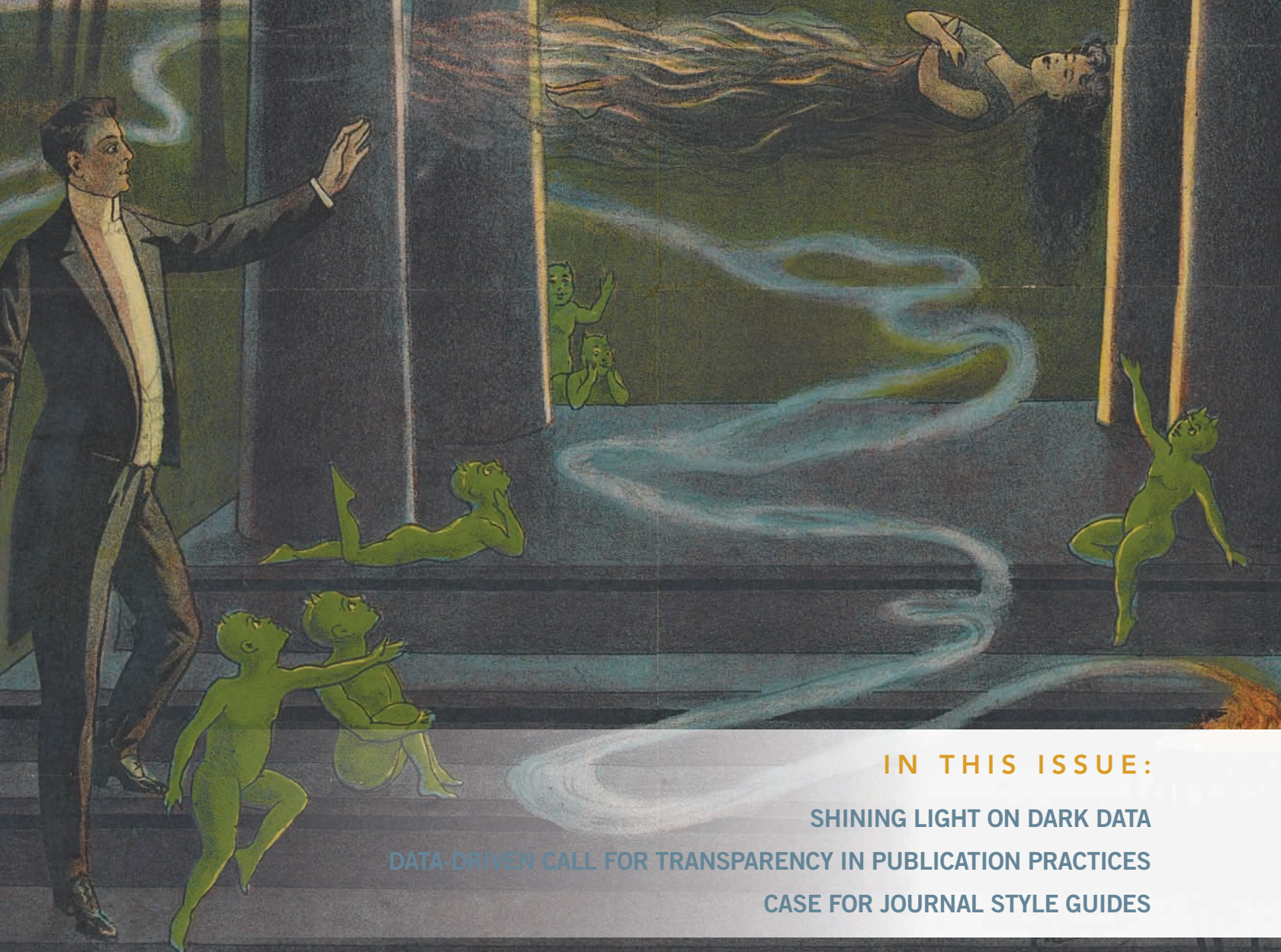


SCIENCE EDITOR



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Compliant with WCAG 2.0

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New web page launched

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New group email discussion platform launched



Science Editor

Monthly newsletter hits member & non-member inboxes

> 100



participants enrolled in a short course at the CSE annual meeting, up from 86 in 2018

Scientific Style & Format



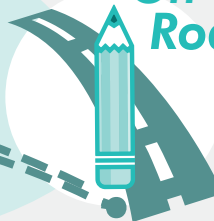
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On The Road



Short courses in Durham and Washington DC, plus the ABEC editor meeting in Brazil

A Look at 2020

Portland



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SPEAK



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- Retraction Resource

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SPRING 2020
VOLUME 43 • NUMBER 1

www.CSEScienceEditor.org

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On the cover: Detail from a poster advertising a performance of the "Hill Magical Co," circa 1900. From The New York Public Library Digital Collections. 1890–1920. Available online at <http://digitalcollections.nypl.org/items/b5c6bf49-a589-7548-e040-e00a18060aef>



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Notes on Transparency: An Elusive, and Illusive, Goal

Jonathan Schultz

Transparency is a common topic when discussing scientific editing and research rigor, serving as the focus of workshops,¹ initiatives,² and more.³ There's even a metric now from the Center for Open Science, the TOP Factor,⁴ to evaluate how journals are implementing transparency guidelines. In *Science Editor*, we've covered transparency—what it means and how to achieve it—quite often, and this issue is no exception. Reviewing the articles in this issue spurred some additional thoughts on this topic that I've collected as follows.

