiology and speech language pathology was about 7 months. The peer review process was the major aspect in determining the publication delay. Several factors, such as the impact factor, journal size, publication frequency, subscription type as well as geographical region, were found to be correlated with the delay in each phase of the entire publication process.

KEYWORDS: Publication delay, peer review, journal impact factor, open access

INTRODUCTION

After completion of an electromyographic study on laryngeal muscles using an implantable system three years ago, we submitted a manuscript to a peer-reviewed journal in September 2014. Our expectation was to have our research findings published within one year from submission. Unfortunately, the manuscript was returned 6 months later with a request for major revision in order to fit the journal's scope. The potential change was so significant that we decided to have it withdrawn and submitted elsewhere. Finally, the manuscript was accepted by another peer-reviewed journal in August 2016, with a total of 3 submission attempts, 4 revision requests by the editors and 6 by the reviewers. The paper was then published ahead-of-print online in January 2017 and officially published in April 2017 [1]. Meanwhile, another paper was still backlogged at the time when the current study was being prepared, although it

had been accepted for over 5 months [2]. Like anyone else involved in scientific research, few things would cause us as much anxiety and frustration as delays associated with publications. Therefore, we decided to investigate whether such delays were commonplace in the field.

It usually takes time to translate research findings into public knowledge, as the publication process faces numerous delays. The time from receipt of the manuscript by the journal to the date of publication is referred to as publication lapse or delay. Generally, this delay can be divided into two parts [3-5]. The first delay is associated with the duration from the receipt of an article up to acceptance. This acceptance delay is mainly spent on peer review. The second delay starts from the time of acceptance and lasts until publishing of the manuscript. It mainly consists of editorial

procedures including typesetting, correction, printing, binding, etc., thus is often referred to as editorial delay. Rapid publication of articles may enhance the translation of the research to application, and may also promote further research in the particular discipline. On the other hand, a long publication lag may diminish a paper's visibility and thus citation rate [6]. As a result, publication speed is one of the most important factors influencing authors' choices of journals to publish their manuscripts [6]. A slow publication speed may stop authors from submitting their work to the respective journal. Researchers may also be reluctant to present or discuss their unpublished work in scientific conferences, thus slowing down the pace of scientific advancement.

Several studies from different disciplines and sub-disciplines have tried to quantify and explain factors associated with publication delay. Works have been devoted to various fields, including psychology [7], chemistry [3, 8], microbiology [9], econometrics [10], and biomedicine [6]. The average publication delay varied largely from 9 months (chemistry, engineering) to 18 months (business and economics) across disciplines [11]. The mean publication delay for biomedical journals was about 9.5 months [11] and it may even be much shorter for some famous journals [6]. Publication delay may be correlated with the number of publications and the citation rate of a journal by varying degrees in different disciplines [11]. However, despite an extensive literature search, no previous study was found to investigate the publication delays in the journals of otolaryngology. Alternatively, there should be a possible source of information about publication delays from journals' websites. However, few journals have made this data available, perhaps because publishers and editors are hesitant to disclose long delays [11].

The current study was motivated by our curiosities, and more importantly, the need for information to guide the selection of journals for submission of papers in future. The primary objective was to investigate publication delays in scholarly peer-reviewed journals in the field of otolaryngology, head and neck surgery. Journals in the disciplines of audiology and speech language pathology were also included, as both are highly correlated to the under-researched discipline. To understand how publication delay varied in different types of journals, the relations between the delay and a few factors of the journal were also investigated. These factors included the impact factor (Clarivate Analytics, Philadelphia, PA), the number of published articles per year, publication frequency, subscription versus open access, and geographical region.

METHODS

Journal selection

The journals included in this study were all indexed in the Journal Citation Report (JCR) 2015 by Thomson Reuters. A total of 58 journals were listed under the categories of "OTORHINOLARYNGOLOGY" and "AUDIOLOGY AND SPEECH-LANGUAGE PATHOLOGY" (Table 1). Detailed information for all journals were further obtained from the SCImago Journal & Country Rank, National Library of Medicine (NLM) catalog, as well as the journals' websites.

Data collection and analysis

Data collection and analysis procedures were conducted using R [12]. All articles published in

each of these journals between January 2007 and March 2017 were retrieved from the PubMed database using the “RISMed” package [13]. This package allowed users to extract bibliographic content from the National Center for Biotechnology Information (NCBI) databases, including PubMed. The search query for articles published by each journal consisted of the journal’s title (e.g. “Laryngoscope”) followed by the field descriptor of “[journal]”. For each article, three key time points were extracted: manuscript submission date, acceptance date and publication date, respectively. For journals that publish articles in more than one form (e.g., online and in print), the publication date was defined as the date when the manuscript was first published. The acceptance delay was obtained by subtraction of the submission date from the acceptance date. Similarly, the editorial delay was the time lapse between the acceptance date and the publication date. The entire publication delay for each article was the sum of its acceptance delay and its editorial delay. These data were plotted using the “ggplot” function with means and standard errors calculated automatically by the function [14]. To assess the correlation between a particular factor of a journal (i.e., the impact factor, publication frequency, etc.) and each phase of the publication delay, the intraclass correlation coefficient (ICC) was calculated using the “ICCest” function. This function returned an ICC value with its statistical significance [15].

RESULTS

On March 14th 2017, an extensive search for articles that were published after 1/1/2007 in all of 58 journals returned a total of 78050 bibliographic records from PubMed. Further examination of these records revealed that some journals did not provide information regarding

the time of submission and/or acceptance. Therefore, publication delay could not be obtained in any of these journals. After removal of those records, a data set of 28084 articles from 30 journals contained valid date information at all three time points (i.e. publication date \geq acceptance date \geq submission date), and were used for further analysis. The information of these journals were summarized in table 2.

The average publication delay in all journals of otolaryngology, audiology and speech language pathology was 216 days, including an average acceptance delay of 127 days and an average editorial delay of 89 days. Figure 1 shows the average acceptance delay (grey bar) and the average total publication delay (grey plus blank bar) of all journals in each of the past ten years. The average acceptance delay varied slightly from a minimum of 113 days in 2012 to a maximum of 149 days in 2017. The total publication delay, on the other hand, demonstrated a declining trend over time. The number went from 258 days in 2007 down to 200 days in 2016, indicating an increase in average publication speed of these journals. The ratio of the acceptance delay over the total publication delay is shown in figure 2. The percentage increased from 55% in 2007 to approximately 66% in 2017. It implies that the time lapse in peer review process has become more and more important in determining the publication delay.

In order to visually display what types of journals are associated with greater publication delays, data were plotted by different factors. The impact factor is arguably the most important aspect for evaluation of the quality of a journal. Figure 3 presents the acceptance delays and total publication delays in journals with different ranges of impact factors. The shortest average

delays in both acceptance and publication were seen in journals with impact factors of 1-2 (126 and 189 days, respectively). Journals with impact factors less than 1 had the lowest delay in acceptance (114 days) but the longest delay in publication (324 days), indicating a huge lag in editorial phase (210 days). This delay was over 3-fold higher than that of the journals with impact factors of 1-2. The percentage of peer-review process over the entire publication duration was 64% and 67% in journals with impact factors of >2 and 1-2, respectively. Both numbers were considerably higher than that of the journals with impact factors less than 1 (35%).

Journal size, reflected by the annual number of published articles, could be another factor that affects the publication delay. As shown in figure 4, large-size journals demonstrated considerably lower delays in both acceptance (106 days) and publication (163 days) than those of medium- (141 and 248 days, respective) and small-size (164 and 312 days, respectively) journals. Notably, the smaller the number of articles a journal annually published, the longer the delays associated with peer review as well as the entire publication it experienced. A likely explanation was that journals with higher numbers of annual publications typically have greater numbers of reviewers as well as editors. These journals may experience shorter delays in finding appropriate reviewers and editorial processing of accepted manuscripts. Therefore, journals with higher annual publications demonstrated shorter publication delays compared to those that published fewer articles.

