THE PREDATORY PARADOX

ETHICS, POLITICS, AND PRACTICES IN CONTEMPORARY SCHOLARLY PUBLISHING

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6. What's Being Taught about Predatory Publishing?
A Systematic Review of University Resources

> It's tempting to toss off a quick, 'Don't give them your work to publish. Problem solved!' It has the advantage of brevity, but it doesn't do much to address the very real fears of scholars who don't have the training and the experience to confidently evaluate the worth of a given publication. (Schlosser 2015)

The challenge of addressing threats from predatory publishing practices is not an easy one. As the above epigraph notes, the easy but simplistic suggestion of merely avoiding such outlets is not altogether helpful when many scholars across varied disciplines lack understanding of the phenomenon, its origins, and outcomes and consequences (AlRyalat and others 2019; Christopher and Young 2015; Maurer and others 2021; Swanberg and others 2020; Webber and Wiegand 2022). Although predatory journals are a relatively new development when one considers the broader history of scholarly publishing, their importance as a threat to the ethical conduct and dissemination of research is clear: Predatory publishers have the potential to undermine overall confidence in scholarly inquiry, both in terms of peer distrust in research output tainted by distribution in a potentially predatory outlet, as well as broader public distrust in the process of science and its outcomes (Eriksson and Helgesson 2018). To address this development, various stakeholders have worked to provide educational resources or opportunities that help educate uninformed scholars about this practice (Cukier and others 2020; Lopez and Gaspard 2020; Murphy 2019).

Although predatory publishing may be relatively new, efforts to educate the research community on other aspects of research ethics

in general have a longer history. For more than thirty years, some form of research ethics education has been required by some federal funders of scholarly research (Heitman and Bulger 2006; Kalichman 2014). Efforts to satisfy these requirements may take a variety of forms, including in-person workshops, seminars, or for-credit courses, although many institutions rely on online training — and CITI training in particular — to satisfy federal requirements (DuBois and others 2010; Phillips and others 2018). Ostensibly, the macroscopic goal of such education is to ensure the responsible conduct of research, although more specific goals of training programs may be unclear, unstated, or unrealistic (Kalichman 2014; Kalichman and Plemmons 2007), which invites challenges in terms of assessing learning outcomes. Engagement in scientific misconduct may be the result of deliberate actions (e.g., falsification of data), normative perceptions, or mere ignorance — a fundamental lack of knowledge or awareness of ethical guidelines and practices about what exactly constitutes misconduct (Bouter 2015; Dubois and others 2013; Hofmann and Holm 2019; Resnik 1996; Steen 2010). With respect to the latter, training is offered (or mandated) as a vital tool to prevent misconduct in its varied forms and ensure the responsible conduct of research (Watts and others 2017).

We contend that the same is true in the area of predatory publishing. Scholars fall prey either due to a lack of knowledge on the subject or as willing participants for various reasons (see Chapter 5, this volume; Mills and Inouye 2021). As with other dimensions of the ethical conduct of research, training materials that explore predatory publishing may have the potential to play a vital role in informing scholars and providing a comprehensive knowledge base that aids decision making regarding potential outlets for their scholarly works. However, in order to identify gaps in training regarding predatory publishing, it is crucial to establish what current resources are available to others and most commonly used within scholarly research environments.

The purpose of this chapter is to provide an assessment of the publicly available training materials provided by universities on the topic of predatory publishing. This review examined resources provided by institutions with Carnegie classifications of 'very high research activity' ('Basic Classification Description' 2022) and systematically coded for a number of important variables that reflect the common elements

provided within these training resources, topics covered by these resources, and the intended audience, among other things. The findings reveal that a wealth of materials is available, and they frequently describe or list characteristics that may be indicative of a predatory journal. Moreover, they reveal a network of other resources available to help researchers evaluate the quality of a journal and avoid potentially predatory outlets. However, online resources almost exclusively imply passive participation on the part of the reader and are rarely interactive or provide any means of assessing learning. Thus, educational materials on predatory publishing may not fulfill best practices for training the scholarly community (Watts and others 2017).

Background

The broader literature on research ethics education provides a useful lens for examining materials that explore the more focused topic of predatory publishing. Although funders may require research ethics education, the precise nature of that training varies (Kalichman 2013, 2014). Thus, the precise content, method of delivery, format, or means of assessment may differ across institutions or among researchers in different disciplines within an institution. Remarkably, scholars have variably decried either the inconsistency or general uniformity in research ethics education. For example, DuBois and his collaborators (2010) reported the results of a survey of research to assess how research ethics training was achieved among investigators with National Institutes of Health (NIH)-funded Clinical and Translational Science (CTSA) awards. Their data revealed that investigators employed a variety of training resources, such as online CITI training, textbooks or textbook chapters/selections, or original materials. They concluded that 'there is no unified approach to RCR [responsible conduct of research] training' (p. 110), and plans were inconsistent across or even within single institutions. For example, they noted that some survey respondents indicated that their university offered no RCR training, while colleagues at the very same institution correctly noted that such training was indeed offered.

On the other hand, some scholars have noted greater consistency within RCR training, at least with respect to topics of research ethics education and how universities satisfy federal training requirements.

The Office of Research Integrity within the Department of Health and Human Services identified nine core areas that should be included in RCR training (Steneck 2007). Kalichman (2013) noted that the specific topics addressed in RCR training have been fairly consistent through the various evolutions of federal guidance on education: 'While the wording has varied slightly, 5 topics (conflict of interest, data management, authorship and publication, research misconduct, and human and animal subjects) have been retained in all 4 versions of these requirements' (p. 385). In general, the materials and resources developed to meet these requirements directly reflect these topics.

Funder mandates stipulating some form of RCR training have spurred the rapid growth of materials and resources offered to satisfy these requirements (Kalichman 2013), and the systematic review or examination of courses, curricula, or other materials used in research ethics education represents a robust, ongoing body of scholarship (e.g., Phillips and others 2018; Pizzolato and others 2020) that can inform the broad assessment of resources developed to train scholars on the topic of predatory publishing. Furthermore, the curation of training materials has been the explicit focus of government-sponsored research as well as a goal of those types of reviews (Kalichman 2014). Thus, efforts to catalog training resources are not without precedent.