No Panacea. When transparency in research is discussed, it's common to have it mentioned that it's not a panacea. Of course not! Nothing is a panacea, to be fair, but transparency has been integral to science since the beginning, so it can't be expected to fix everything. The first journal articles were letters between scientists explaining their processes; what is happening now is another adjustment of the diopter, bringing more of the research process into greater focus. Science has become more complicated and more collaborative, and the push for greater transparency is necessitated by the former and required for the latter. So many elements and bits of information are required to reproduce or replicate results that asking researchers to spend time tracking them down is effectively preventing that replication from happening, as was shown by initiatives like the Cancer Reproducibility project. Many of the newer transparency guidelines are simply reflecting that the increase in the amount of detail and information is needed to understand and reproduce modern research.

Opportunity, Crimes of. Furthermore, when journals require transparency of data, code, protocols, original figure data, statistical details, etc., etc., it's not with the expectation that these requirements will eliminate fraud. But they certainly make it harder. For example, a number of basic science biomedical journals now require authors to provide uncut gels and blots, highlighting which lanes were used in the article, as supplemental material. This requirement can't thwart a highly motivated fraudster, but it may prevent an author from making an improper splice or duplication to make their data appear more compelling. This requirement, like the best transparency guidelines, should be easy to fulfill for the honest and meticulous researcher, but tough for the corrupt or careless.

Motivated Sharing. In many types of research, in addition to being transparent with your processes and data for replicability, sharing research materials can be just as important. As outlined in the article, "How Life Science Journals Can be Champions of Better Material Sharing and Reporting"⁵ by Angela Abitua, having access to, for example, specific cell lines, plasmids, or experimental organisms can determine whether results can be successfully replicated and built upon. In the past, these materials were "available upon request," which required a significant effort on the part of authors to both request and supply them; now, it is becoming increasingly common for repository services to store, validate, and supply materials, removing this burden from authors. This points to an additional benefit of transparency to researchers: the more that is available from third parties, such as repositories or journals, the less time researchers need to spend responding to requests.

On Glass Houses. As journals require increasing transparency from researchers, would it not be appropriate that editorial operations become just as transparent? That is the question raised by Shroyer and coauthors in the article, "Call for Transparency in Top Biomedical Journals' Publication Practices." The authors reviewed publication patterns of articles in the *New England Journal of Medicine* (NEJM) from 2002 through 2017, comparing author characteristics such as gender and institution, and the differences between authors that had only published once in the journal versus those with multiple publications. The authors lament that NEJM choose not to participate directly with their study and provide de-identified journal database information, which they believe would provide a more accurate picture of their publication practices.

I can understand why a journal may not want to turn over even de-identified data to an external researcher, and the results of the study are interesting even without access to the full NEJM submission records. For example, the finding that female first authors are under-represented (only 13%) is an important point, regardless of how many female first author manuscripts were submitted. However, their call for greater transparency of publishing practices is valid and important. Initiatives such as the PEERE protocol⁶ are working towards this goal, and it seems like developing a standard for the type of submission, acceptance, and demographic data that journals make publicly available is something that CSE should consider.

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Regarding Dark Data. A potentially overlooked aspect of research transparency involves exposing the research that never sees the light of day. This “dark data,” as defined by Sandra Petty, Hugo Stephenson, and Sarah Hadley in their article, “Shining More Light on Dark Data,”⁷ are the negative, inconclusive, or confirmatory studies that are left unpublished in a file drawer or lab notebook. This can lead to publication bias, wherein the effects of a particular treatment, drug, or method appear more positive because that’s what is published, but as the authors outline, as science has moved online and become more open, much of this research has been able to move out of the shadows.

Exposed. One of the impediments to transparency is the vulnerability inherent in being more transparent: The more your share, the more people know, the more they can pick apart. Whether it’s sharing your negative results, details of your research process, peer review reports, or journal submission data, when it’s all out there, someone may find something to attack. This tension is clear to anyone who has tried to move a transparent retraction notice or errata through legal review: Details that might seem helpful to independent researchers are sometime viewed as potentially litigious by lawyers (*disclaimer: the previous statement was a generalization that in no way reflects a real-life event*). However, as greater transparency becomes the norm, not being transparent will likely be seen as suspect on its own. Over time, the exposure that comes with increased transparency will likely become more common and less interesting.

Spoken Words. In the meantime, I find that being transparent can sometimes come easier in person, which is why meetings like the upcoming CSE Annual Meeting can be so valuable. Often, recounting embarrassing details of missteps taken implementing an initiative pour out more freely to a room of colleagues than on the printed page. Likewise, during presentations, questions may be asked revealing worthwhile information speakers didn’t even think to share. This aspect of transparency is at the core of the program put together by co-chairs Emilie Gunn and Peter J Olson of the CSE 2020 Annual Meeting: Advancing Science by Exchanging Knowledge.⁸ As they put it, the meeting serves as a place to be open and share the “indispensable experience, innovation, and expertise that provides CSE members with the tools they need to thrive in the ever-evolving, ever-expanding hinterland of scholarly publishing.”

Ever the Point. In the process of developing a transparent peer review pilot, an editor raised a concern that the posted reviewer comments may include criticisms that, for a host of reasons, may not be fully addressed in

the final published manuscript. In response, some of the other editors, almost in unison, proclaimed “Well, that’s the point!” Concerns raised by reviewers are likely to be shared by readers so by providing the reviewer comments and the authors’ responses, the hope is that these concerns are acknowledged and questions about the peer review process can be preempted. Readers may still believe the concern was not properly addressed by the authors in their posted response, but it is at least clear that the concern was raised and considered.