Journal's publication frequency may also affect the publication delay, presumably in face of the time lapse for assigning papers into issues. As shown in figure 5, monthly journals had the lowest acceptance delay (116 days) as well as

total publication delay (172 days). Bimonthly journals had the longest acceptance delay (150 days). The longest publication delay was seen in both bimonthly and quarterly journals (285 and 288 days). Not surprisingly, the percentage acceptance delay was highest for monthly journals (68%) and lowest for quarterly journals (45%). Such rank order was probably due to the differences in time lapses for bundling articles into issues.

Figure 6 demonstrates the delays in open access journals and traditional subscription journals. The traditional journals had marginally shorter acceptance delay (126 days) than the open access journals (136 days). However, the open access journals had considerably greater delay in publication (400 days), which resulted from their huge editorial delay (264 days). Large difference in the percentage time for peer-review process was seen between the traditional subscription journals (64%) and the open access journals (34%).

Figure 7 shows the delays in journals from different geographical regions. Generally, European journals had shortest acceptance delay (112 days) as well as total publication delays (175 days). They also had the highest percentage of peer-review time (64%). American journals displayed slightly longer delays in acceptance (143 days) and publication (232 days), also lower percentage time for peer review phase (62%). Journals from other regions had comparable speed in peer review (142 days, 33%) but huge lag in editorial processing (286 days), resulting in a long delay in publication (427 days).

There were a total of 30 journals issued by 14 different publishers. Figure 8 shows the mean

acceptance and publication delays for each publisher. On average, four publishers (i.e. Blackwell, Springer, Biomed, Elsevier) published their articles at the fastest speed, within 180 days from submission. The other five (Saunders, Sage, Wiley, Mosby, Karger) typically published their articles with longer delays of 200 - 270 days. Some journals from these three publishers (KORLHNS, Pacini editore and ENT-bra) had a quick response time in peer review phase, but much longer editorial delays. The latter kept their manuscripts from being published in a timely fashion. Blackwell, Springer, Biomed had the greatest percentages (>75%) of peer review time during the whole publication process, indicating they had efficient editorial teams.

Comparisons were made among some specific journals that are popular in the fields. To minimize the selection bias, impact factor and the number of annual publications were used as the criteria. All journals with the impact factors (shown in Journal Citation Report 2015) over 1, and with an average annual publications of over 100 in the last 3 years were included. A total of 14 journals met the two criteria, their publication delays were plotted in figure 9. International Journal of Pediatric Otorhinolaryngology, European Archives of Oto-Rhino-Laryngology, and Clinical Otolaryngology were top 3 journals on the list with regards to publication speed. The mean publication delays in these three journals were all below 150 days. Language, Cognition and Neuroscience, as well as Journal of Speech, Language, and Hearing Research had the longest publication delays of over 300 days. For most of the journals, over 2/3 of the total delay was spent on the peer review process. This proportion of time was the lowest for Journal of Voice and Otolaryngology–Head and Neck Surgery (< 50%).

ICC was calculated to assess the degree of relation between the delay associated with each phase of publication and each of the above-mentioned factors. Results are shown in Table 3. Acceptance delay was mildly correlated with the impact factor and the annual publications of a journal. Compared to acceptance delay, all factors had stronger correlations with the editorial delay, with ICCs varying from 0.23-0.65. On the whole, the subscription type of a journal appeared to have highest ICC for the publication delay, accounting for 50% of its variances.

DISCUSSION

For the past 10 years, it took an average of 216 days for an article to be published in peer-review journals of otolaryngology, audiology and speech language pathology. Specifically, it took 127 days (59% of the duration) for a manuscript to get reviewed, revised before being accepted by the journal. It would then have to wait for another 89 days (41% of the duration) to get published. The time lapses for all these phases appeared to range between the averages reported by two different studies on publication delay in journals of biomedical sciences (Figure 10). In this study, the duration of publication delay in the field of otolaryngology, audiology and speech language pathology depended mainly upon the peer review stage of the publication process. This finding was consistent with Dong et.al. [6], but contrary to Björk et.al. [11]. The differences in results among these studies may partially be attributed to different criteria in selection of journals. In the study of Dong et.al., all selected journals were published by either Nature Publishing Group or BioMed Central. Those journals generally had a large reservoir of reviewers as well as editors, which might have shortened delays in the two publishing phases, especially in the editorial

phase. In contrast, Björk et.al. randomly selected 15 biomedical journals with different sizes, so that variances among the journals in their study were higher. In the current study, data were sampled from a total of 30 journals by 14 publishers. Analyses were conducted based on over 28000 articles published in the past ten years. All these numbers were considerably higher than any of the previous studies. Therefore, results from the current study could better reflect the overall publication delay in the fields being studied.

The average publication delay has declined by about 60 days in the past 10 years. Meanwhile, only minimal variations occurred to the average acceptance delay in these journals. The editorial delay has been shortened significantly, from 130 days 10 years ago to 70 days in 2017. The decrease in editorial delay could have benefited from advancement of technology in document processing. In addition, more and more journals started to pre-publish their accepted articles online, thus shortening the editorial delay as well as the total publication delay. Therefore, the decrease in editorial delay was the main cause for increased publication speed as well as greater percentage of time lapse in peer review process. Taken together, it could have reflected that the scientific rigor has been preserved in these peer-reviewed journals along with a slight increase in their publishing speeds.

Several factors were found to affect the time lapse in each of the publishing phases. First of all, the effect of the impact factor on publication delay seemed to be a double-edged sword. On one hand, lower impact factor was associated with lower acceptance delay, presumably because of their less strict scientific requirements on the manuscripts. On the other

hand, a journal with lower impact factor appeared to have longer editorial delay, the reason of which is not yet understood. As a result, the lowest average delay in publication was found in journals with medium impact factors. Secondly, both the annual number of published articles and the publication frequency of a journal were inversely correlated to its publication delay, mainly by affecting the time lapse in the editorial phase. Thirdly, subscription type of a journal also had a strong effect on its publication delay. Although open access journals had acceptance delays comparable to those of the traditional journals, the former had considerably longer editorial delays. This finding was supported by a previous study [6]. It was a bit contradictory to our understandings, that open access journals are usually electronic only and tend to publish articles quickly without having to bundle them into issues. A possible explanation is that the open access journals spent more time in editing manuscripts than the traditional subscription journals did. As mentioned above, more and more traditional journals have started to pre-publish their accepted manuscripts online, which has significantly shortened the publication delays. Finally, an interesting difference in publication delay was found between journals from different geographical regions, but its implication is not yet understood.

Besides above mentioned, publication delays can result from additional factors. For example, authors usually submit their manuscripts first to the most prestigious journals in the field (e.g., those with the highest impact factors) and then work their way down the hierarchy. This phenomenon, referred to as journal shopping, can cause a delay from a few days to more than eight months [16]. The increasing trend of journals and reviewers requiring greater amount of data for publication may also lead to multiple

revisions and subsequently, longer publication delays. Last but not the least, some journals deliberately extend their publication delays to boost the impact factors by accumulating more citations before official publication. This is because the calculation of a journal's impact factor is mainly based on the date of publication of its articles in print form [17]. These factors, although not specifically investigated in this study, should also be aware by each researcher.

Admittedly, the results of the current study should be interpreted with some caution. The major caveat was the selection bias of journals, although much effort has been taken to prevent such bias. First, only journals indexed by JCR under the categories of "OTORHINOLARYNGOLOGY" and "AUDIOLOGY AND SPEECH-LANGUAGE PATHOLOGY" were selected in the current study. Such list, albeit consisting of the vast majority of popular journals in the fields, might still have missed some journals that are newly launched or across fields (e.g. maxillofacial surgery, head and neck oncology). In this regard, the SJR generally provides a broader range of journals under the same category compared to the JCR. Thus, the SJR may be used as an alternative source for journal selection. Second, data were extracted only from those journals that reported the dates of submission and acceptance. It was possible that those journals did not report this information because they had longer publication delays. As a result of both limitations, the final data analysis was conducted in only 30 journals, while the total number of journals in the studied fields exceeds 100 according to the SJR.

