

Analysis of predatory emails in early career academia and attempts at prevention

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Abstract: Predatory publishers—those who do not adhere to rigorous standards of academic practice such as peer review—are increasingly infiltrating biomedical databases, to the detriment of the wider scientific community. These publishers frequently send unsolicited ‘spam’ emails to generate submission to their journals, with early career researchers (ECR) particularly susceptible to these practices because of pressures such as securing employment and promotion. This analysis sought to record and characterize the emails received over the course of a PhD and post-doctoral position (~8 years), as well as attempts to unsubscribe from such emails, using a progressive and step-wise manner. A total of 1,280 emails identified as academic spam were received (990 journal invitations, 220 conference invitations, 70 ‘other’). The first email was received 3 months after registration for an international conference. Attempts at unsubscribing were somewhat effective, whereby implications of reporting to respective authorities resulted in a 43% decrease in emails, although did not eliminate them completely, and therefore alternative approaches to eliminating academic spam may be needed. Ongoing education about predatory publishers, as well as action by key academic stakeholders, should look to reduce the impact these predatory publishers have upon the wider literature base.

Keywords: academic practice, publishing, unsolicited email

INTRODUCTION

Academic publishing is evolving at an unprecedented rate, with increasing numbers of authors, publications and journals, as well as metrics to quantitatively compare outputs, individuals and institutions (Fire & Guestrin, 2019). This changing landscape has given rise to illegitimate publishers (also referred to ‘potentially predatory publishers’), seeking to exploit this need for continued publication—to the detriment of individual academics and the wider scientific community (Johal et al., 2017).

These illegitimate publishers refer to companies or groups who publish academic material, but do not adhere to the same academic rigour of independent peer review, typically focusing on charging large open-access fees for the right to publish work. This can include publishers who are explicitly predatory in their solicitation approach; publishers that have questionable business practices; and publishers that ‘hijack’ the name of a well-established journal and use counterfeit practices to obtain submissions (Beall, 2016). Whilst all these types of illegitimate journals have differing operating practices, and thus a

standardized definition is lacking, they are united in the use of false and misleading information, deviation from best academic practice, and a lack of transparency. Thus, as a collective, the term ‘predatory publisher’ has become recognized within the academic community to describe these publishers and is used herein (Grudniewicz et al., 2019).

Articles published in predatory journals are often deficient in reporting of methods, including obtaining ethical permission for studies to take place (Moher et al., 2017), thus eroding the credibility of the literature base (Forero et al., 2018). Willingly submitting work to such predatory publishers—and thus likely bypassing peer review—has been suggested to be a form of academic misconduct (Yeo-Teh & Tang, 2021) and therefore should be avoided by all.

The predatory model can result in a substantial number of unsolicited emails being received by researchers (Krasowski et al., 2019), the volume of which can negatively impact upon day to day working practices (Wood & Krasowski, 2020) and incur significant costs in lost productivity (Teixeira da Silva et al., 2020). Previous analyses have sought to quantify this volume of emails received, with observation periods spanning periods from only a few weeks (Lund & Wang, 2020; Wood & Krasowski, 2020), to months (Clemons et al., 2017; Dagens, 2019) and years (Kakamad et al., 2021; Mercier et al., 2018; Sousa et al., 2021), although such observations over a full academic career have yet to be described.

Moreover, there appears to be an association between academic rank, history of open access publishing, and volume of unsolicited email received, whereby senior academics receive more unsolicited emails than junior academics (Krasowski et al., 2019; Wilkinson et al., 2019). However, early career researchers (ECR) are not immune to this burden of unsolicited email, and a series of pressures facing ECRs, such as securing permanent employment and academic promotion (Richards et al., 2021), can result in them unwittingly falling victim to such practices (Mertkan et al., 2021).