Classification. As alluded to earlier, transparency is an aspirational goal, and one that can never truly be achieved. To expose all collected data, every element, decision, and step in the research process, or all parts of the review process, is impossible. It is transparent in comparison to what has been done previously, but never truly transparent in an objective sense. Translucent is probably a more appropriate term; broad outlines can be clearly seen, and maybe a few key details, but it is clear that some obscuring occurs. However, referring to your process as translucent could be interpreted to mean that the obscuring is intentional, so transparency, with a caveat, will have to do.

Ruse. It is important to keep that point in mind as the appearance of transparency can be used to deceive. This is the skill of the stage magician: They make the audience believe they are seeing everything when in fact, they only see what the magician wants them to see. To step behind a curtain and claim to make their assistant disappear fools no one; an audience knows to be skeptical of what they cannot see. But to stand on stage, exposed and alone, and make a person vanish with the snap of their fingers will make an audience believe, even if just for a moment, that something magical occurred. “It had to have happened: I saw it all” you might say. But you didn’t, you just think you did and that makes you less willing to think you were fooled.

Transparency provides editors, reviewers, readers, and researchers with the tools to better adjudicate the quality of the science.

Evolution. That concern should not be considered a flaw of the move for greater transparency, but simply a call to remain skeptical (in the true meaning of the word) at all times. As we are still in a transition period during which new standards of transparency are being established, we may see charlatans cloak their fraud in the guise of transparency as a misdirection from their true intent (“as you can see, I have nothing up my sleeve”). Being more transparent is just one of many indicators of trust⁹ in science, but science that is more transparent isn’t inherently truer. Instead, transparency

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provides editors, reviewers, readers, and researchers with the tools to better adjudicate the quality of the science.

Topics Unrelated. Although not directly related to the specific topic of transparency, many of the other articles in this issue of *Science Editor* fulfill a similar purpose by providing behind the scene knowledge and insights. For example, Andrés Martin, previous Editor-in-Chief of the *Journal of the American Academy of Child and Adolescent Psychiatry*, provides details for what he learned as he transitioned the journal to a new EIC, while Peter Olson makes “The Case for Journal Style Guides”¹⁰ and supplies tips for getting them right. This issue also marks the start of three new regular columns: “Style Bites”¹¹ by Stacy Christiansen and the AMA Manual of Style committee; “Getting Social in Scholarly Publishing”¹² by Jennifer Regala; and the return of “Ethical Editor” by Kelly Hadsell and the CSE Editorial Policy Committee.

Summation. Both *Science* and *Magic* may make you exclaim “How did they do that?” but only the magician should be excommunicated for answering the question. To function properly, science needs to be as transparent as possible, providing all the information, data, materials, and more to answer the question.

I hope that *Science Editor* works in much the same way and readers find the answers to their questions through the transparent sharing of information and insights. If you have a “how did they do that?” question, let us know, and we’ll see if we can publish an answer in an upcoming issue.

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An Acrostic by Barbara Meyers Ford

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C lever	N ice	O riginal
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CSE 2020 Annual Meeting: Advancing Science by Exchanging Knowledge

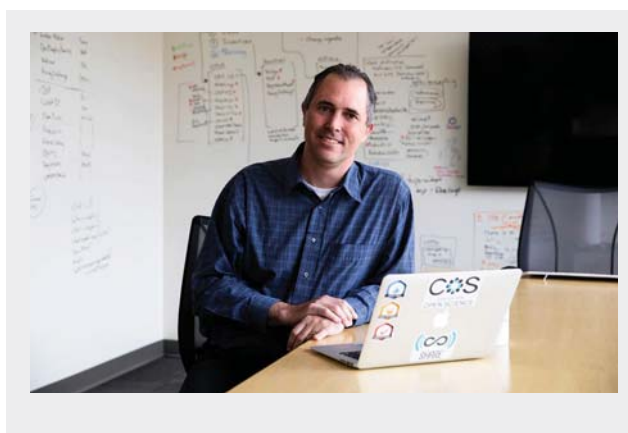
Since the writing of this article, the CSE Executive Board announced that the 2020 Annual Meeting would not be held on its originally scheduled dates due to the multiple extenuating circumstances of the COVID-19 pandemic. The Executive Board and the CSE Program Committee are working diligently to arrange for alternate methods of providing meeting content to CSE members and will release any relevant details as soon as possible. In the meantime, please visit the Annual Meeting home page at <https://www.councilscienceeditors.org/events/upcoming-events/2020-cse-annual-meeting/> for the most up-to-date information.

Emilie Gunn and Peter J Olson

For years, the CSE Annual Meeting has served as a point of convergence for a broad spectrum of professionals within the field of scientific publishing, providing attendees with valuable opportunities for interaction, collaboration, and education. In 2020, CSE's members will convene in a city that itself has a rich history of industry reciprocity, thus emulating the spirit and principles of any organization that strives to support and empower its constituents.

This year's theme, "Advancing Science by Exchanging Knowledge," was inspired by Portland's status as a major hub of mercantile exchange, one where early 19th-century settlers, pioneers, and entrepreneurs could reliably obtain the resources they required for success and survival in the burgeoning Pacific Northwest. Similarly, the CSE Annual Meeting serves as a central source of indispensable experience, innovation, and expertise that provides CSE members with the tools they need to thrive in the ever-evolving, ever-expanding hinterland of scholarly publishing.

With this theme in mind, it's difficult to envision a more appropriate keynote speaker than Brian Nosek, PhD. Dr. Nosek is the Executive Director and cofounder of the Center for Open Science, an organization that enables open and reproducible scientific research practices worldwide, and offers incentives to encourage, tools to enable, and training to foster transparency and reproducibility in all areas of research. His talk, entitled "Improving Openness and Reproducibility in Scholarly Communication," will address how failures in transparency and reproducibility—two core principles of scientific research—can hinder the



dissemination of knowledge and impede advances in science.