Another minor concern was present in the search strategy using the R package "RISmed". In this package, there are series of commands that allow users to extract different time information

regarding the publication history from each Medline record. The information includes dates of online publishing, print publishing, or record entry to PubMed database, etc. Oddly, most Medline records did not contain the history of first-time publication. For journals that published papers both online and in print, the publication date of a paper would be updated by replacing the previous time information with a more recent one (usually the time when it got published in print). If such information was used, it would bring in a huge systematic bias in calculating the publication delay in our study, as the publication time was defined as the date of first-time publishing of a paper in any form. Fortunately, the bibliographic record of a paper was typically entered into the PubMed database a few days after its first-time publication, and this time information would stay unchanged afterwards, even if the paper was published in another form at a later time. Therefore, the entry time into PubMed database, although a few days apart, still provided the best estimate of the earliest publication time of a paper. In this regard, all the delays in the editorial phase and the entire publication in this study may minimally overestimate the actual time lapses by a few days. Alternatively, in this study, the publication time of a paper could be interpreted as the time when its record became available in PubMed.

Some improvements in practice may be inferred from the current study to minimize the publication delays in peer-review journals. First of all, traditional journals are encouraged to publish their accepted manuscripts online, as pre-prints help to promote papers' visibility thus reducing the publication delay. In fact, growing numbers of traditional publishers have started to post pre-prints on their websites. The sooner a research gets into the public domain, the more it benefits from the collective power of different

brains. Second, open access journals should increase their efficiency in editorial processing of the accepted manuscript in order to improve the publication speed. Last but not the least, all journals of otolaryngology, audiology and speech language pathology are encouraged to provide information regarding the publication history of their papers. This information would help authors to understand the publication delay of a specific journal or discipline. In this way, the authors would be able to select the most appropriate journal for submission of their manuscripts.

CONCLUSION

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The average publication delay for all journals of otolaryngology, audiology and speech language pathology was about 7 months. The peer review process was the major aspect in determining the publication delay. Several factors, such as the impact factor, journal size, publication frequency, subscription type as well as geographical region, were found to affect the delay in each phase of the entire publication process.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Table 1. Journals indexed in the JCR under the categories of otolaryngology, audiology and speech language pathology

HEARING RESEARCH	AMERICAN JOURNAL OF SPEECH-LANGUAGE PATHOLOGY
BRAIN AND LANGUAGE	JOURNAL OF THE AMERICAN ACADEMY OF AUDIOLOGY
JARO-JOURNAL OF THE ASSOCIATION FOR RESEARCH IN OTOLARYNGOLOGY	JOURNAL OF COMMUNICATION DISORDERS
AUGMENTATIVE AND ALTERNATIVE COMMUNICATION	OTOLARYNGOLOGIC CLINICS OF NORTH AMERICA
HEAD AND NECK-JOURNAL FOR THE SCIENCES AND SPECIALTIES OF THE HEAD AND NECK	ANNALS OF OTOTOLOGY RHINOLOGY AND LARYNGOLOGY
JAMA OTOLARYNGOLOGY-HEAD & NECK SURGERY	ACTA OTO-LARYNGOLOGICA
CLINICAL OTOLARYNGOLOGY	AMERICAN JOURNAL OF AUDIOLOGY
EAR AND HEARING	INTERNATIONAL JOURNAL OF PEDIATRIC OTORHINOLARYNGOLOGY
TRENDS IN AMPLIFICATION	JOURNAL OF VOICE
INTERNATIONAL FORUM OF ALLERGY & RHINOLOGY	JOURNAL OF VESTIBULAR RESEARCH-EQUILIBRIUM & ORIENTATION
LARYNGOSCOPE	LANGUAGE AND SPEECH
TRENDS IN HEARING	AURIS NASUS LARYNX
JOURNAL OF FLUENCY DISORDERS	ORL-JOURNAL FOR OTO-RHINO-LARYNGOLOGY HEAD AND NECK SURGERY
OTOLARYNGOLOGY-HEAD AND NECK SURGERY	INTERNATIONAL JOURNAL OF SPEECH-LANGUAGE PATHOLOGY
AMERICAN JOURNAL OF RHINOLOGY & ALLERGY	EUROPEAN ANNALS OF OTORHINOLARYNGOLOGY-HEAD AND NECK DISEASES
OTOLOGY & NEUROTOLOGY	AMERICAN JOURNAL OF OTOLARYNGOLOGY
NOISE & HEALTH	ENT-EAR NOSE & THROAT JOURNAL
INTERNATIONAL JOURNAL OF LANGUAGE & COMMUNICATION DISORDERS	SEMINARS IN SPEECH AND LANGUAGE
AUDIOLOGY AND NEURO-OTOLOGY	CLINICAL AND EXPERIMENTAL OTORHINOLARYNGOLOGY
DYSPHAGIA	HNO

RHINOLOGY	LOGOPEDICS PHONIASTRICS VOCOLOGY
INTERNATIONAL JOURNAL OF AUDIOLOGY	JOURNAL OF LARYNGOLOGY AND OTOLOGY
EUROPEAN ARCHIVES OF OTO-RHINO-LARYNGOLOGY	BRAZILIAN JOURNAL OF OTORHINOLARYNGOLOGY
CURRENT OPINION IN OTOLARYNGOLOGY & HEAD AND NECK SURGERY	CLINICAL LINGUISTICS & PHONETICS
JOURNAL OF OTOLARYNGOLOGY-HEAD & NECK SURGERY	LARYNGO-RHINO-OTOLOGIE
JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA	B-ENT
ACTA OTORHINOLARYNGOLOGICA ITALICA	PHONETICA
JOURNAL OF SPEECH LANGUAGE AND HEARING RESEARCH	FOLIA PHONIASTRICA ET LOGOPAEDICA
LANGUAGE COGNITION AND NEUROSCIENCE	JOURNAL OF INTERNATIONAL ADVANCED OTOLOGY

Journals in bold letter reported information regarding the full publication history of their papers. These papers were further analyzed to access the publication delays.

Table 2. Summary of journals included in data analysis

Journal Title Abbreviation	Impact factor (2015)	# publications 2013-2015	Journal type	Geographical region	Issues /Year	Publisher	# articles for data analysis
Acta Otorhinolaryngol Ital	1.531	198	OA	Europe	6	Pacini editore	463
Am J Audiol	1.125	129	Sub	USA	4	ASHA	140
Am J Otolaryngol	0.933	511	Sub	Europe	6	Saunders	1361
Am J Speech Lang Pathol	1.413	162	Sub	USA	4	ASHA	168
Audiol Neurootol	1.776	133	Sub	Europe	6	Karger	446
Auris Nasus Larynx	1.038	396	Sub	Europe	6	Elsevier	1302
Brain and Language	3.038	383	Sub	USA	12	Elsevier	897
Braz J Otorhinolaryngol	0.730	423	OA	Other	6	ENT Brazil	1367
Clin Exp Otorhinolaryngol	0.855	185	OA	Other	4	KORLHNS	519
Clin Otolaryngol	2.627	371	Sub	Europe	6	Blackwell	52
Dysphagia	1.754	363	Sub	USA	6	Springer	622
Eur Ann Otorhinolaryngol Head Neck Dis	0.942	279	Sub	Europe	6	Elsevier	389
Eur Arch Otorhinolaryngol	1.627	1727	Sub	Europe	12	Springer	4072
Folia Phoniatr Logop	0.391	130	Sub	Europe	6	Karger	8
Head Neck	2.760	948	Sub	USA	12	Wiley	1019
Hearing Research	3.565	459	Sub	Europe	12	Elsevier	1671
Int Forum Allergy Rhinol	2.350	464	Sub	USA	12	Wiley	900
Int J Lang Commun Disord	1.798	196	Sub	Europe	6	Wiley	186
Int J Pediatr Otorhinolaryngol	1.125	1334	Sub	Europe	12	Elsevier	3667
J Assoc Res Otolaryngol	3.030	200	Sub	USA	6	Springer	542
J Commun Disord	1.278	124	Sub	USA	6	Elsevier	377
J Fluency Disord	2.022	85	Sub	USA	4	Elsevier	234