Attempts to unsubscribe from such emails have been characterized in the past (Grey et al., 2016; Mazzarello et al., 2016), although there does not appear to be a universally robust methods that wholly prevents all unsolicited emails. An analysis from Mazzarello et al. (2016) creatively used a change in Canadian national legislation to tell senders that emails would be reported to a national body that has the power to fine them. This resulted in all further emails being stopped in a highly effective method, although it is unclear whether such national legislation has widespread effects of on all unsolicited emails (Osborne & Kunz, 2005).

However, to date there are no descriptive analyses of accumulation of unsolicited emails over the course of a full early academic career alongside attempts to unsubscribe from such emails. Therefore, this analysis sought to replicate the analyses utilized by Mercier et al. (2018), in describing the volume of unsolicited communication received by an ECR, but to also incorporate unsubscribing techniques from Mazzarello et al. (2016), to determine efficacy in reducing the number of emails received.

Key points

- 1,280 spam emails were received during a 5-year period starting with the first conference attendance—no emails were received until this point in the author’s career.
- Spam emails from potentially predatory journals and conferences can be directly related to academic activity—conference attendance and publications.
- The 990 spam emails from journals came from 111 publishers, of which 22 were from the State of Delaware (USA), with 6 publishers providing the same postal address.
- Requests to unsubscribe from unsolicited emails have some success, but is limited since there is little action that can be taken against the publishers or journals.

METHODS

Collation of predatory email

All unsolicited email invitations related to academic activities were collated and analysed. Any unsolicited emails that were not academically related (e.g., generalized marketing ‘spam’) were excluded from this analysis. Emails were collated from the beginning of the author’s doctoral studies (September 2013) to the end of their post-doctoral position (December 2021), both of which were at the same institution and used the same email address for all correspondence. All collated emails were then divided into three categories for analysis: journal invitations, conference invitations, and miscellaneous ‘other’ invitations (such as webinars, e-books, and undertaking peer-review).

Verification of predatory email

Emails soliciting for submissions to journals were checked against an archived version of Beall’s list (Beall, n.d.), and those that were not on this list were checked against the criteria of Beall (Beall, 2015). This checklist is extensive, and is based upon two documents from the Committee on Publication Ethics (COPE, n.d.)—‘Principles of Transparency and Best Practice in Scholarly Publishing’, and ‘Code of Conduct for Journal Publishers’. This checklist includes criteria related to the editorial board and staff, business management, integrity and poor journal standards and practices. For emails soliciting submission to a conference, McCrostie’s criteria were utilized (Cress, 2017). Once verified, details were extracted from each email, including previous details characterized by Mercier et al. (2018).

Removal from email listings

All emails received from January 2021 to December 2021 were subsequently subject to a series of attempts to unsubscribe, occurring in an increasingly proactive manner, with each phase

lasting 4 months each. For the first phase (January 2021–April 2021), within emails where an ‘unsubscribe’ button was included, this was used to attempt to unsubscribe. The second phase (May 2021–August 2021), was the same as the first step, but in addition, where emails had an unsubscribe option written within the email body (e.g., ‘If you would like to unsubscribe, please email unsubscribe@domain.com’), this address was then emailed with ‘unsubscribe’ as the sole email subject and correspondence. The third phase (September 2021 - December 2021) was the same as the first two phases, but in addition, all emails received were replied to using a letter as provided in Supplemental File 1, referring to legal implications of continued unsolicited emails via reporting to the United Kingdom (UK) Information Commissioners Office (ICO).

This latter approach was inspired by a similar approach from Mazzarello et al. (2016) who threatened legal action if unsolicited emails continued. However, the current approach utilized more ambiguous language (i.e., ‘emails may be reported’; not ‘emails will be reported’) to avoid any genuine legal concerns, and at time of publication, no details had been passed to the ICO.

Analysis

Analyses utilized descriptive statistics to quantify each aforementioned characteristic (Microsoft Excel; Microsoft), with figures detailing data on a month-by-month basis.