We're equally delighted about this year's plenary speaker. Maryam Zaringhalam, PhD, is a Data Science and Open Science Officer at the National Library of Medicine's Office of Strategic Initiatives and Senior Producer for the Story Collider, the latter of which presents true, personal stories about science through live shows and a weekly podcast. In her talk, "Storytelling for a More Equitable Open Science Enterprise," Dr. Zaringhalam will discuss how the age-old craft of storytelling can help bridge the gap between scientists and nonexperts by enabling the latter group to see the human side of science and establish greater trust in the products and process of research.

It wouldn't be a CSE meeting without the perennial array of breakout sessions, which will once again feature dozens of speakers sharing their knowledge about a wide variety of timely topics. Whether you're interested in hearing about alternative publishing formats, peer review recognition programs, social media boosting, style manual updates, or the latest initiatives in equity, diversity, and inclusion, there will be something for everyone. Also, are you an early career

EMILIE GUNN is Associate Director, Journals Editorial for the American Society of Clinical Oncology, and PETER J OLSON is Senior Copyediting Coordinator for Sheridan Journal Services

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professional, remote worker, or editor in chief? If so, you can get a jump on the daily proceedings by attending any one of the roundtable breakfasts dedicated to these three member demographics.

If you want to tap into even more repositories of knowledge, we will once again be offering several short courses in the days just prior to the meeting. By enlisting faculty members who are experts in their respective fields, each course coordinator has created an interactive

experience designed to equip participants with pertinent and invaluable tricks of the trade. The short courses kick off on Saturday with the Short Course for Journal Editors, a 2-day offering that provides editors-in-chief and their colleagues with a thorough, comprehensive overview of their roles and responsibilities. On Sunday, several 1-day courses will cover additional, essential aspects of journal publishing. The Short Course on Publication Management is a workshop for managing editors, production editors, and publication managers that addresses topics such as management and leadership, journal production basics, and metrics. For more seasoned publication managers, the Advanced Course on Publication Management helps participants understand and collaborate on effective solutions for both current and future challenges in the scientific publishing industry. The Short Course on Publication Ethics addresses the myriad ethical issues that can arise in the publication of scientific journals and offers strategies for investigating and resolving breaches of publication ethics. Finally, manuscript editors and copyeditors who want to acquire, enhance, or expand the skills they need for technical and language editing can enroll in the Short Course for Manuscript Editors.

Whether you're arriving early to the meeting or just want to take a break during the proceedings, Portland is a dynamic and vibrant city with no shortage of cultural experiences—including world-renowned street food, several spectacular parks and gardens, and Powell's City of Books, which is a 20-minute walk or a short cab ride from the Portland Marriott Downtown Waterfront. On Sunday, two CSE-sponsored excursions will be offered: a guided stroll through the Portland Japanese Garden and a leisurely cycling tour that makes pit stops at some of Portland's famed food trucks.

We're really excited about this year's program—as well as its setting—but most of all, we're looking forward to another opportunity to commune with, collaborate with, and learn from our esteemed peers in the exciting world of scientific publishing. We hope to see you in the City of Roses!

Shining More Light on Dark Data

Sandra Petty, Hugo Stephenson, and Sarah Hadley

In this article, the team at the NY-based, nonprofit Center for Biomedical Research Transparency (CBMRT)¹ discusses the conditions which generate dark data and how providing a mechanism for publishing high quality negative and inconclusive results alongside “positive” ones is helping to shine more light on these valuable biomedical data.

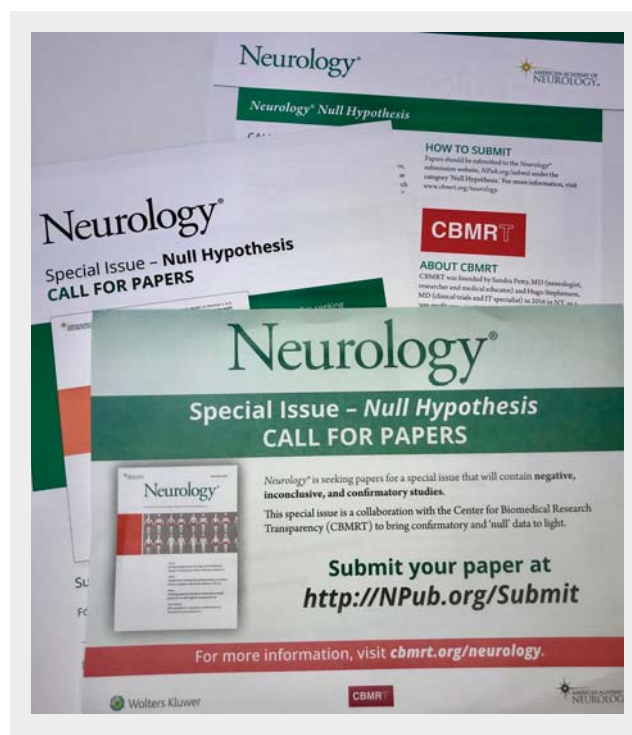
What is Dark Data?