J Otolaryngol Head Neck Surg	1.585	224	OA	Europe	6	BioMed Central	236
J Speech Lang Hear Res	1.526	486	Sub	USA	6	ASHA	397
J Voice	1.113	540	Sub	USA	4	Mosby	1558
Lang Cogn Neurosci (Process)	1.470	294	Sub	USA	10	Taylor & Francis	11
Laryngoscope	2.272	1870	Sub	USA	12	Wiley	2659
ORL J Otorhinolaryngol Relat Spec	1.000	168	Sub	Europe	6	Karger	425
Otolaryngol Head Neck Surg	2.021	1222	Sub	USA	12	Sage	2286
Phonetica	0.458	48	Sub	Europe	4	Karger	110

Journal type: Sub-Subscription; OA-Open Access

Table 3 Intraclass correlation coefficients between publication delays and journal factors

	Journal factors				
	Impact factor	Annual publications	Publication frequency	Subscription type	Geographical region
Acceptance delay	0.23 (0.16-0.36)	0.23 (0.16-0.35)	0.04 (0.01-0.36)	0.004 (0.0006-0.81)	0.04 (0.01-0.61)
Editorial delay	0.42 (0.31-0.57)	0.42 (0.32-0.57)	0.23 (0.09-0.81)	0.65 (0.27-1)	0.35 (0.12-0.95)
Publication delay	0.33 (0.24-0.48)	0.33 (0.24-0.48)	0.22 (0.08-0.80)	0.5 (0.17-1)	0.26 (0.09-0.93)

All data were expressed by mean (95% confidence interval).

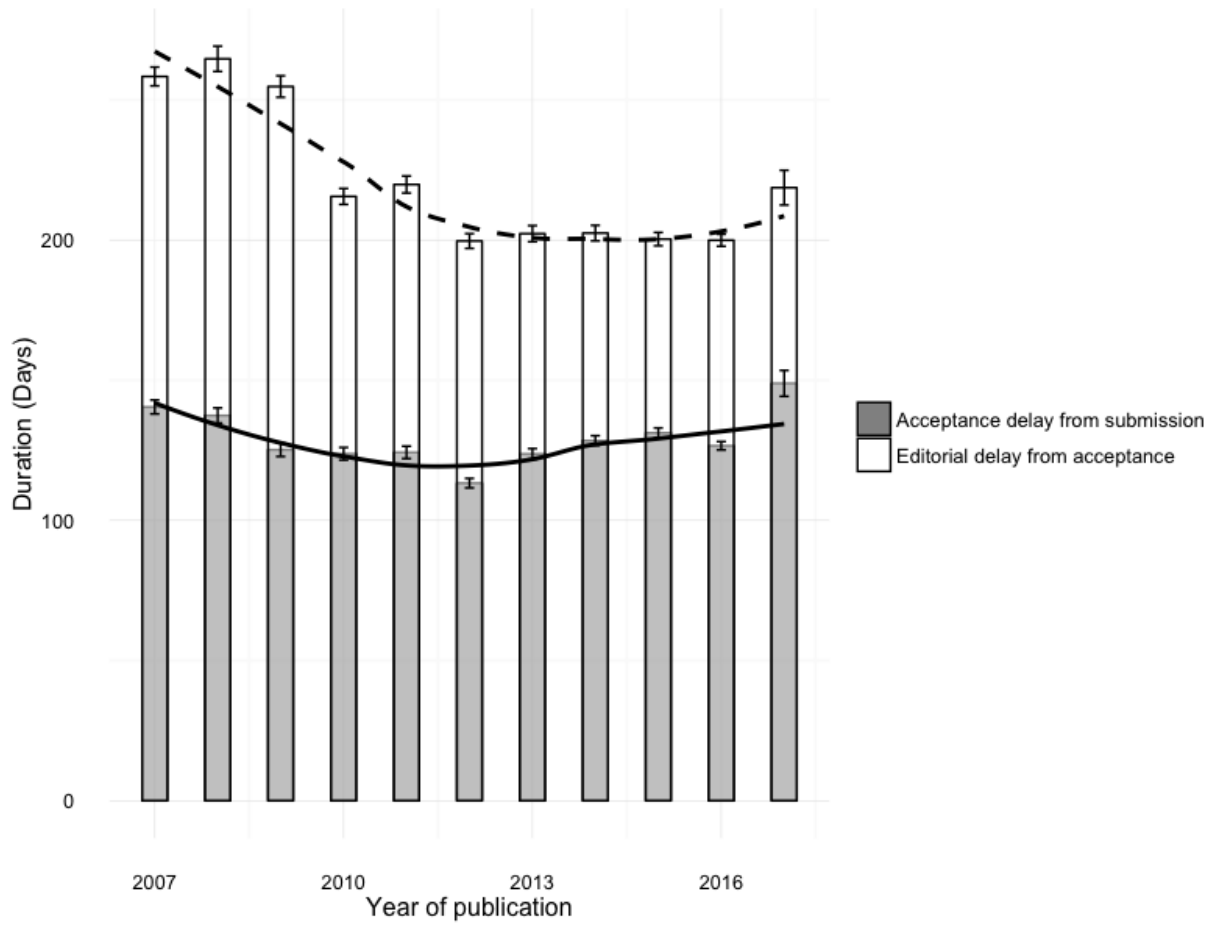


Figure 1. The average delay in each phase of publication of all journals for each of the past ten years. The error bar represents the standard error of the mean.