For example, Phillips and others (2018) examined publicly available training materials offered to satisfy RCR training requirements mandated by US federal funders. Specifically, their analysis focused on the nature and delivery format of these materials to determine if they reflected recommended best practices for research ethics training. As Phillips and others (2018) noted, these best practices were the result of a National Science Foundation (NSF)-funded workshop held by the National Academy of Engineering that was later summarized as an edited book (Hollander and Arenberg 2009):

> (1) noninstructor-led, online-only programs do not provide adequate instruction; (2) multiple formats of instruction are needed; (3) programs should be wide-ranging and cross-institutional, with content that varies by disciplinary areas and career stage; (4) ethics education cannot be administered in a single "dose"; and (5) principle investigators (PIs) should be positively involved in teaching RCR to their trainees. (Phillips and others 2018: 229)

To conduct their review, Phillips and colleagues examined publicly available training plans and materials from a sample of 108 US universities labeled as 'very high research activity' under the Carnegie classification system. Their review focused on a variety of attributes of the materials, including format (i.e., online versus in-person training), duration or frequency of training, and customization of the materials for researchers at different stages of their careers (i.e., undergraduate, graduate, or postdoctoral researchers). Among their varied findings, they reported that most university plans to satisfy NSF-mandated ethics training 'could be satisfied with online-only training' (Phillips and others 2018: 232). Of these, a large majority listed CITI training as the sole online resource for fulfilling this requirement. However, their findings also reflected an illuminating discrepancy between what was required versus what was offered. As they note, 'more than half the plans we reviewed *offered* more meaningful educational opportunities, but did not *require* that trainees engage in them' (p. 245). For example, in addition to the required online training, universities offered other optional opportunities for ethics training including seminars, brown-bag discussions, orientation sessions, or even for-credit coursework.

Moreover, their review also noted a lack of meaningful assessment or differentiation across the training materials reviewed. Indeed, Phillips and others (2018) noted that for a small handful of programs, undergraduate students could meet or fulfill research ethics training requirements by merely receiving a handout with no assessment of comprehension or retention. Furthermore, a majority of training programs had uniform requirements for undergraduate, graduate, or postdoctoral researchers.

In sum, Phillips and others (2018) concluded that most university-mandated trainings to fulfill NSF or NIH requirements do not live up to recommended best practices in terms of modality/format; variation of topic/content by discipline with a focus on the unique needs of a given field; variety as a function of the stage of one's research career; or PI-centered focus.

Although similar to the review by Phillips and others (2018), Pizzolato and colleagues (2020) conducted a systematic review that focused more squarely on the substantive content addressed in training

materials. In their review, they examined 237 online resources on the topic of research integrity (RI) in order to capture twenty-one attributes or aspects of these resources, including topics examined, whether the content was tailored to specific disciplines or audiences, country of origin, or teaching approach (e.g., passive vs. active).

Among other things, they found that resources generally did not reflect disciplinary customization, and only implied passive participation of the learner (i.e., information was merely provided for review). Of particular interest to our discussion of predatory journals and publication ethics, they found that publication-related issues were among the top three most discussed topics, appearing on more than half (55%) of the resources examined. However, within the discussion of publication ethics, common topics were authorship or plagiarism, and no evidence was provided that predatory publishing was discussed within any of the resources they examined.[1] On the one hand, the fact that scholarly publishing is frequently included as an important ethical dimension of scientific research and associated training illustrates the importance of the effective (and ethical) dissemination of knowledge as part of the conduct of science (Heitman and Bulger 2006). However, the rise of predatory publishing models represents a new threat that could be included as a component of research ethics training.

With respect to the curation of resources, several of these studies have made their collections of training materials gathered in the conduct of their review publicly available. These resources could aid institutions in developing or implementing research ethics training, as well as individual researchers wishing to implement training within their own research groups, classrooms, or other venues by providing easy access to a single repository of materials. For example, as part of their systematic review of research ethics training materials, Pizzolato and others (2020) made these resources available online through their 'Embassy of Good Science' website. Furthermore, they created a grid that summarized these resources as a supplement file to their published manuscript.

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1   Review of the supplementary document that accompanied their manuscript revealed no discussion of predatory publishing, although open access publishing was noted for two resources.

Guiding Questions

The present analysis was patterned after these models and sought both to examine the nature of the resources provided by universities and to curate extant educational materials or other resources on the topic of predatory publishing through a list of available resources. Specifically, the analysis sought to answer a number of questions. Given that training materials or other information on predatory publishing could take a variety of forms, what are the most common types of online resources available from universities? Moreover, do they reflect a stated audience, either as reflected by the content itself, or as a function of some explicit statement?

Cursory review of the myriad sources created to educate or inform the academic community about predatory publishing reveals a web of interconnected or commonly linked resources or materials. This begs the question, what resources are most commonly linked within materials that discuss predatory publishing? Among these resources, what topics are most commonly addressed within online resources that discuss predatory publishing? Lastly, the dynamic nature of online content affords tremendous flexibility in terms of the structural nature of these materials (e.g., text, videos, interactive features). As such, we ask, what are the formal characteristics of online resources in terms of content format or modality?

Method

Sample and Unitizing

Publicly available online resources from universities that provided information or training in the area of predatory publishing were examined. To collect this sample, a Google web search for universities in the United States categorized with a basic Carnegie classification of 'very high research activity' ($N = 131$) was conducted in July 2021 ('146 Results for Basic' 2022). To ensure that as many resources were captured as possible, separate searches were conducted using the university name and four search terms — predatory publishing, predatory publish,

predatory journal, and library AND predator — to locate other publicly available resources, such as training or materials provided by discrete academic units or libraries.

Materials included in the sample were restricted to resources hosted or provided by the universities; thus, only resources under university URLs or domains were included. We attempted to capture all digital resources hosted by these universities that could be used as training or supplemental materials, including archived recordings of talks and lectures or slide decks of presentations. However, individual faculty scholarly publications on the topic, regardless of where they were hosted online (i.e., on a publisher's website or university's website) were not included as they did not constitute materials designed as training or educational materials. Similarly, pages simply announcing upcoming (or past) talks or lectures were not included for review, as these pages typically did not contain substantive information or training material that could be used as a durable resource. In addition, we did not include social media posts (e.g., Twitter posts) from university faculty on the topic as they did not represent training materials provided by the university.