Publication bias is a well-known issue among scientists and clinicians. Journals often like to publish positive, headline-catching results; it's good for business. It is estimated that for clinical trials alone, positive results are almost twice as likely to be published as negative or inconclusive results.² This incentivizes scientists to put their negative or inconclusive findings—from nonetheless well-designed and executed studies—in the bottom drawer, leading to an incomplete picture of research across many scientific fields. These unpublished negative and inconclusive data exist as dark data, hidden in lab books around the world, undiscoverable to future researchers, and useless to clinicians who might value this knowledge when making treatment decisions (e.g., “Drug X worked in three out of three published trials, but what about the three unpublished ones?”). Per neurologist and CBMRT co-founder Dr Sandra Petty:

“As a physician, this issue is concerning; it is no less concerning for patients. To quote one of my astounded patients: “Don’t you know all this already?!”

Evidence suggests that over half of clinical trial results remain unpublished 30 months after trial completion (and one-third remained unpublished 51 months [median] post trial completion).³ This figure is likely to be significantly higher for biomedical research in the laboratory, which is harder to track with limited preclinical research registries and information.

PROF SANDRA PETTY is co-founder and CEO of Center for Biomedical Research Transparency (CBMRT). DR HUGO STEPHENSON is co-founder of CBMRT. SARAH HADLEY is Deputy Director of CBMRT.



Dark data also represents significant research waste, which an issue now very much in focus among funders and the scientific community as scientists may actually duplicate research that has already been completed but never published. By some estimates upwards of 80% of medical research funding is wasted, which equates to around \$160 billion in global medical research spend per annum.⁴ This figure includes wastage not just through non-publication of research, but also through unclear, incomplete, or inaccurate published results and poor study design. Put simply, researchers conduct many experiments and trials as a result of research funding they receive. Researchers often select the research with the best, usually positive results, in which to invest their time to write up and submit for publication. But most of the experiments and their results are never written up, let alone submitted for publication or made discoverable for future researchers. This creates an

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environment where future grant recipients have no ability to learn from prior work that has ultimately been funded by donors and taxpayers.

Why Does Dark Data Exist?

The causes of dark data are multifactorial⁵ and span the spectrum of research and reporting activity.

At one extreme, in a highly competitive research environment, there exists a perception amongst researchers that drawing attention to efforts that have been unsuccessful in demonstrating an expected outcome can work against their career goals and chances of future funding. In a data-driven world, changing this perception goes to the heart of research culture, and involves recognizing and celebrating those who have pursued well-planned and designed avenues of research, even if those results are not “positive.”

At the other extreme, competition for space in top-tier peer reviewed journals has meant that null hypothesis manuscripts have faced a high bar for acceptance and compete against papers with positive results, which could be seen to have higher commercial value in terms of attracting citation, subscriptions, and reprints. This results in repeated experiences of manuscript rejection. Many journal editors, believe, despite evidence to the contrary, that null hypothesis articles are less likely to be cited in future papers, with citation being used as a crude indicator for research relevance and impact. In addition, the “novelty” of a study can be a consideration for journals. That is, in making publication decisions, journals often assess whether the research is “new, true, and does anyone care.” Negative, inconclusive, and confirmatory results may not meet journals’ expectations for novel and unique research. Since the analysis, writing, and manuscript drafting processes are time consuming for time-poor researchers, many choose to focus their efforts on research that they perceive has a greater chance of publication success. Changing this perception requires close interaction with major journals, their editorial teams, and establishment of dedicated space for well-designed studies that result in negative and inconclusive outcomes.

What to Do About Dark Data?

The emergence of the modern open science movement almost two decades ago has spurred a near-continuous development of innovative tools and initiatives that form today’s open science infrastructure. Undoubtedly, these developments have helped bring the issue of dark data to light:

- **Open access mega journals** such as *BMJ Open* and *Medicine* are helping get more dark data published by giving less consideration to novelty, and greater acceptance of negative results and confirmatory studies
- **Open data initiatives** including open source software and workflow tools and data sharing initiatives, of which there are over 300 in biomedicine alone. These include Figshare, YODA, the Genomic Data Commons, and FAIR (Findable, Accessible, Interoperable, and Reusable) Data Principles which promote access and utilization of existing electronic data, algorithms, and analytical tools. These initiatives help to make dark data more discoverable. Therefore, even if a study has not resulted in publication the underlying data are now easily sharable.
- **Preprint servers** where researchers can upload complete scientific manuscripts to a public server. Almost 2,400 biology preprints are being added to public servers such as bioRxiv and PeerJ each month, and the recent launch of MedRxiv has extended the service into medical, clinical, and related health sciences. Preprint servers provide an opportunity for researchers to share their preliminary results in the interests of both drawing early attention to their work and of adding to a knowledge set in a more timely manner. Well executed negative, inconclusive and confirmatory studies receive equal representation alongside positive results.
- The **Declaration on Research Assessment (DORA)** is a set of recommendations designed to improve the ways in which the outputs of scholarly research are evaluated. The Declaration currently has over 12,800 individual signatories and 872 scientific organization signatories. By encouraging a shift away from publication metrics towards making assessments based on scientific content, publication bias is downplayed and reporting of otherwise dark data incentivized.
- The **Consolidated Standards of Reporting Trials (CONSORT)** is an evidence-based, 25-item checklist endorsed by 585 journals for reporting randomized trials and is designed to improve completeness and transparency in trial reporting. Placing greater emphasis on reporting underlying methodology serves to level the playing field between high quality positive, negative, and inconclusive results.
- **Funder evaluation tools.** As funders focus more on the outcomes of their medical research expenditure, they will increasingly rely on platforms such as Digital Science’s “Dimensions” which leverage machine learning and NLP technologies to build connections between clinical trials, publications, policies, and patents data and in turn track research impact through customized metrics. At a minimum, dark data resulting from research grants will be more readily identifiable.