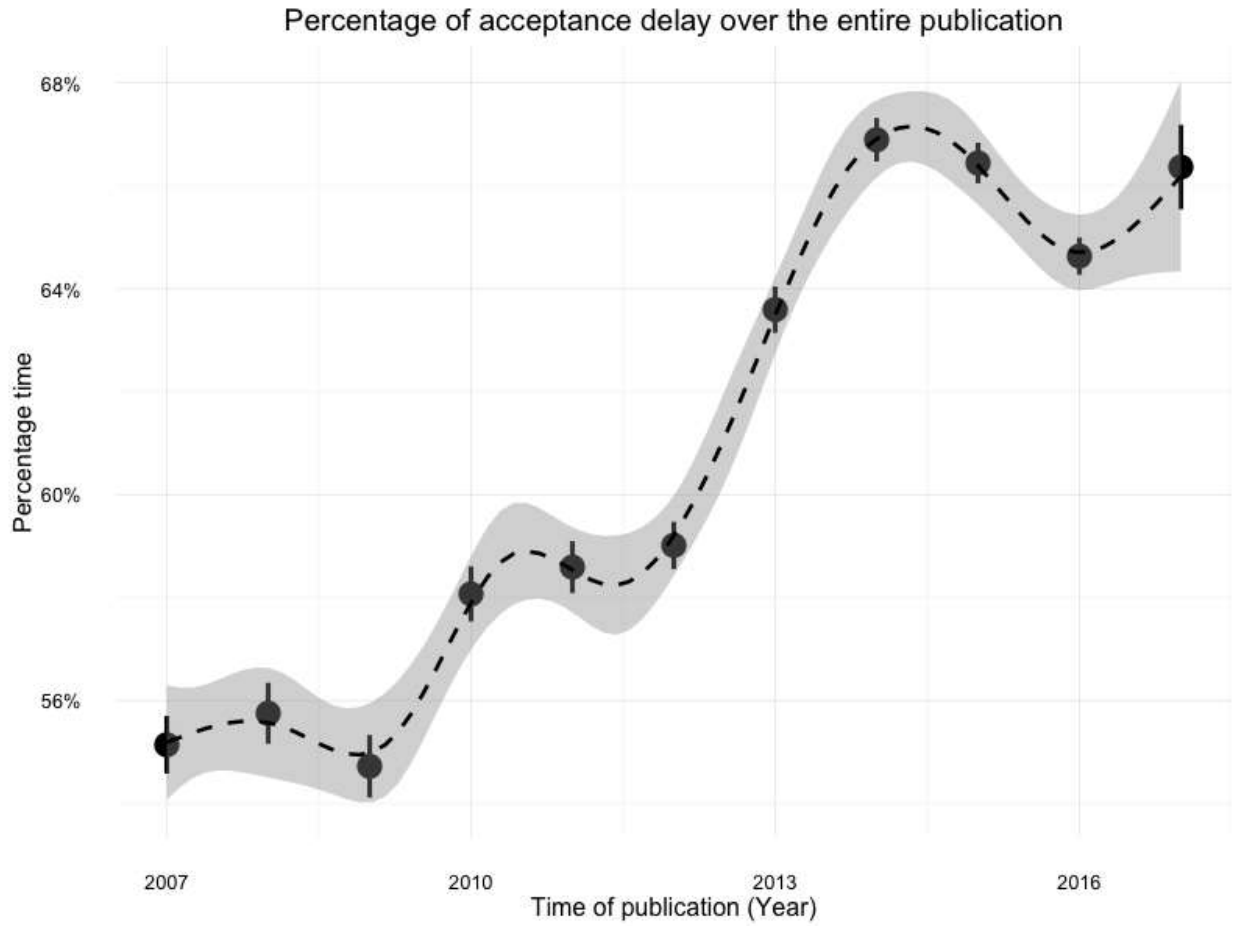


Figure 2. The ratio of the acceptance delay over the total publication delay in each year from 2007-2017. The grey ribbon indicates 95% confidence interval of the mean. The error bar represents the standard error of the mean.

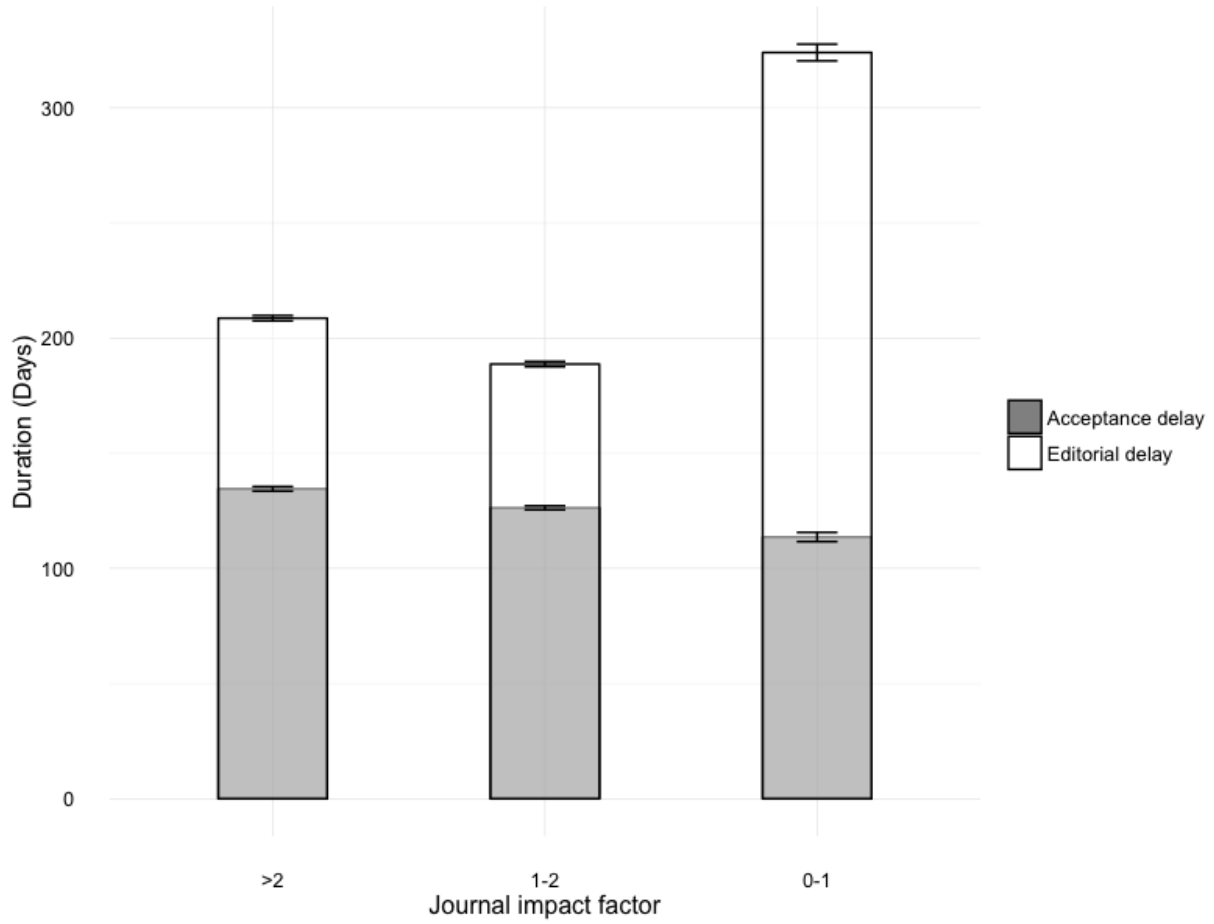


Figure 3. The delay in each publication phase in journals with different ranges of impact factors. The error bar represents the standard error of the mean.