One challenge in gathering materials for review was unitizing the resources identified through the search. For example, the search process described above often yielded multiple distinct URLs that included language on the topic of predatory publishing. However, upon closer inspection, these unique URLs may have been part of a single resource, such as a comprehensive library guide on scholarly publishing with multiple components or pages therein that referenced predatory publishing. As an analogy, these distinct URLs within a single resource could be compared to individual chapters within a single book. Counting the distinct URLs could have the effect of artificially inflating the amount or number of training materials provided. In order to provide a more conservative review of training materials that avoids this potential inflation, analysis of the materials was performed at the broader 'resource' level, rather than repeating the analysis on each individual page or part of a broader resource. This is analogous to Pizzolato and others (2020) who found that some educational tools were part of a single broader resource. For example, a guide on scholarly

publishing from the University of Virginia library contained references to predatory publishing on two distinct pages within the guide. But for the purpose of analysis here, the guide was treated as a single unit.

Evaluation Criteria

Review of the characteristics of the materials examined twenty attributes and was patterned after suggested best practices in research ethics education or past research examining RCR training materials (Hollander and Arenberg 2009; Kalichman 2014; Phillips and others 2018; Pizzolato and others 2020). These attributes include both structural or formal features of the resources examined (e.g., the presence of video content; links to other resources or tools), as well as the substantive content of these resources in terms of the information provided (e.g., tailored or customized focus; definitions, descriptions, or common characteristics of potentially predatory publishers; discussion of the history of predatory publishing). Other attributes captured information about the creator of the content (e.g., an author was identified and contact information provided) and its currency (e.g., date of last update). These characteristics are summarized in Table 6.1 as an online supplement (Appendix A), along with a full copy of the coding scheme employed here.[2]

Coding

Resources identified through the aforementioned web search were examined between fall 2021 and spring 2022, and independently coded for the presence or absence of these structural and content characteristics by the first author of this chapter and a trained graduate student. Prior to formal coding, multiple rounds of training were conducted where coders reviewed the analysis scheme on a separate pilot sample of resources from programs identified as 'high research activity' by the Carnegie classification system. During this training,

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2   Table 6.1 can be accessed at https://doi.org/10.11647/OBP.0364#resources. The full coding scheme ("STEPP Coding Scheme") and resultant data ("STEPP Systematic Review Dataset") are available in the Chapter 6 dataset: https://doi.org/10.18738/T8/D6RICU.

these pilot materials were coded, pilot reliability was reviewed, and the analysis scheme was revised in order to achieve satisfactory intercoder reliability on the study sample (Neuendorf 2017).

For the study sample, a commonly coded subsample of resources from 10% of the universities within the population was randomly selected to be examined by both coders and used for formal intercoder reliability assessment. For this study, simple percent agreement was employed due to the high incidence of select coding options within the sample and rare incidence of others (Zhao and others 2013). Intercoder agreement was >85% for all variables, and disagreements were reviewed by the first author of this chapter for final coding decisions.

Results

A total of 204 online resources comprised the study sample. Although most universities within the population provided some form of online information or resource on the topic of predatory publishing resource (e.g., library guide, informational newsletter article), for 17.5% ($n = 23$) of universities designated as very high research activity within the Carnegie classification system, the web search yielded no materials on the subject of predatory publishing. In addition, some online resources identified through the initial web search were no longer active once coders began examining them a short time later. This obviously speaks to the somewhat volatile nature of web content and challenges of examining online materials (McMillan 2000).

Resource Type and Source

One of the first questions we sought to explore through the analysis was the general nature of the training materials within the sample. As shown in Figure 6.1, among the resources gathered, the vast majority were library guides designed to provide a comprehensive understanding of the nature of predatory publications.
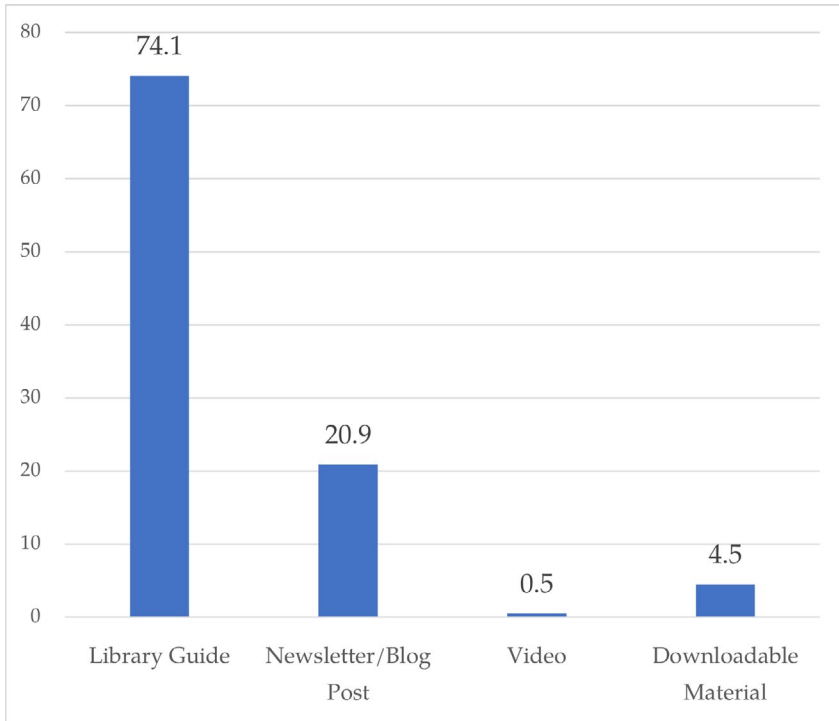
Fig. 6.1 R. Glenn Cummins. *Nature of Online Resources Regarding Predatory Publishing* (2022). © STEPP Research Team

Other newsletter articles, blog posts, or similar short discussions of predatory publishing varied in the depth and nature of the information presented. Some materials provided useful information that was designed to inform readers about the general nature of predatory publishing, review common characteristics of potentially predatory journals, and/or provide links to other useful resources. For example, the University of Illinois Chicago Graduate School provided a somewhat in-depth informational article on the topic ('Don't Fall Prey' 2020). However, other stories or posts merely mentioned predatory publishers in the context of other topics (e.g., managing email; Naegle 2016), or merely as personal opinion or discussion of events related to predatory publishing.

In addition, the web search discovered a small number of direct links to downloadable files, most typically Microsoft PowerPoint files or Adobe Acrobat/PDF versions of slide decks from a presentation on the topic. For example, an archived presentation on 'Author's Rights & Predatory Publishers' (Royster 2015) from a library staff member at the University of Nebraska-Lincoln provided a review of the nature of predatory publishers, a discussion of safe/watch lists, and potential warning signs.