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It would seem however that this impressive open science infrastructure may be a necessary but not completely sufficient set of resources to achieve research transparency to the degree that dark data is brought to light. Our view is that a continuing shift in research culture across the biomedical research ecosystem is also needed to achieve a permanent state of transparency. We envisage an environment where researchers are enabled to utilize more of these resources, and where research output incentives and funding trends are redefined.

Culture change comes about through a combination of different drivers such as technological changes and invention, network and infrastructure creation, leadership, exchange, and education, and does not require significant investment. As noted by the Royal Society as part of its Research Culture Program (which focuses in particular on research integrity):

*"Enhancing research culture doesn't require major effort and resources. Organizations across the UK and globally have made changes linked to integrity that have improved their research culture. These range from simple approaches such as using informal communication channels to nurture a supportive environment, discussing successes and 'failures', to embedding research integrity into the heart of institutional culture, requiring research leaders and senior administrators to lead by example."*⁶

The Center for Biomedical Research Transparency (CBMRT) is another non-profit organization focused on enhancing research culture by facilitating transparent reporting of biomedical research. CBMRT's goal is to ensure that all biomedical results, including negative and inconclusive results (dark data), are discoverable and accessible in the interests of patient safety and research efficiency.

To achieve this, CBMRT works with major medical societies and their existing, highly respected journals to call for papers with null or inconclusive data and publish as a special edition called Null Hypothesis. This initiative is directly changing research culture by reducing the probability of manuscript rejection, and celebrating researchers who write their dark data with publication in journals of impact for their peers. As noted by one Null Hypothesis author, Dr Kevin Messacar:

"I applaud the efforts of CBMRT in combatting publication bias. Considerable effort was put into gathering the retrospective data from the clinical experience of off-label fluoxetine use for AFM with great uncertainty whether anyone would publish it without positive findings. The study was conducted with equipoise given the ultimate goal of figuring

*out whether this novel use of the drug as an antiviral was having any clinical impact. We were so pleased that, despite the negative findings, Neurology gave it fair consideration and chose to feature it in the null hypothesis edition. If we don't publish what doesn't work, it will take us much longer to get to what actually works."*⁷

CBMRT's first Null Hypothesis partnership, launched with the American Academy of Neurology (AAN) and its flagship journal *Neurology* has been a great success, resulting in a thirty-fold increase in inflow of papers documenting negative and inconclusive findings, and significantly raised awareness of such data and its value across the international community of neurologists. In April 2019, CBMRT and *Neurology* produced and circulated a full edition of *Neurology* dedicated to papers with negative and inconclusive findings, with the articles achieving above average levels of citation and even attention in the lay press. Null Hypothesis articles go through the same peer review process as all other *Neurology* submissions and are made freely available online ahead of print. As a result of this success, CBMRT is formalizing a long-term partnership with AAN and *Neurology* for future editions of *Neurology* Null Hypothesis, and working with major societies to replicate the model in other therapeutic areas including cardiology, oncology, and infectious disease.

Negative results journals have been attempted in the past (most notably the *Journal of Negative Results in Biomedicine* from Springer/BioMed Central) with somewhat limited success. The key to the success of Null Hypothesis is that it is the product of collaboration: medical societies and their journals contribute the publishing infrastructure and CBMRT leverages its Global Ambassador Network of over 1,000 biomedical professionals to generate a steady flow of journal submissions. Furthermore, Null Hypothesis is a model that is easily replicable across therapeutic areas, creating a commonly-branded and identifiable movement that puts an infrastructure for dark data publication firmly in the research mainstream.

The Null Hypothesis initiative runs alongside CBMRT's US-European Biomedical Transparency Summit Series. The annual, free summits engage and connect a diverse group of stakeholders across the spectrum of biomedical research activity and drive the culture change required to increase transparency. Outstanding speakers across the United States and Europe are invited from government, industry, academia, and the not-for-profit sector. Summit participants are similarly diverse; CBMRT focuses in particular on ensuring that early career researchers and patient-centered research organizations are well-represented. The Summits

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cover a wide range of transparency topics including policy developments, evolution of the publishing model, data sharing innovations, and research methodology.

There are several other successful initiatives focused specifically on driving culture change towards greater transparency in biomedical research. There are awards which signal the importance of publishing data where the results do not confirm the expected outcome or original hypothesis, such as the ECNP Preclinical Network Data Prize for published “negative” scientific results, and the Symbiont Awards which recognize exemplars in data sharing practice. The AllTrials–BMJ “Unreported Clinical Trials of the Week” campaign draws attention to the need for greater transparency on clinical trial methods and results by shining a spotlight on clinical trials that haven’t published results. And the ReproducibiliTea journal club initiative is now running in 27 countries, bringing young university researchers together across disciplines to discuss diverse issues, papers, and ideas about improving science.

As clinicians and scientists, we are in so many ways indebted to the quality of research that has gone before us to gain understanding of diseases and therapies, to inspire and inform our own research study design, and most importantly to inform and optimize treatment outcomes for our patients. However, unless we achieve balanced and transparent reporting through the revelation of dark data we risk an incomplete understanding of the state of our field, of our treatments, and of the scientific evidence-based

knowledge we share with research participants and patients. The infrastructure exists; the task remains to capitalize on this by continuing the positive shift in research culture across the biomedical ecosystem.

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The Case for Journal Style Guides

Peter J Olson

Style guides. I've spent the better part of my 28-year career conceiving, constructing, and curating them—and although I've formed some strong opinions about what makes a good guide, the more I work with them, the more I realize there isn't one, perfect formula. The one thing I do know, though, is that an in-house style guide is an indispensable element of any journal that aspires to achieve consistent, coherent presentation while publishing high-quality content.