RESULTS

During the period from September 2013 to December 2021, encompassing the author’s PhD and post-doctoral training years, a total of 1,280 emails were identified as academic spam. This included journal invitations ($n = 990$), conference invitations ($n = 220$), and a collection of miscellaneous ‘other’ invitations ($n = 70$). These ‘other’ invitations included invitations to conduct peer review ($n = 21$), invitations to write books/chapters ($n = 16$), invitations to join editorial boards ($n = 10$), invitations to present webinars ($n = 10$), solicitation of academic services ($n = 8$), and invitations to re-publish previously published manuscripts ($n = 5$).

The first of these emails was received in April 2018, 3 months after the author had submitted an abstract (and contact details) to an international conference. Moreover, a notable increase in the volume of emails was noted early in 2020, shortly after the publication of two articles (Tomlinson et al., 2020; Tomlinson & Vlachopoulos, 2020) whereby the author’s email was provided as correspondence.

Characteristics of emails received requesting submission to journals and conferences are provided in Tables 1 and 2, respectively. Of the $n = 990$ journal submission invitations received, a total of $n = 797$ were from publishers listed on the archived version of Beall’s list (Beall, n.d.), and the remaining $n = 193$ being from publishers who fulfilled Bealls criteria (Beall, 2015). A total of $n = 111$ unique publishers were identified.

TABLE 1 Characteristics of unsolicited emails inviting to submit journal articles.

Information included in email	Included, n (%)	Not Included, n (%)
Deadline to submit manuscript	529 (53)	461 (47)
Peer review process	241 (24)	749 (76)
Submission guidelines	23 (2)	967 (98)
Options to submit manuscript ^a	634 (64)	356 (36)
Online only	183 (29)	
Email only	257 (41)	
Either online or email	194 (31)	
Types of manuscript accepted	374 (38)	616 (62)
Option to narrate manuscript	0 (0)	990 (100)
Open access business model	195 (20)	795 (80)
Impact factor	172 (17) 1.67 (± 1.05), 0.01–4.60 ^b	818 (83)
Publication fees or discount	133 (13)	857 (87)
Option to unsubscribe from emails	595 (60)	395 (40)
Mentions it is not a spam email	40 (4)	950 (96)
Sender’s name and correspondence	281 (28)	709 (72)

Note: Percentages may not always equal 100 due to rounding.
^a Breakdown percentages are provided as proportion of ‘Included’ responses.
^b Data presented as mean (± SD, minimum-maximum).

A breakdown of the proportion of each email category received on a monthly basis is provided in Fig. 1. In addition, a breakdown of specific types of emails are provided in Fig. 2, displaying both absolute counts and relative proportions—the latter of which indicates a shift towards predatory journals (away from conferences) following the publication of the aforementioned articles. As a result of these publications by the author, a total of $n = 230$ unsolicited journal invites made explicit reference to published works of the author. Moreover, of interest, there appears to be an impact of the COVID-19 pandemic upon unsolicited emails, whereby all of the online conference invitations were received from September 2020 onwards.

The location of the $n = 111$ identified predatory publishers is provided in Fig. 3, with the majority appearing to be in the USA. Of particular interest, most were based in the State of Delaware, with 6/22 publishers in the state (representing $n = 47$ different journals) providing the exact same office address.

During the year 2020, a total volume of $n = 563$ emails were received. Quantifying this absolute volume of emails received in 2020 allowed this year to act as a quasi-control year prior to 2021, whereby attempts to unsubscribe were made (i.e., no attempts to unsubscribe were made in 2020).

During the year 2021, a total volume of $n = 593$ emails were received (January–April, $n = 201$; May–August, $n = 249$;

TABLE 2 Characteristics of unsolicited emails inviting to submit to conferences.