Because library guides represented the most common type of online resource as well as the type of material most clearly designed to educate and inform regarding predatory publishing, the remaining analysis focused only on those guides ($n = 149$). Coders examined a number of descriptive characteristics of these resources, including whether they provided a contact person and an explicit date when the resource was last updated. With respect to contact person, the resources were evenly split, with a very slight majority not providing a specific person/point of contact should the reader request additional information or assistance ($n = 76; 51\%$). However, most of the resources did denote when they were last updated ($n = 121; 81.2\%$). Of those, almost all were relatively current, with only one resource providing an update date prior to 2020.[3]

Target Audience

Given the suggestion that educational resources or materials be developed for specific audiences, we examined whether materials in the sample reflected this suggestion. Two attributes of the resources were examined to determine the intended audience of the information. In terms of the tailored nature of the content, language or specific content within most of the resources was not focused on a specific discipline ($n = 126; 84.6\%$), while one-quarter did reflect some specialization, either through language within the page or specific resources linked within the materials. For example, a library guide published by the Texas Tech University Health Sciences Center included the explicit statement that 'This guide deals with predatory publishing in the health sciences'

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3   Notably, that one resource has since been updated.

(Stuart 2021: para. 1). Other materials within the sample included links to resources with a disciplinary focus (e.g., MEDLINE, CINAHL Complete) with language that referenced the associated discipline or research area.

The specified audience was often not defined or presumed to be general ($n = 106$; 71.1%). When the intended audience was specified ($n = 43$; 28.9%), this was typically through language within the resource. For example, Cornell University library provides a resource titled 'MAE [Mechanical and Aerospace Engineering] Orientation for Graduate Students: Predatory Journals' ('Understanding and Avoiding' 2020). Likewise, the Ohio State University library provides a similar resource labeled 'General Resources for Graduate Students in the Physical Sciences and Engineering' ('General Resources' 2022).

Linked Resources

One distinguishing property of online content is the potential for interconnected content through shared hyperlinks. Thus, the analysis sought to examine the network of resources that characterize online materials on the topic of predatory publishing. Notably, all library guides examined in the sample provided at least some links to other resources external to the university, although there was considerable variability in the specific resources linked to within the guides. As seen in Figure 6.2, the Directory of Open Access Journals (DOAJ) was the most frequently linked external resource. Think. Check. Submit. was the second most frequently linked resource but was only found in roughly half of the guides. Likewise, as Figure 6.2 illustrates, almost half the guides also linked to scholarly articles or informational or blog posts on the topic of predatory publishing.
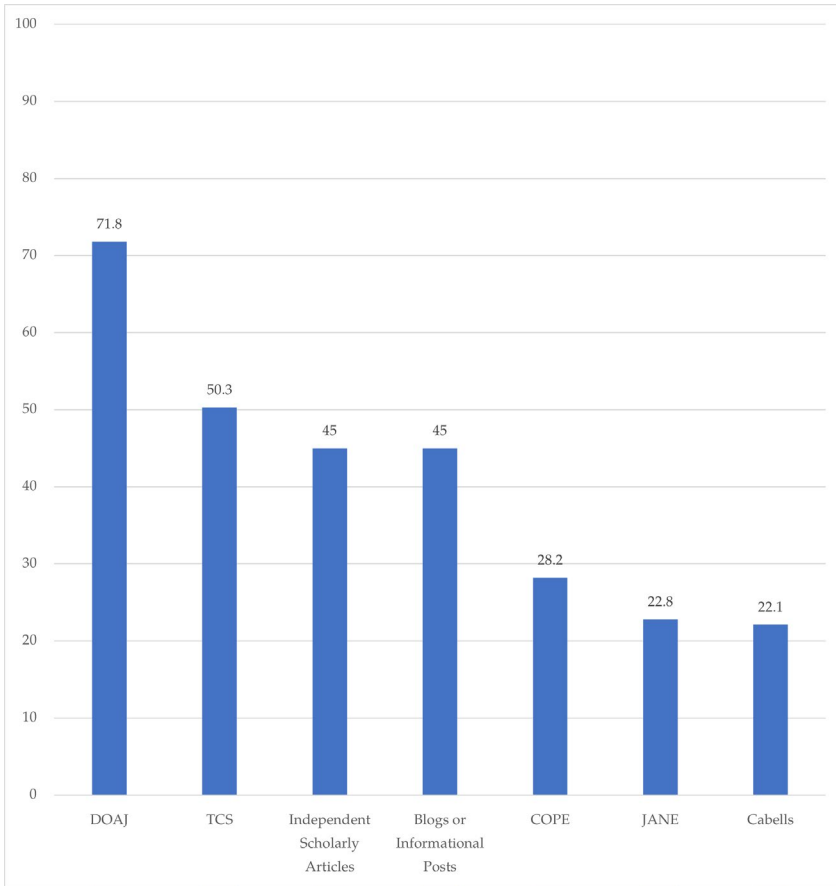
Fig. 6.2 R. Glenn Cummins. *Percentage of Library Guides that Provided Links to Common External Resources on Predatory or Open Access Publishing* (2022). © STEPP Research Team

Notably, although all library guides provided some links to external resources, a slight majority of those ($n = 81$; 54.4%) included at least some links that were password protected or behind some form of paywall that required a university subscription or credentials. Thus, although further information was provided, access was not freely available to all interested individuals.

Content Areas and Structural Attributes

Perhaps the most important elements examined within the systematic review of training resources was the actual substantive content of these materials, including discussion of the history of predatory publishing, characteristics of potentially predatory publishers, case studies describing individual experiences with predatory publishing, and more.

Notably, more than half of the resources provided did not offer a formal, explicit definition of predatory publishers ($n = 83; 55.7\%$). Often, resources would use the term 'predatory publisher' and then provide guidelines for selecting publishing outlets without explaining what the term means. For example, Stony Brook University library offers a guide that references solicitations to publish as well as pressure to produce published findings. It states, 'Some of these offers are legitimate but others turn out to be scams perpetrated by predatory publishers' ('How Do You Know' 2022: para. 1). But no further definition is offered to help guide the potentially uninformed reader. Likewise, one guide from the University of Houston library on 'Author Rights and Publishing Resources' briefly references 'so-called predatory publishers' in a section on publishing in open access journals before linking to DOAJ ('Take Control' [n.d.]). Again, no definition of the phenomenon is offered within that specific guide.[4]

Other resources provided more explicit definitions of predatory publishing. For example, the Health Sciences Library at the University of Utah provides a guide on 'Scholarly Publishing and Copyright' that defines the phenomenon: 'A predatory publisher is an opportunistic publishing venue that exploits the academic need to publish but offers little reward for those using their services' ('Predatory Journals' 2023: para. 1). Similarly, the University of Florida library provides a guide exclusively focused on predatory publishing that states, 'Predatory publishing typically refers to cases where individual journals or organizations intentionally deceive authors or readers by falsely claiming to offer publishing services or expertise' ('Predatory & Questionable Publishing' 2021: para. 1).