Let me be clear: I'm not necessarily advocating for an in-house guide alone. Indeed, most journals subscribe to at least one of the major style manuals. Whether it be ACS (*The ACS Style Guide*), AMA (*AMA Manual of Style*), Chicago (*The Chicago Manual of Style*), CSE (*Scientific Style and Format*), or any combination of these and/or other references, it's wise to defer to a higher order; doing so establishes a firm, widely known standard that manuscript editors are more likely to know and that authors are more likely to accept when their precious prose has been undone. Furthermore, because these manuals are cited so prevalently within the scientific journal community, to endorse them is to demonstrate that your organization is an invested member of that community. All of this being the case, you may very well ask:

Why, then, do I need an in-house style guide?

Making the Case

Questioning the necessity of an in-house guide is understandable given the considerable breadth of the aforementioned manuals. Regardless of how strictly a general manual is followed, however, it's usually insufficient to rely on it as a singular source—because once the editing begins, any combination of the following factors will come into play.

Inadequacy

Voluminous as they are, none of the major manuals can act as a comprehensive resource for any one journal. Many components and editorial aspects of a journal either will not be covered in a general manual or will be addressed only sparsely; these can range from the mundane (In what order should the title page footnotes appear? Is it *Supporting*

Information or Supplemental Data?) to more sensitive, policy-oriented style points that extend into the editorial domain (e.g., author contributions, conflicts of interest, and claims of primacy). Documenting these requirements in a style guide is the best means of ensuring consistency and compliance from article to article and issue to issue.

Adaptability

In many cases, the guidelines laid out in a general style manual may need to be tailored to the subject matter of a particular journal. For example, AMA style requires that the abbreviations COPD (chronic obstructive pulmonary disease) and RBC (red blood cell) be defined at first mention, but a chest medicine journal may elect to consider them standard to avoid patronizing its target audience.

Individuality

To a certain degree, we all want to stand out in some way, and scientific journals are no exception. Many journals have characteristics that are unique by design, and as such are nowhere to be found in a general style manual. This often manifests in purely superficial ways, as when a journal's page layout affects an editorial style point—but similar idiosyncrasies can extend to the journal's online hosting platform, which may include components that are not present in print but need to be handled delicately and precisely by a manuscript editor nonetheless.

Technology

Speaking of online hosting platforms, manuscript editors are increasingly being required to learn and apply web-based editing programs and XML coding systems to facilitate the presentation of online content, and these technological requirements almost always cross over with editorial style in some way. Whether you integrate these requirements into your editorial style guide or provide them as a supplement is up to you, but they need to be documented somewhere.

Article Types

Article types vary from journal to journal, but different article types often have inherently different style rules that would be difficult to apply correctly or consistently without clear direction. The distinctive characteristics of "special" article types—such as those pertaining to footnotes (e.g., to link companion articles), headings (e.g., for case reports), and reference citations (e.g., for letters and replies)—are often

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critical for reader comprehension, so carving out a place for them in an in-house guide is advisable.

Author Queries

The author query is an art form unto itself, and the way in which a query is worded can often make or break the answer. Establishing standard query language for recurring conundrums, clarifications, and confirmations not only ensures that each author receives the same message, it more often yields the desired response. This goes beyond preferred phrasing—the precise, calculated wording of an author query is often necessary to convey labyrinthine journal policies clearly or to request workflow-dependent information, and the major manuals simply do not (and cannot) delve into such detail.

You'd be hard pressed to find a journal for which none of the above tenets is relevant. Yet agreeing that an in-house style guide is a good idea isn't even half the battle. The task of wrangling these rules into a manual that is at once efficient, efficacious, and user-friendly is a formidable one—but with the proper approach and attention, the payoff can be considerable.

Categorization Is Key

This may go without saying, but the way in which a guide is structured is critical to its usability and efficacy, and the ease and speed with which information can be found can have a profound impact on editing quality. When organizing and categorizing the elements of an in-house guide, always consider the perspective of your users: How and where are they most likely to look for certain information? This is relatively easy to predict for rules that are broad in scope, such as author affiliations or reference types, which can be found easily when deposited in namesake sections; however, other, more subtle style points can be lost in the shuffle if not categorized with care. For example, if a comma is to be used in 95% confidence intervals, remember that a user who is unaware of this rule will not necessarily turn to the "Comma" section of the guide; they will more likely seek guidance in a "Statistics" section given that they don't yet know how (or if) to punctuate these values. Focusing on the user's question—rather than the answer—when categorizing certain style points increases the chances that those points will be discovered.

Careful Cross-referencing

Even with the most effective categorization methods, you can't always predict how any one user will go about looking for answers. For certain article components, though, you can anticipate the different angles from which a user may approach a search, then add cross-references that direct the user to the appropriate section of the guide. For example,

a user who is editing a table with abbreviations that need to be defined in a footnote could conceivably consult the "Abbreviations" and/or "Footnotes" sections of a style guide, when the answer actually resides in the "Tables" section. One temptation would be to simply replicate the information from the latter section in the former two sections; however, adding cross-references in those latter sections (e.g., "See the 'Tables' section") is more efficient and allows you to centralize the information in a pertinent location. Effective cross-referencing not only strengthens the search process, it minimizes the amount of repeat information—which ultimately reduces the potential for introducing discrepancies whenever the guide is updated, since there are fewer places where the same information needs to be revised in the same way.