Information included in email	Included, n (%)	Not Included, n (%)
Proposed role ^a	160 (73)	60 (27)
Speaker	106 (66)	
Chair/speaker	40 (25)	
Keynote speaker	3 (2)	
Honourable speaker	2 (1)	
Invited speaker	2 (1)	
Plenary speaker	2 (1)	
Delegate	1 (1)	
Panel speaker	1 (1)	
Speaker/delegate	1 (1)	
Speaker/organizing committee	1 (1)	
Speaker/workshop presenter	1 (1)	
Conference related fees	15 (7)	205 (93)
Option to unsubscribe	139 (63)	81 (37)
Mentions email is not spam	3 (1)	217 (99)
Sender's name and correspondence	39 (18)	181 (82)
Country of conference ^a	216 (98)	4 (2)
Japan	58 (27)	
Spain	22 (10)	
Greece	16 (7)	
Online conference	16 (7)	
Germany	14 (6)	
United Kingdom	14 (6)	
France	12 (6)	
Italy	12 (6)	
United Arab Emirates	12 (6)	
Netherlands	9 (3)	
Portugal	6 (3)	
Switzerland	5 (2)	
Canada	4 (2)	
China	4 (2)	
Australia	3 (1)	
Czech Republic	2 (1)	
Malaysia	2 (1)	
Austria	1 (0)	
Indonesia	1 (0)	
Korea	1 (0)	

TABLE 2 Continued

Information included in email	Included, n (%)	Not Included, n (%)
Singapore	1 (0)	
United States	1 (0)	

Note: Percentages may not always equal 100 due to rounding.

^aBreakdown percentages are provided as proportion of 'Included' responses.

September–December, $n = 143$). Therefore, this latter three months represents a 43% reduction in total email volume from the previous 3 months. Moreover, in 2021, email traffic from the most prolific publisher (who sent a total of $n = 108$ emails over the period of this analysis) decreased from $n = 54$ emails between May and August, to $n = 16$ during September–December; a relative decrease of 70%.

Of the attempts to unsubscribe, 40 were unsuccessful due to broken weblinks ($n = 3$), undeliverable email addresses ($n = 7$) and malicious websites detected by anti-virus software ($n = 30$). Only a single attempt at unsubscribing—using the technique of threatening reporting to the ICO—was acknowledged by the sender.

DISCUSSION

The purpose of this analysis was to quantify the amount of academic spam received over the course of an early academic career (PhD and post-doctoral study), as well the impact of attempts to unsubscribe from such emails. This analysis identified two notable increases in the volume of emails received, which are likely attributable to the author's first registration to an international conference, and publication of articles in which the author's correspondence was displayed. Moreover, attempts to unsubscribe and stop emails were met with mixed success, whereby the total number received did not diminish but responses that threaten reporting to the ICO appeared to somewhat reduce this number.

This analysis sought to replicate the early-career experience of Mercier et al. (2018), and thus act as a confirmatory study of the experiences of ECRs in academia with relation to predatory emails. The present work found a similar increase in unsolicited email following publication of manuscripts with available contact details, as well as the proportion of emails that contain certain information (e.g., open access business models, publication fees, options to unsubscribe, and correspondence details). This current analysis also identified the start of unsolicited emails after registration for an international conference. Whilst cause and effect must not be assumed, it is striking to note that most of the unsolicited conference invitations were for those in medical fields, aligning with the genuine conference to which the author was registered, only weeks prior to the enforcement of European General Data Protection Regulations (The European Parliament and the Council of the European Union, n.d.).