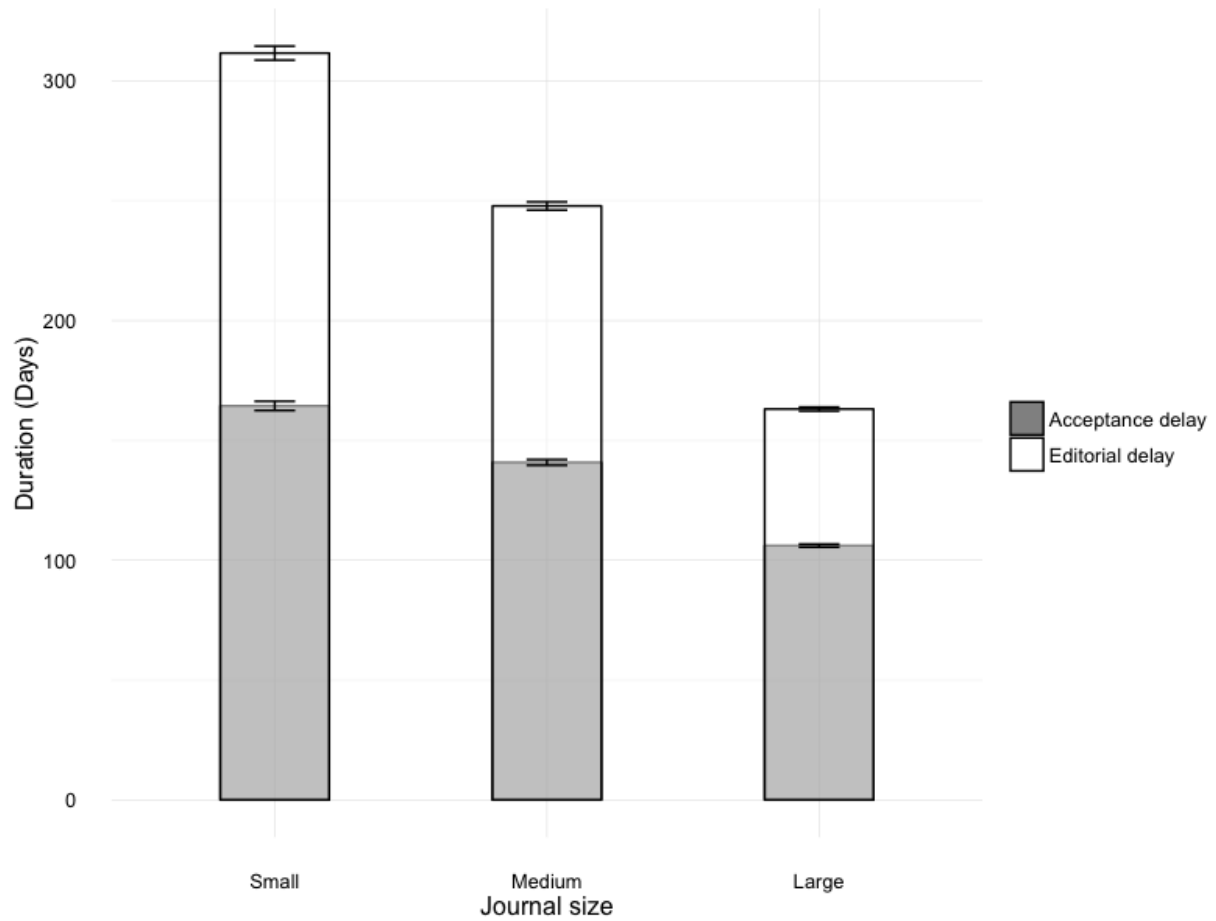


Figure 4. The delay in each publication phase in journals of different sizes which are indicated by the annual numbers of published articles. Small: ≤ 100 ; medium: 100-200; large: >200 . The error bar represents the standard error of the mean.

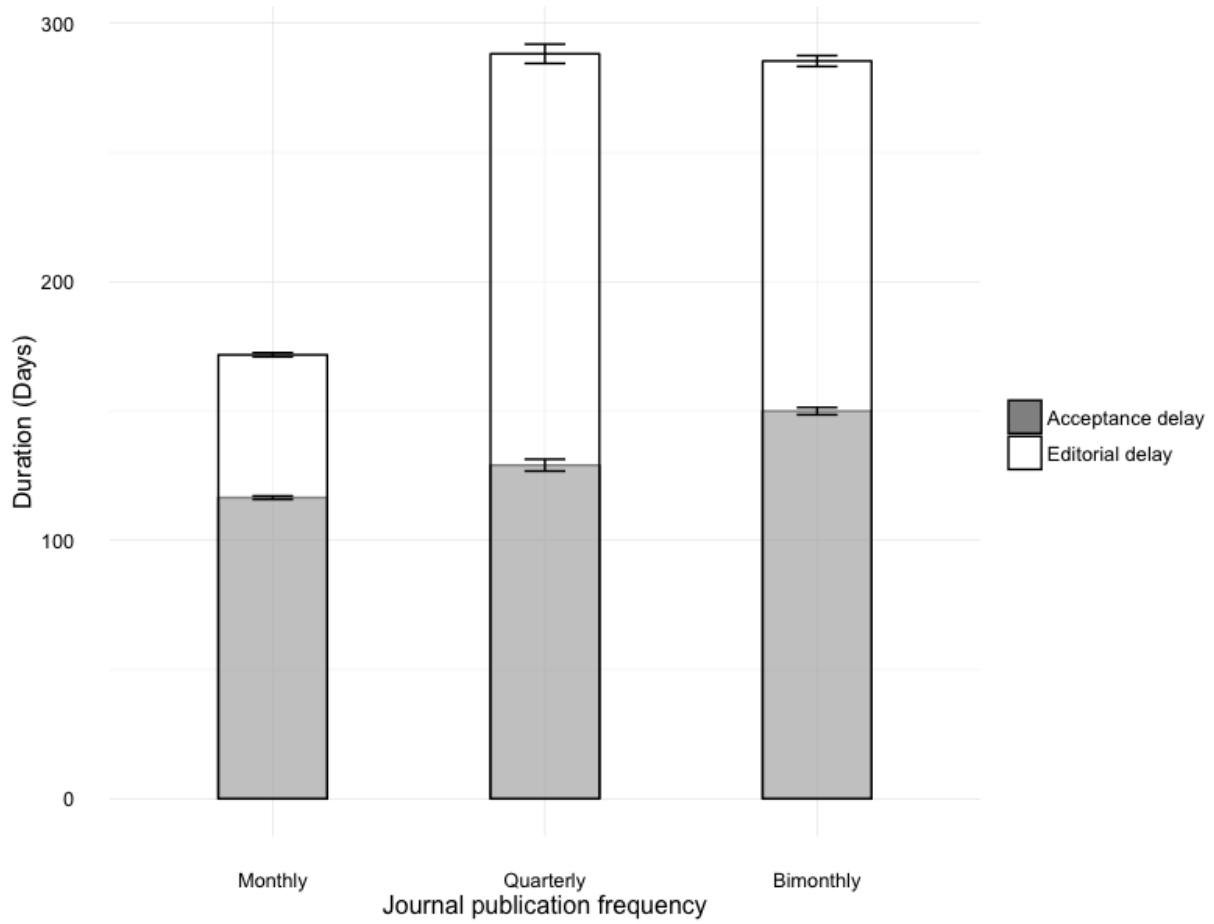


Figure 5. The delay in each publication phase in journals with different publication frequencies. The error bar represents the standard error of the mean.

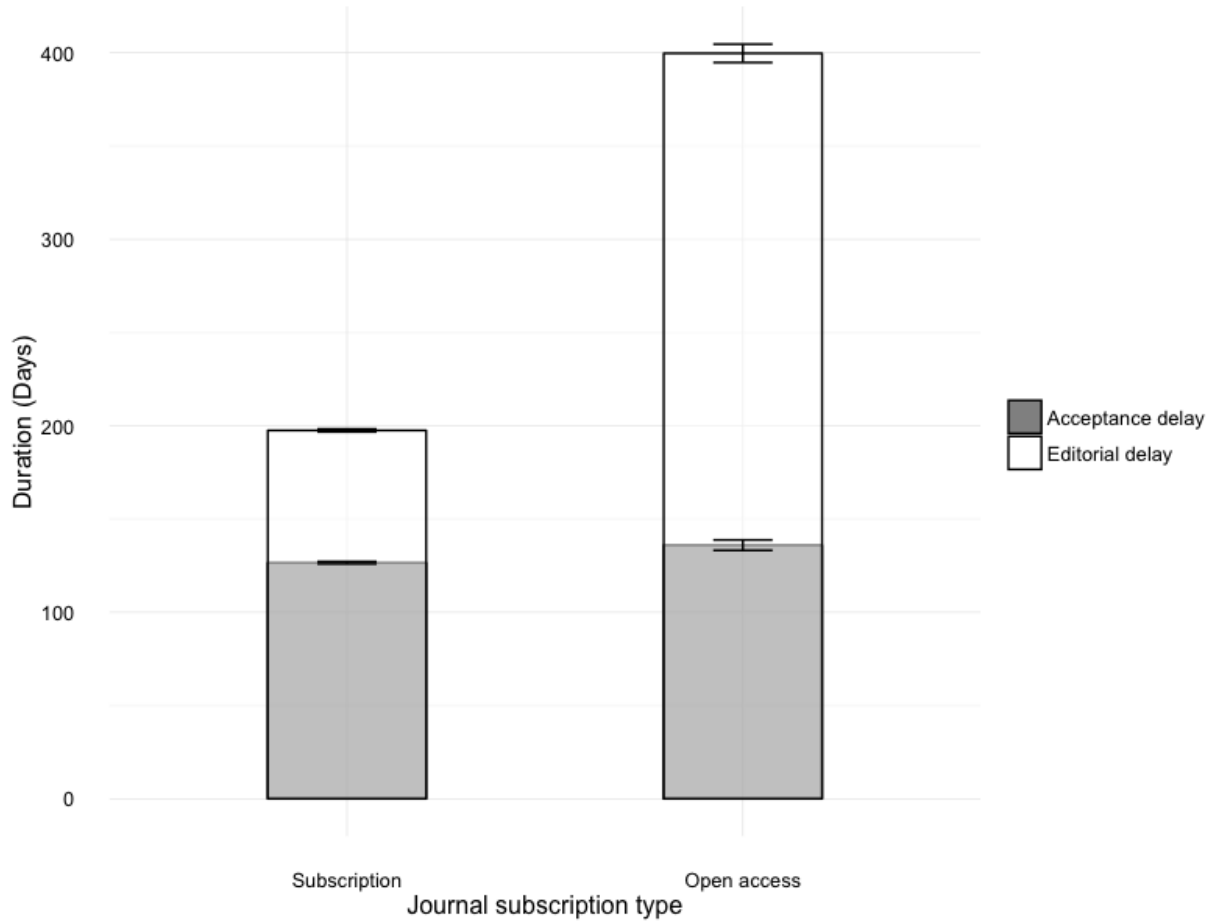


Figure 6. The delay in each publication phase in traditional subscription journals and open access journals. The error bar represents the standard error of the mean.