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4   It should be noted that other, separate guides from the university do offer an explicit definition.

Other guides draw upon consensus or published definitions of the term. For example, the Lane Medical Library at Stanford University provides a broad guide on 'Research Impact' that contains a subsection on predatory journals nested under a discussion of journal ranking ('Research Impact' 2023). It provides the consensus definition drafted by forty-three scholars who met in Ottawa, Canada, and was later published in the journal *Nature*: 'Predatory journals and publishers are entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices' (Grudniewicz and others 2019: 211).

A relatively common element within the guides examined within the sample is some discussion of how to identify potentially predatory outlets. A majority of guides reviewed here ($n = 91$; 61.1%) provide either some discussion or an explicit checklist of these attributes. For example, a library guide from Virginia Commonwealth University titled 'Avoid Publishing Scams' provides a bulleted list of 'common qualities' of predatory publishers (Miller 2021). Other resources describe these characteristics in a more narrative form, such as the guide 'Navigating the Article Publication Process' from the Ohio State University libraries: 'Predatory publishers often aggressively solicit manuscripts from scholars, charge fees with no transparency about their purpose, and/or have little or no quality control (peer review, editing, etc.) over their content' ('Navigating the Article' 2021: para. 2).

Library guides were much more likely to point to lists or directories providing information on so-called 'safelists' compared to 'watchlists'.[5] A majority of the resources examined provided links to other resources that contained information on journals that had been reviewed by some organization to ensure quality. The most common provider linked to was DOAJ. Indeed, of the 114 resources that provided links to 'safe lists', a large majority ($n = 91$; 79.8%) included a link to DOAJ, making it by

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5   Until recently, many examining the topic of predatory publishing and lists of potentially problematic outlets employed the dichotomy of 'blacklists' and 'whitelists'. As noted in Koerber and others (2020), we follow the lead of Cabells International and adopt the phrase 'safelist' and 'watchlist' to avoid the 'symbolism inextricably tied to the idea of blacklists and whitelists' (Bisaccio, 2020, para. 1)

far the most common such resource. Links to UlrichsWeb Global Serials Directory were less common ($n = 39$; 24.2%), as were links to Cabells Journalytics ($n = 15.8\%$).

Although not referenced as a comprehensive list of safe publishing outlets, some resources also suggested checking to see if the journal publisher was a member of the Open Access Scholarly Publishers Association (OASPA). For example, the Himmelfarb Health Sciences Library at George Washington University provided a library guide on predatory publishing that contained a section on 'Qualities of Reputable Journals' ('Researcher Services and Support' 2022). It suggested checking to ensure that the journal was indexed in UlrichsWeb and DOAJ, as well as checking to see if the publisher was a member of the OASPA (see Figure 6.3).
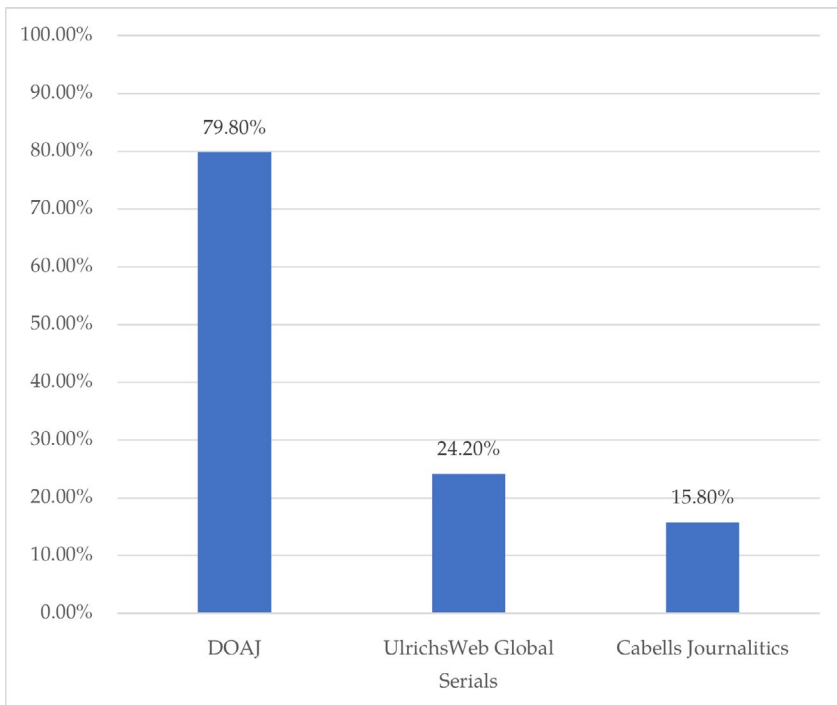

Fig. 6.3 R. Glenn Cummins. *Percentage of Library Guides that Link to Providers of 'Safe Lists' or Databases of Scholarly Journals Reviewed for Quality* (2022). © STEPP Research Team

Regarding watchlists of potentially predatory journals, these were relatively rare within any of the resources within the sample (*n* = 49; 32.2%). Of those that did provide links to lists of predatory journals, all linked to some archived (or dead) version of Beall's list of potentially predatory journals (Beall 2016).[6] However, some resources explicitly advise readers to not rely upon such lists. For example, the library at Northeastern University acknowledges Beall's list but instead encourages readers to rely on other tools to avoid potentially predatory journals ('Choosing a Publication Venue' 2022).

Multiple additional content attributes were also examined within the sample of resources (see Figure 6.4). The history of predatory publishing was all but ignored within the sample, appearing in only one material (0.7%). That resource, provided by the library at Georgetown University, gave a brief summary of the increase in open access publishing and noted, 'Due to the ease and low cost of publishing online, many of the new journals were from unknown publishers, some of which were labeled 'fake' or 'predatory' as they did not deliver the quality and service expected, while collecting substantial fees from authors' ('Journal Quality' [n.d]: para. 1). The resource then describes various attempts to address concerns surrounding this phenomenon, including links to various commentaries and other resources on the topic.