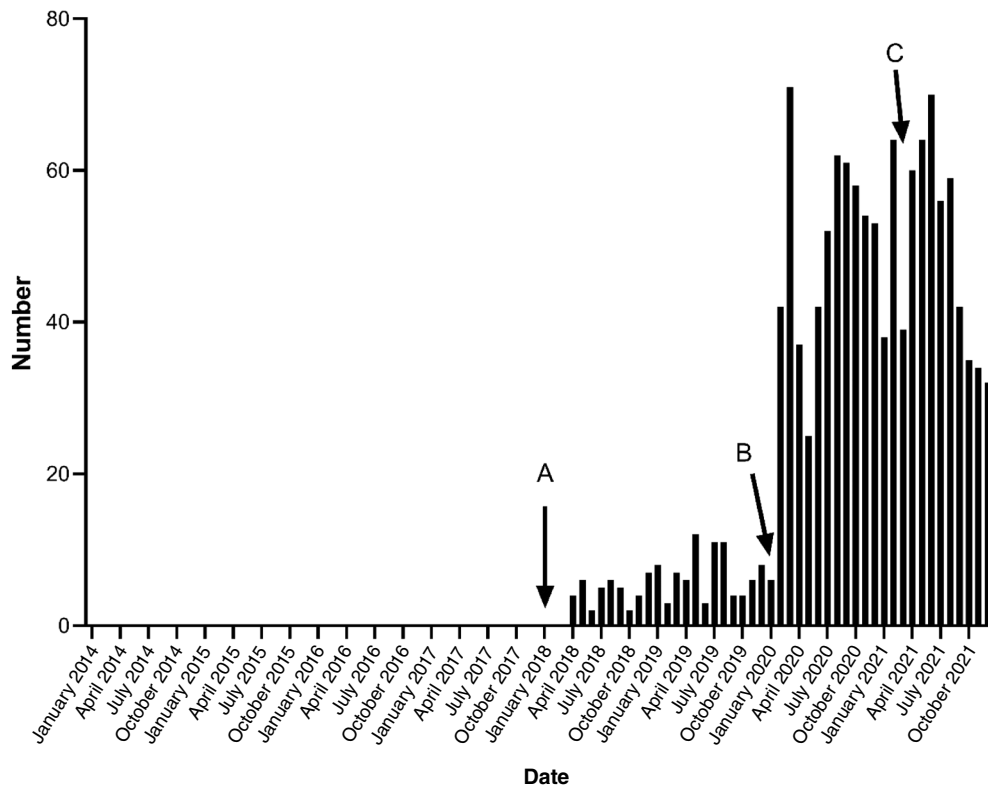


FIGURE 1 Total count of unsolicited emails received on a monthly basis, from start of PhD to end of post-doctoral contract. Count is combination of journal invitations, conference invitations and miscellaneous emails. (a) Authors first submission to an international conference. (b) Authors first publication with email listed as correspondence. (c) Start of attempts to unsubscribe from unsolicited emails.

Moreover, the novelty of this analysis was to not only replicate the analyses of Mercier et al. (2018), but to also replicate attempts to unsubscribe from such emails, as per Mazzarello et al. (2016). This latter study utilized changes in national legislation to

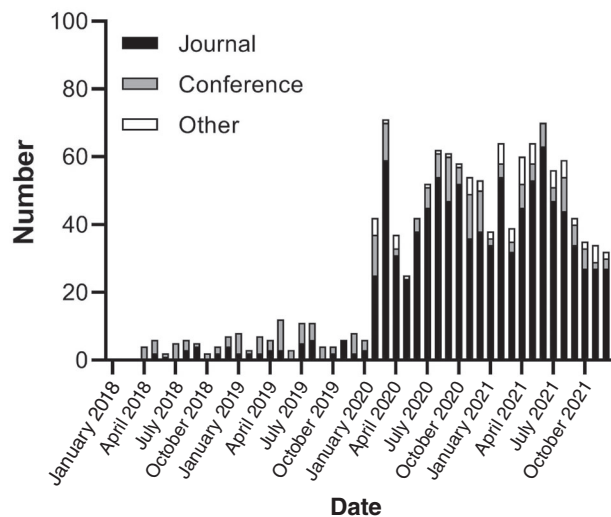


FIGURE 2 Total count of unsolicited emails, split into categories. Data only provided from January 2018, as first email was not received until April 2018.