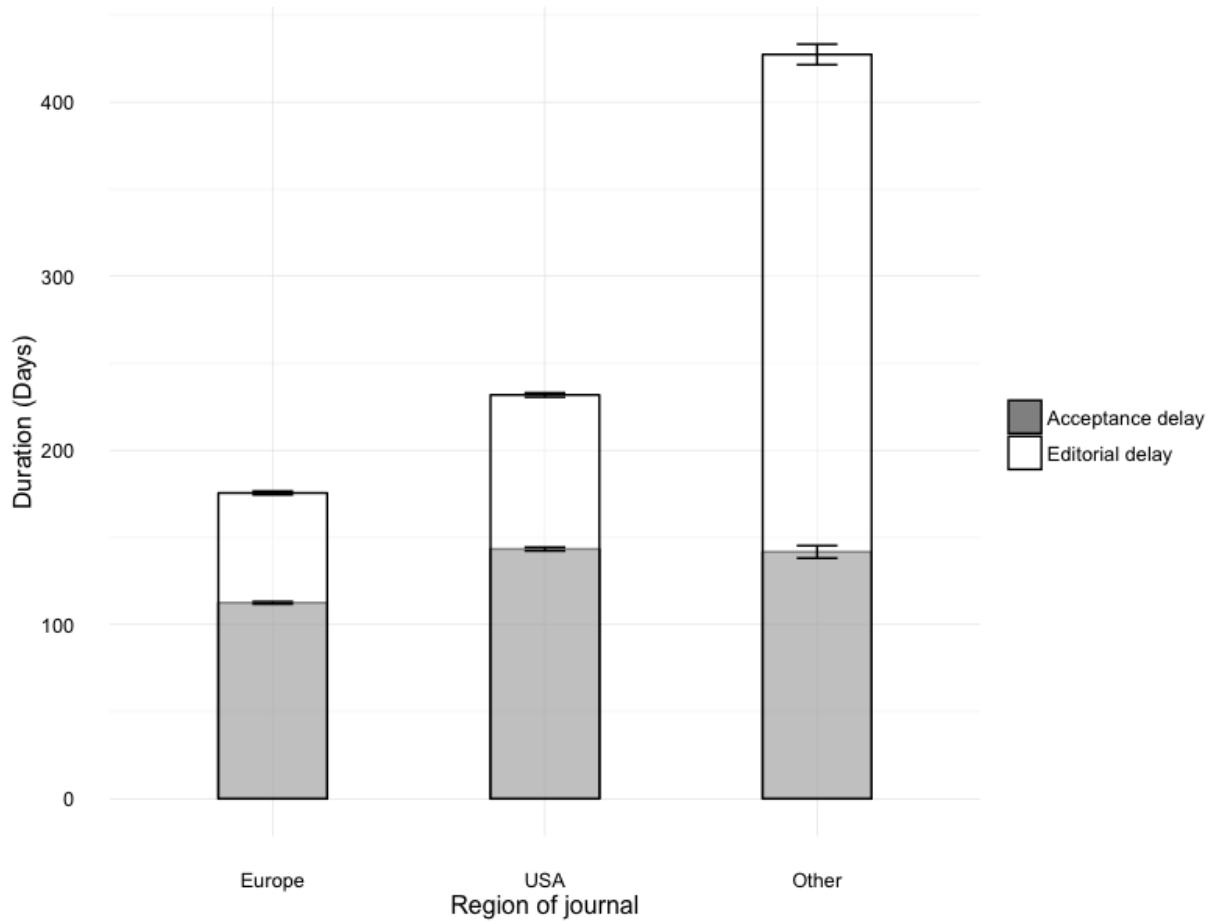


Figure 7. The delay in each publication phase of journals from different geographical regions. The error bar represents the standard error of the mean.

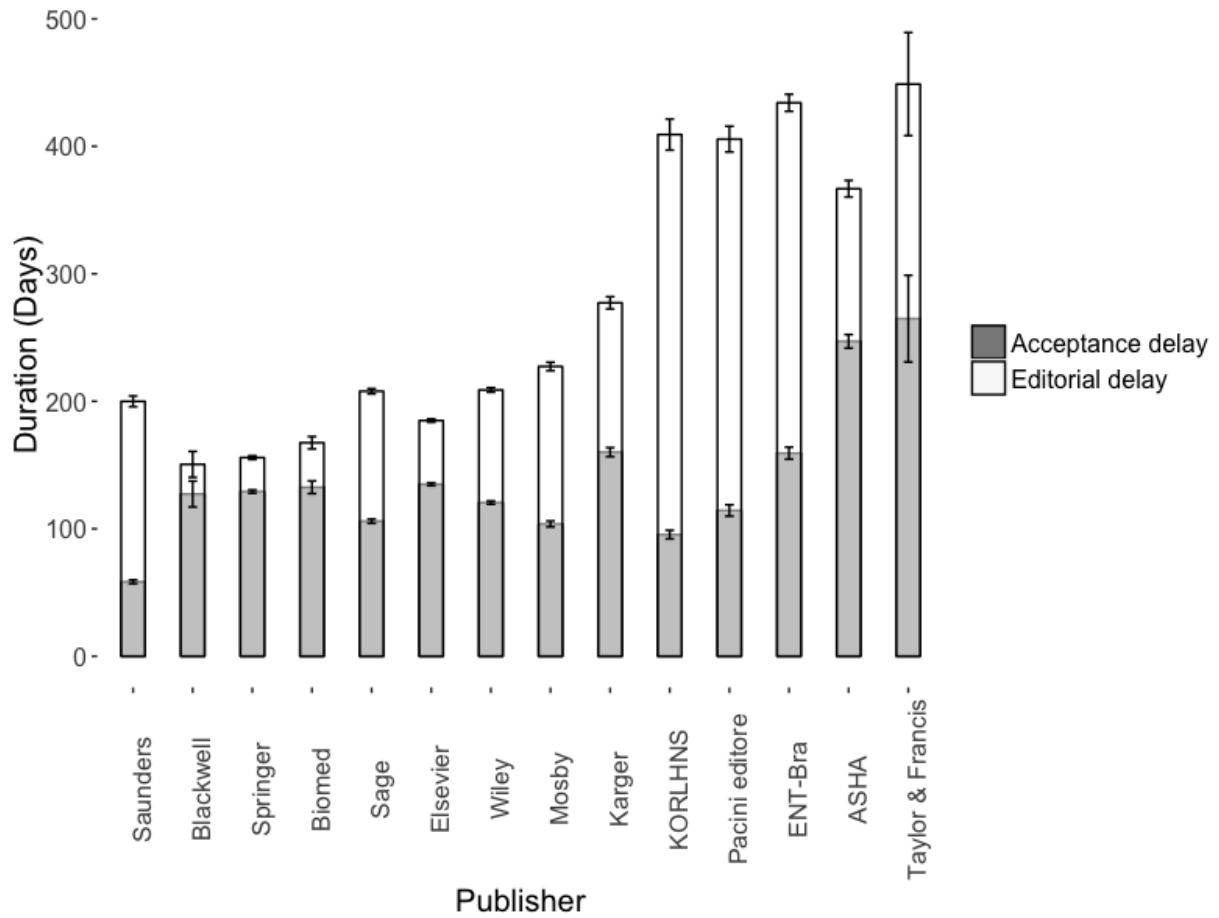


Figure 8. The delay in each publication phase of different publishers. The error bar represents the standard error of the mean.