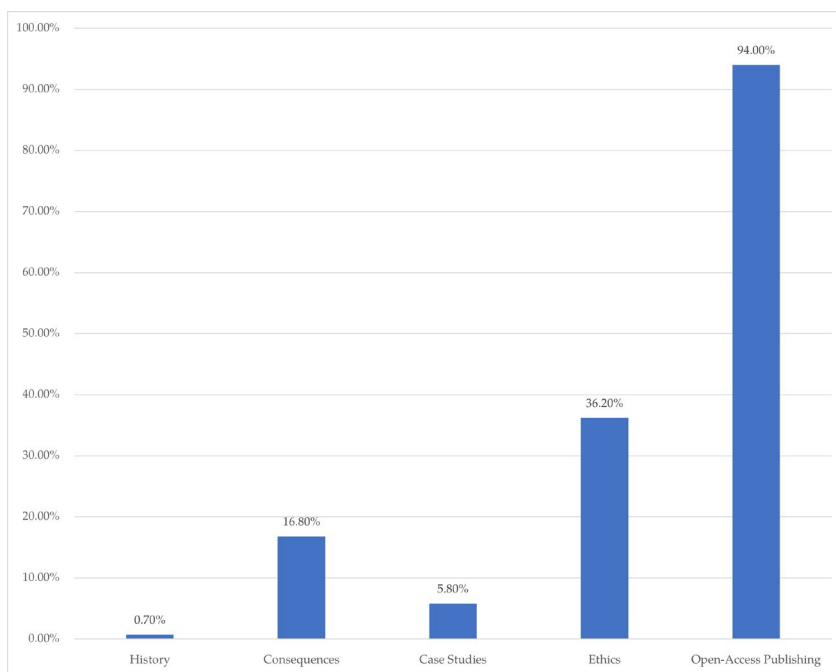6   E.g., http://web.archive.org/web/20170111172306/https:/scholarlyoa. com/publishers/

Fig. 6.4 R. Glenn Cummins. *Percentage of Library Guides that Include Discussions of Various Content Areas and Topics* (2022). © STEPP Research Team

A fairly small minority of resources (*n* = 25; 16.8%) provided discussion of the possible consequences associated with publishing in a potentially predatory publication. For example, the Brown University library provides a guide titled, 'Understanding Unethical Publishing Practices' that contains a section under the heading 'What's the harm?' The guide then describes various negative consequences of publishing in potentially predatory outlets such as sub-par peer review, the transitory qualities of some potentially predatory outlets, as well as possible stigmas associated with predatory outlets ('Understanding Unethical Publishing' 2020). But such discussions are rare, as a majority of materials do not discuss these consequences.

Likewise, discussion of specific case studies is uncommon and was found in only 5.8% (*n* = 8) of the sample. For example, as shown in Figure 6.5, the University of Pittsburg library's guide on 'Illegitimate and Predatory Publishing' provides a section under the 'Case Study' menu that provides an annotated example of an email solicitation indicative

of a potentially predatory journal ('Case Study' 2021). In addition, it provides an image of a specific journal with annotations denoting potential concerns with the outlet. Similarly, the medical library at the College of Medicine at Florida International University provides a library guide on 'Where to Publish' ('Where to Publish' 2022). That guide also contains an annotated image of an email solicitation that notes potential concerns, such as lack of contact information for the journal and a false sense of urgency regarding the publishing opportunity. But again, these specific illustrations or examples were absent in the vast majority of training resources.

Fig. 6.5 R. Glenn Cummins. *Case Study from the University of Pittsburgh Library with Annotated Image of Potentially Predatory Solicitation Email* (2021). © University of Pittsburgh Library

With respect to the discussion of ethical aspects of potentially predatory publishing, a majority included no discussion or even reference to ethics ($n = 95$; 63.8%), and just over one-third of resources ($n = 54$;

36.2%) provided only a brief mention or simple link to the Committee on Publication Ethics (COPE). None provided a substantive discussion of the ethical dimensions of predatory publishing.

Lastly, the discussion of predatory publishing was almost universally placed within the context of or associated with some broader discussion of open access publishing ($n = 140; 94.0\%$). For example, the University of Tennessee library provides a comprehensive guide titled 'Scholarly Publishing Toolkit'. Within this guide, one section focuses on open access publishing and also discusses predatory publishing, Beall's list, and other journal selection criteria ('Scholarly Publishing Toolkit' 2022).

Similarly, other resources place discussions of predatory publishing underneath the more macroscopic umbrella of open access publishing. As a case in point, the library at the University of California San Diego provides a guide explicitly focusing on open access publishing. Within the FAQ of that guide, predatory publishing is briefly defined and discussed, but primarily as a means of differentiating potentially predatory publishers from more transparent and reputable open access publishers ('What is Open Access?' 2022). Regardless, this reflects the potential confusion in differentiating open access from predatory publishing and long-standing relationships between the two (see Chapter 2).

Structural Features of Resources

Lastly, this systematic review sought to examine not only the content of the materials within the sample but the structural nature of that information, including the use of video, assessments, or other media or modalities. A small minority of resources employed only textual information ($n = 26; 17.4\%$), whereas most resources within the sample employed various other forms of information including videos, graphics, or other elements.

Although not used in a majority of resources, videos were included in more than one-third of materials within the sample ($n = 59; 39.6\%$). The source or creator of the videos varied considerably. Of those videos, most were from external sources ($n = 47; 79.7\%$) and only 20.3% were created by someone within the university ($n = 12$). The most commonly linked or embedded videos were an overview from Think. Check.

Submit. ($n = 19$), and 'Open Access Explained!' from PhD Comics ($n = 12$), although a wide assortment of other videos were also found (e.g., an interview with Jeffrey Beall; a video on predatory publishing from a class titled 'Calling Bullshit' at the University of Washington; a video explaining the vanity press; an internally produced video explaining scholarly versus popular press sources).

In addition, many resources included downloadable Adobe Acrobat PDF documents ($n = 69$; 46.3%) as well as a scattered assortment of other types of files or modalities, including Microsoft PowerPoint files or information graphics. Notably, only three (2.0%) of the resources included within the sample were interactive beyond mere site navigation. Those two sources were library guides from Northwestern University and the University of Alabama at Birmingham, and both featured prompts or tasks that asked readers to review information from external sources (i.e., DOAJ; UlrichsWeb; Think. Check. Submit.) to answer specific questions.