effectively threaten a legal recourse if unsolicited emails did not stop, resulting in a complete cessation of unsolicited emails. However, the present analysis did not yield the same results, with only a 43% decrease in emails from the previous 4 months once legal action was implied. This may be due to a lack of firmer wording in the email, as legal action was only implied, not explicitly threatened, or potentially a lack of perceived threat by the sender as many publishers were located outside the United Kingdom and thus action would be unenforceable against them; reasons that are purely speculative. As only one acknowledgement was received, direct association between legal threats and decreased email traffic cannot be completely ascertained. Of interest, many publishers were (or appeared to be) located in the United States, with several giving the exact same address for offices in the state of Delaware—all likely taking advantage of legal and judiciary benefits in the state (State of Delaware, n.d.).

There has been a notable increase in the prevalence of predatory publishers and outputs over recent years (Shen & Björk, 2015), with many articles subsequently infiltrating biomedical databases and being indexed within them (Manca et al., 2020). Whilst many articles within these predatory publications remain uncited, some do attract a high citation count (Björk et al., 2020), which can create a worrying translation of supposed findings into patient care and clinical practice (Forero et al., 2018), particularly when peer review is not undertaken on many submissions, or is

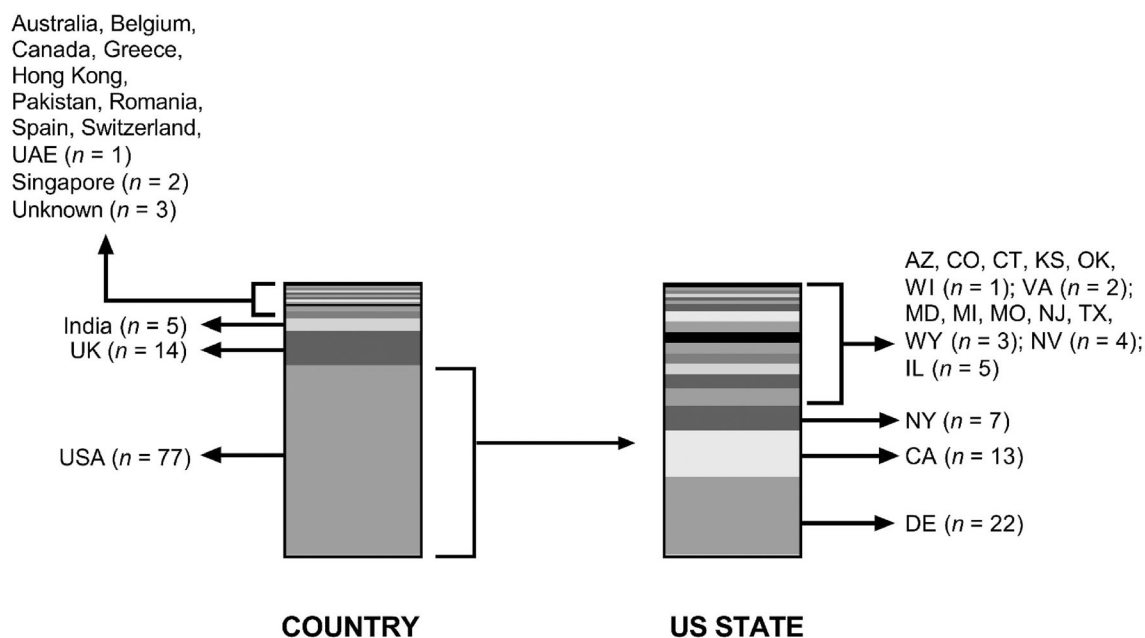


FIGURE 3 Location of predatory publishers by country and by US state. AZ, Arizona; CA, California; CO, Colorado; CT, Connecticut; DE, Delaware; IL, Illinois; KS, Kansas; MD, Maryland; MI, Michigan; MO, Missouri; NJ, New Jersey; NV, Nevada; NY, New York; OK, Oklahoma; TX, Texas; UAE, United Arab Emirates; UK, United Kingdom; USA, United States; VA, Virginia; WI, Wisconsin; WY, Wyoming.

poorly conducted (Cobey et al., 2019; Cohen et al., 2019). Therefore, there is a responsibility of the wider academic community to continually train researchers and maintain awareness of predatory journals and practices (Clark & Smith, 2015).