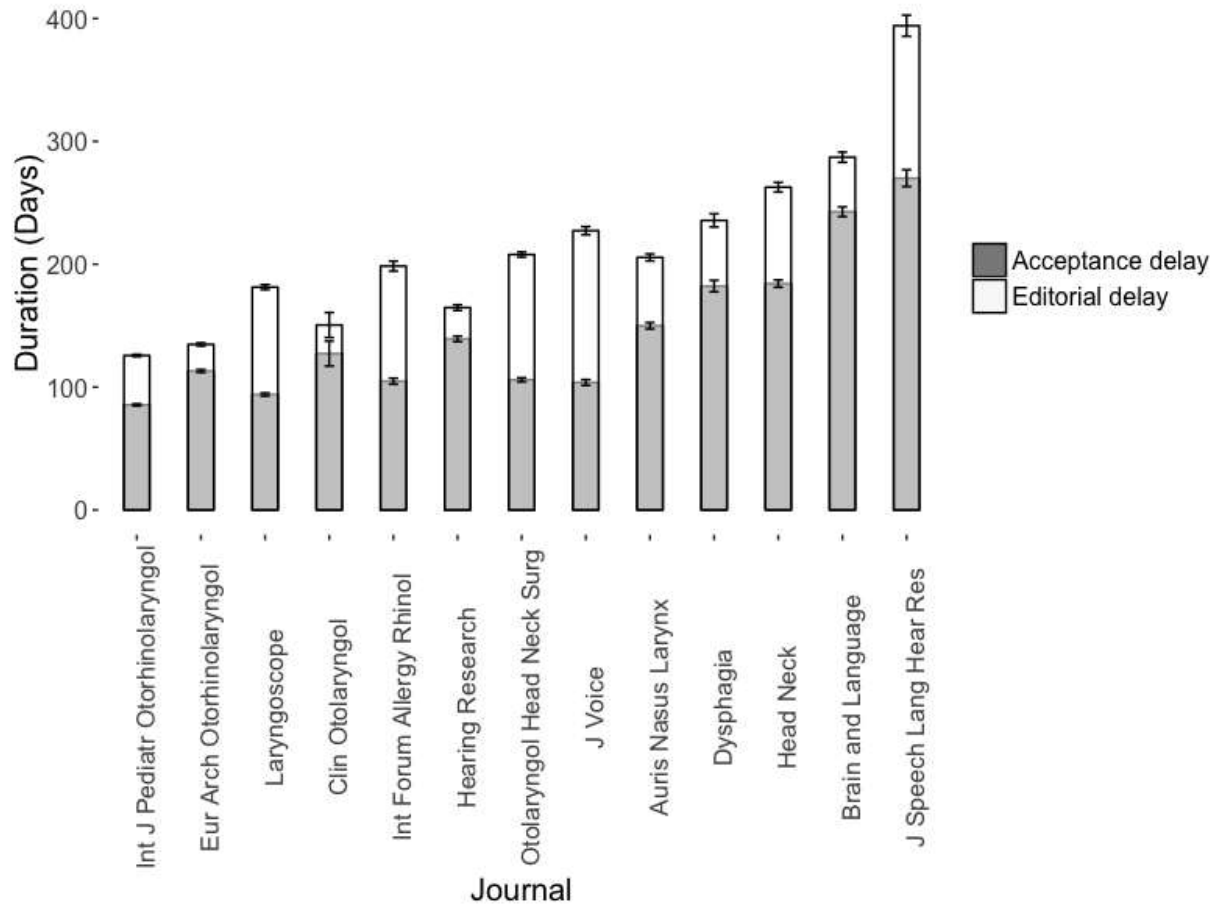


Figure 9. The delay in each publication phase of several journals in the field of otolaryngology, head and neck surgery, audiology, and speech language pathology. The error bar represents the standard error of the mean.

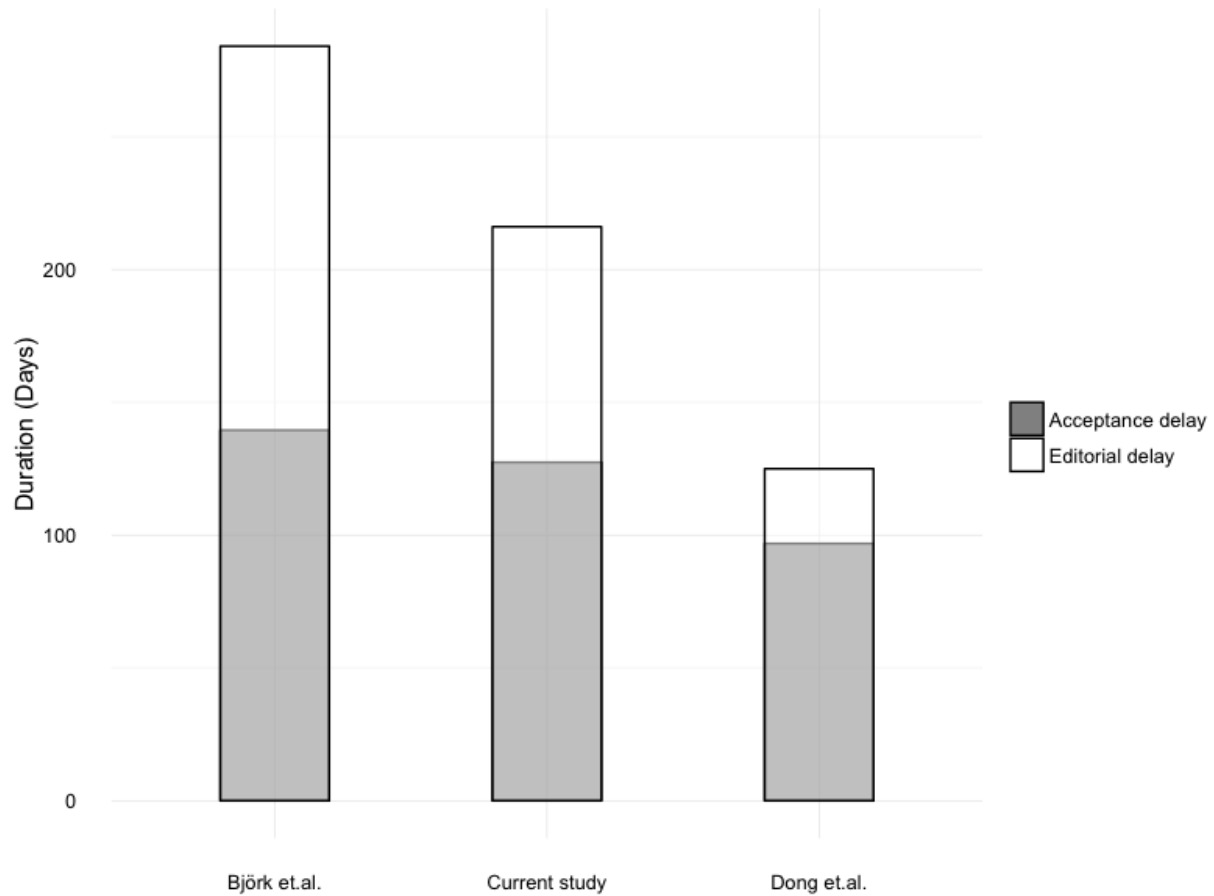


Figure 10. The delay in each publication phase in biomedical journals from 3 different studies. The study from Dong et.al., assessed 12 journals published by either Nature Publishing Group or BioMed Central. In the study by Björk et.al., only 15 journals with different sizes were randomly selected to assess the publication delay in biomedical journals. In the current study, data were sampled from a total of 30 journals in otolaryngology, audiology and speech language pathology.