For example, the resource from the University of Alabama at Birmingham contained a section labeled 'Evaluating Journals Practice' with links to four practice trials ('Predatory Publishing: Author Resources' 2022). Each link then asked users to find a specific journal or publisher within one of those external resources and answer questions about the source (e.g., 'Is the journal indexed in the Directory of Open Access Journals?'; 'Is the [journal] homepage free from language that targets authors? (ex. Prominently displays submission links and information, promotes quick peer review').

Lastly, learning assessments were also rare and were only found in two (1.3%) of the resources examined. One assessment was a question asking 'Was this information helpful?' with a simple yes/no response, and one was a forced-choice quiz in a resource from the Yale University medical library that asked a series of questions about the nature of open access publications ('Scholarly Communication' 2022).

Discussion

Inspired by previous assessments of learning materials and other resources regarding the responsible conduct of research (e.g., Phillips and others 2018; Pizzolato and others 2020), the present chapter

systematically examined publicly available materials on the topic of predatory publishing from US universities receiving the highest research classification under the Carnegie system. Perhaps the most important finding from this review is that resources developed to educate the research community regarding predatory publishing are available. Almost all the universities included within the study sample provide at least *some* form of resource or training material on the topic of predatory publishing, with many universities providing multiple resources. Secondly, the majority of these materials were in the form of often quite comprehensive library guides on the subject. This reflects their role in leading efforts to inform the scholarly community about this phenomenon (Ciro 2021; Lopez and Gaspard 2020; Ojala and others 2020; Teixeira da Silva 2022). Thus, the challenge is determining how to encourage scholars — both emerging and senior — to engage with these materials in a meaningful way. As the opening epigraph from one resource provided by the Ohio State University notes, simply telling scholars not to publish in predatory journals does little to inform the academic community about why this problem exists or how to identify a potentially predatory journal — vital information if the threat of predatory journals is to be addressed.

Key Findings

Topics, Content, and Structure

In terms of topics, this analysis reveals a fair amount of consistency in terms of what is, and perhaps more importantly, what is not discussed. A majority of the resources examined here included some narrative description or bulleted list of common characteristics of potentially predatory publications (61%). Indeed, such approaches are a standard way to help authors identify potentially problematic scholarly outlets (Cukier and others 2020). Likewise, the present review also illuminated some consistency in terms of commonly linked resources that could be used to educate scholars. DOAJ was frequently linked as a tool authors could rely upon to evaluate the quality of open access journals. Moreover, many of the materials reviewed here also link to the tools and training provided by Think. Check. Submit. or even directly embed

videos from that source designed to educate audiences on identifying quality publishing outlets.

The resources reviewed were also fairly consistent in what was not discussed. Broad discussion or even case-based review of the consequences of publishing in predatory outlets, the history of the phenomenon (see Introduction), and ethical aspects of predatory publishing (see Chapter 1) was less common and varied among the resources examined. Although these may be less pragmatic than simple checklists, discussions such as those in the present volume fill a demonstrated gap in terms of education surrounding predatory publishing, and the chapters and exercises provided herein can advance broader understanding of the potential threat posed by predatory publishing.

If one of the recommendations for research ethics training is to employ a variety of forms or modalities (Hollander and Arenberg 2009), the resources examined here on predatory publishing do achieve this to some extent. Few of the materials examined relied solely on text, and many embedded or linked to helpful videos. Again, the most common was a video from Think. Check. Submit. on the topic of evaluating publication outlets. Furthermore, many of the resources also provided additional documents that could be downloaded or reviewed.

Customization of Materials

Reviews of university resources available or efforts to satisfy these requirements have noted that such efforts are somewhat undifferentiated by both topic and audience and may not fulfill suggested best practices for providing such training (e.g., DuBois and others 2010; Pizzolato and others 2020). Such was somewhat the case here. This review of resources on the subject of predatory publishing found that a large majority of materials did not reflect any disciplinary focus (84.6%), and most materials (71.1%) did not state a specified audience (e.g., graduate students, junior faculty, etc.).

A common refrain among scholars focusing on research ethics is a stronger need to directly engage project principal investigators (PIs) in the effort to train emerging scholars regarding research ethics. For

example, Phillips and others (2018) argue that challenges to ethics training may be more a function of PI awareness or engagement rather than a lack of university effort in creating training materials or opportunities. Mentorship has long served as a predominant model by which the practice of scientific research has been passed down, not unlike other trades or crafts (Kalichman 2013). One argument for the need for stronger efforts to engage PIs and provide education regarding predatory publishing is the (potentially false) assumption that knowledge on the topic is passed down through mentorship from senior to junior or emerging scholars (see Chapter 5).

Although research ethics education may be formally satisfied through courses or other activities, generating greater understanding and awareness may also take place through less formal means. For example, some scholars have noted the 'hidden curriculum', or 'the teaching that happens outside of the formal curriculum taking place in classrooms and lecture halls' that characterizes part of the mentorship experience (Fryer-Edwards 2002: 58). Here again, this emphasizes the importance of PI-driven efforts to combat against the potential pitfalls associated with predatory publishing. Although this hidden curriculum is certainly a function of peer-to-peer learning, mentors also play a strong role in this informal training in addition to more formal efforts, as is discussed in detail in Chapter 5 of this volume.

Together, this lack of disciplinary specialization along with the recognized potential for leveraging the hidden curriculum underscores the need for materials that have greater disciplinary focus. For example, training materials aimed at more senior faculty may emphasize specific methods of instruction for teaching regarding predatory publishing in formal classroom or informal lab settings, whereas materials aimed at student researchers or junior scholars may emphasize actual content (e.g., how to detect predatory journal solicitations). Likewise, although more generalized training may have some value (Watts and others 2017), development of discipline-focused resources can help inform and educate scholars in a way that has greater relevance (Gunsalus and Robinson 2018; Kalichman 2014).

Assessments

One noteworthy finding was a general lack of any form of assessment within the sample of materials examined. As previously noted, only two guides included any form of learning assessment, and materials most typically presented information without any attempt to determine their effectiveness. As with past reviews of research ethics training materials (Phillips and others 2018; Pizzolato and others 2020), there was very little evidence of active participation by the intended audience of the material. Despite being presented in a web-based format that could technologically afford dynamic, interactive content, information was provided with little to no input or engagement with the reader and implied only passive participation.