Various factors can account for deciding where researchers choose to publish findings (Niles et al., 2020), including pressure by institutions (Alamri et al., 2020; Cobey et al., 2019; Kurt, 2018), social identity threat, unawareness, lack of proficiency (Kurt, 2018), promises of a fast publication (Salehi et al., 2020), and impact factors and indexing in databases (Nicholas et al., 2017). These factors, combined with naivety from ECRs, authors, and even editors on the concept of predatory publishers (Alamri et al., 2020; Christopher & Young, 2015; Cohen et al., 2019; Maurer et al., 2021) and an array of tactics and features employed by predatory publishers (Memon, 2018) can result in continued submission to such predatory publishers.

To prevent the continued infiltration of predatory publications into mainstream literature (Manca et al., 2020) and potential fraudulent behaviour (Yeo-Teh & Tang, 2021), a concerted effort across multiple fronts will be needed. Previous studies have shown that education about the concept of predatory publishers and how they act has improved awareness and understanding (Ashton, 2019; Babb & Dingwall, 2019; Gerberi et al., 2021), and such education should continue. When this is combined with resources such as submission checklists (Cukier et al., 2020), updated records of predatory groups (Beall, n.d.), explicit guidance for researchers, institutions and libraries, funders, legitimate publishers, regulatory boards and patient groups (Lalu et al., 2017), as well as national and international legislation (The European Parliament and the Council of the European Union, n.d.), then the wider academic

community may be able to stem the publication of articles with predatory groups. However, the findings of the present analysis found that the latter of these points—legislation, or at least the threat of it—was ineffective and more robust approaches may be required.

Amongst the strengths of this analysis, this has taken place over the course of entire career, spanning 8 years, and allowing for inference of causality as unsolicited emails started following a conference submission, and increased following publication of contact details. Moreover, this analysis has replicated and combined previous work (Mazzarello et al., 2016; Mercier et al., 2018), and taken a progressive and step-wise approach to eliminating the unsolicited submissions. This confirmatory approach, with a substantial volume of communications (>1,200), highlights the extent to which such predatory organizations are infiltrating the publishing industry.

However, limitations do exist within this analysis. Most notably, this analysis opted to utilize criteria set forth by Beall (n.d., 2015), whereas alternative options are available. Both 'predatory lists' such as Beall's list, and 'validated lists' such as the Directory of Open Access Journals (DOAJ, n.d.) are available, as are databases such as the subscription-based lists from Cabells (Bisaccio, 2018) ('Journalytics' which provides a validated list, and 'predatory reports'). These differing types of list place emphasis on different criterion to classify a publisher as predatory, and thus a publisher may be defined as 'predatory' by one database but not another (Strinzel et al., 2019), or erroneously classified as 'predatory' altogether—particularly if they are newer. Fundamentally, the present analysis sought to replicate prior work (Mercier et al., 2018) and therefore adopted the same methodology (which

was also free to access) to ensure confidence when comparing results between studies. Moreover, it is acknowledged that this analysis did not use as an assertive approach as Mazzarello et al. (2016) who directly threatened reporting to relevant agencies (the present study only implied such action) and therefore this may constitute a weakness within the present work.

CONCLUSION

In summary, this analysis of unsolicited emails from the perspective of an ECR has highlighted notable increases in emails following landmark career events (conference registration and publication of manuscripts). It has also described the efficacy of attempts to prevent such emails, finding that the prospect of legal action may be effective, but is not completely successful. Education and awareness around the concept and practices of predatory publishers should continue, alongside action from the wider academic community to prevent their continued infiltration into the wider literature base.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Appendix S1 Supporting Information

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