In their review of educational techniques employed in research ethics courses, Todd and others (2017) emphasized participation, student involvement, and case-based learning to facilitate more active learning styles and discouraged more passive educational approaches such as lectures. Likewise, Watts and others' (2017) meta-analysis of research ethics courses notes that 'courses appear to benefit most when training emphasizes individual-based, as opposed to group-based, activities that encourage at least a moderate degree of active participation' (p. 380). Thus, in many ways, the resources created to inform scholars about predatory publishing are much like many resources previously created to fulfill education on research ethics — they rely on educational approaches that are not necessarily the most effective.

Conclusion

In his review of the history of training in the area of the responsible conduct of research, Kalichman (2013) concluded with this pithy question and answer: 'With so many tools at our fingertips, it is fair to ask are they sufficient? Are they working? The answer is an unequivocal "We don't know."' (p. 389). Among the reasons offered for this uncertainty were that educational goals were diverse, requirements weren't taken seriously or were unclear, and 'nominal evidence of effectiveness' (p. 390). Although offered specifically regarding the responsible conduct

of research, some of these could just as easily be applied to the topic of predatory journals.

Clearly, this systematic review illustrates the considerable energy devoted to creating materials designed to educate faculty and student researchers alike regarding the nature of predatory journals. However, these resources could be improved by integrating assessments that actually demonstrate learning. Moreover, these assessments should closely align with explicitly stated educational goals and provide sufficient nuance to distinguish precisely how well mentees understand varied aspects or dimensions of predatory publishing, its impacts, and potential perils. Such meaningful assessment then allows mentors, librarians, or other stakeholders to address specific areas where knowledge may be deficient (Keefer and others 2014).

Phillips and others (2018) noted that university web pages designed to provide links to training that fulfills NSF mandates may only list the specific tool used to fulfill or meet the requirement, and not include the broader array of additional opportunities for research ethics training and education above and beyond what was required. Likewise, the web search conducted to generate the study sample also yielded numerous public notices of workshops on the topic. As just a few examples, the University of California at Irvine hosted a workshop 'geared toward early-career researchers' on the topic of 'Predatory Publishing and Diversity in Open Access Publication'. The workshop synopsis noted the potential for power imbalances between non-Western researchers or institutions and US-based scholars (see Chapter 3, this volume). Likewise, the University of Illinois hosted a workshop, 'Evaluating Journals: The Good, The Bad, and the Predatory' that aimed to help attendees recognize characteristics of predatory publishers and aid decision making about publication outlets. Although these were not included in the analysis here (as they were merely persistent records or notices of past events and did not contain substantive information), they do provide evidence of university efforts to elevate the level of discussion around predatory publishing and help create a culture where the topic is addressed.

These workshops, when combined with the wealth of resources discovered and reviewed here, demonstrate that ample resources

developed to inform others about the nature of predatory publishing exist. Although they certainly have value, mere safelists and watchlists (Koerber and others 2020; see Introduction), or static, noninteractive library guides like those reviewed here only reflect the beginning of what could be done to address the threat of predatory publishing. The next step is developing more interactive, tailored tools and encouraging thoughtful adoption and customization of these materials in courses and research lab environments to ensure widespread understanding of the ethical threat that predatory publishing models represents.

Key Takeaways

- Predatory publishers have the potential to undermine overall confidence in scholarly inquiry.

- To address the issue of ethical research practices, a variety of educational resources were developed to help scholars understand ethical practices, partially spurred by national or institutional funding requirements.

- This chapter assesses publicly available training materials related to predatory publishing that is provided by US universities who are ranked by the Carnegie classifications as having very high research activity.

- Two recent studies (Phillips and others 2018; Pizzolato and others 2020) found that most training materials currently available merely provided information, but did not have mechanisms to assess learning and retention of the materials.

- University libraries were the primary source of training and informational material related to predatory publishing, but the depth of information provided varied greatly.

- Most resources were not discipline specific, and instead targeted a broad academic audience.

- A majority of the resources linked to either DOAJ or Think. Check. Submit. as external sources for readers to get more information.

- More than half of the resources did not offer a formal, explicit definition of predatory publishers.

- Most resources offered suggestions on how to identify predatory outlets.

- The history of predatory publishing and the consequences for authors who submit their work to such publications was only discussed by a small minority of resources.

- Predatory publishing was almost always linked in some way to discussions about open access publishing.

Discussion Questions

1. Why might resources that invite passive participation not be the most effective means of educating scholars on predatory publishing?

2. What might some reasons be for the divide between researchers' perceptions of available training resources and the actual availability of such training resources?

3. What might be some benefits of creating educational resources that are field specific? What might some challenges be?

4. Consequences for publishing in a predatory journal were not often discussed in the reviewed training resources. Working individually or in groups, list some possible consequences for publishing in predatory journals.

5. Most training resources did not include case studies. Come up with a fictional case study that might help future researchers learn about the pitfalls of predatory publishing.

Activities

Activity One: Training at Your University?

This chapter provides links to a large assortment of training materials collected from universities across the US. Do a web search to see what types of resources you can find for your home institution.

Using the evaluation criteria/coding scheme described in this chapter, identify what elements are reflected in these training materials, and what elements are not reflected. How could they be improved?

- Who is the training material from? What unit on campus?
- Is there someone named that you could reach out to for collaboration or assistance?
- Do these materials link to any form of vetted 'safe' list of journals (or a third-party directory with such information)?
- Are these materials aimed at any particular audience? Any specific discipline?
- Are there any videos you could show in your classes/lab groups and discuss?
- What types or modalities of information are included, and can any of these be used in your lab in a piecemeal approach?

Activity Two: Integration Into Your Lab

In order for training programs to be successful, senior faculty or lab directors are strongly encouraged to explicitly integrate research ethics trainings into their lab discussions.

- Which aspects of the training resources examined here would be easiest to integrate into your lab for discussion?
- Which aspects of the training resources examined here would be most effective for educating your students about predatory publishing?
- What is the best way for you to assess that your lab students understand this phenomenon?

Activity Three: Examine A Predatory Solicitation Sent to You

One common way that potentially predatory publications solicit manuscripts is through direct email to authors. Find one that's been sent to you. (And be sure to check your Junk/Spam folder!) In our experience, they're not hard to find.

1. Share this email solicitation sent to you with students in your lab group, and ask them to help identify potential 'red flags' or warning signs. One of the more common elements of training materials reviewed here are checklists of the characteristics of potentially predatory publications. Use one of those lists to help walk through a specific solicitation sent to you.

2. Ask your students if they have ever received one of these. If so, ask them to share their own example and dissect it as well.

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