Effective Examples

I've provided a handful of examples to accompany the points I've made thus far, and for good reason: Examples bring clarity to a concept. No matter how clearly you think you've penned a rule, the smallest subtleties in language can open that rule up to interpretation. Providing a rule that is followed immediately by a concise yet comprehensive example of that rule in action will help your users apply it correctly—but bear in mind that those examples should be realistic and at least somewhat representative of your content. Quirky, tongue-in-cheek examples or example "templates" will only get you so far if they don't resemble your content closely enough for your users to comprehend and implement them. If you'd rather not have to devise your own examples, or if you just want to keep the size of your style guide in check, you can always refer your users to published content—though whether you hand-pick that content or simply refer your editors to your website may depend on how confident you are in the accuracy of what you've published.

Trimming the Fat

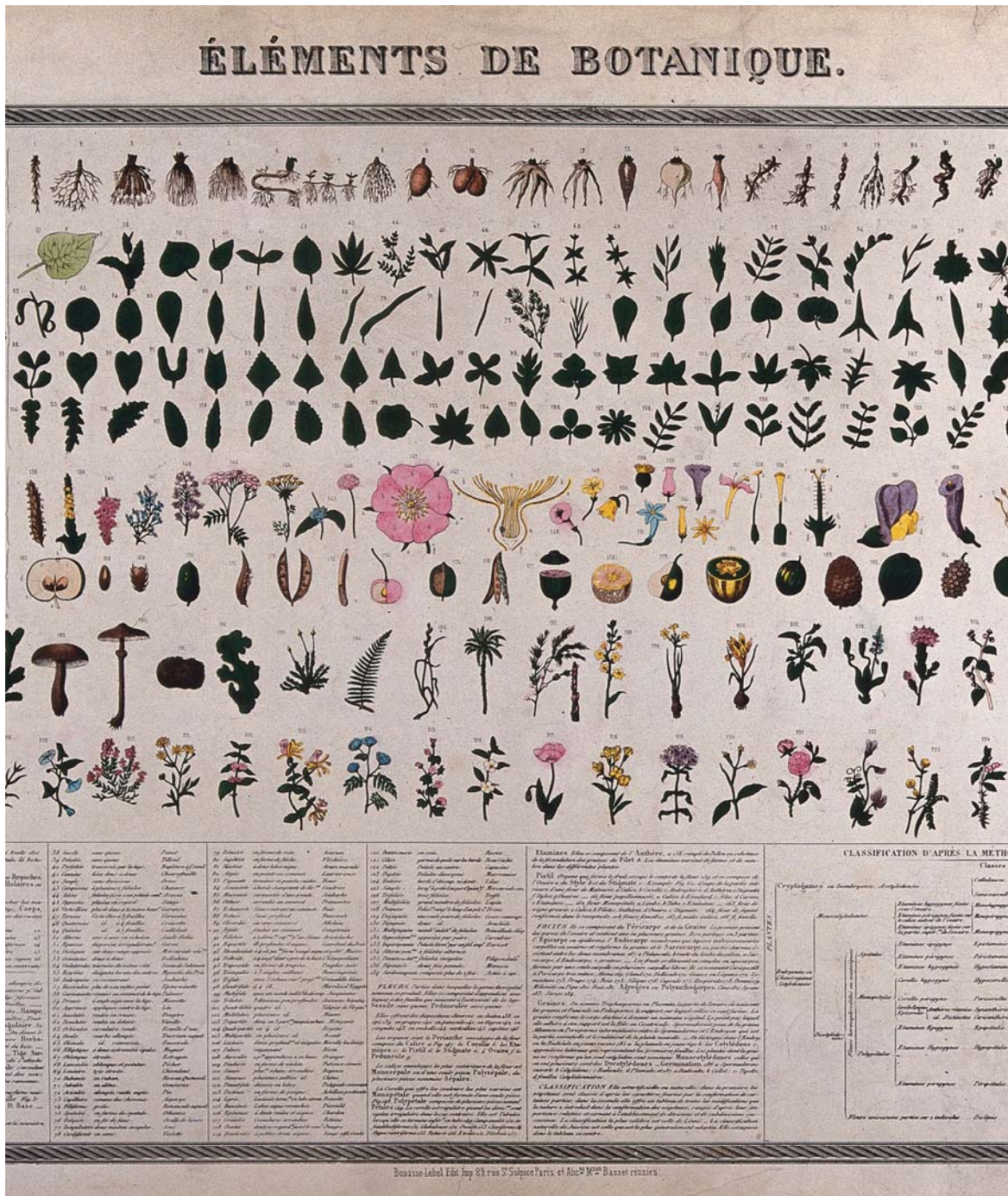
Finally, consider your user base when determining just how much information to include in an in-house style guide. Assuming your users are professional manuscript editors, it's more than reasonable to expect that their knowledge of the English language precludes any reminders of the fundamentals. Do you really need to tell your users that *ensure* and *insure* are not interchangeable, that you should capitalize the first word of a sentence, or that commas should be used to offset a nonrestrictive clause? Doing so is not unlike explaining the difference between a nail and a screw to the contractor you've hired to fix your roof, and it can distract your editors from more nuanced, journal-specific guidelines that require their attention. On the other hand, if you want to free your authors from some of the more prescriptive, deep-seated rules of grammar and usage, it may be prudent

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to include nonconformist precepts such as “Do not change passive voice to active voice” or “Allow split infinitives.”

Benjamin Franklin, in his infinite wisdom, left us with the proverb “For every minute spent in organizing, an hour is earned.” Truer words were never spoken. In my experience,

spending the time up front to carefully plan, construct, and implement an in-house journal style guide not only leads to better editing practices and higher quality, it makes the guide itself easier to update and maintain. And in the end, this investment will turn your minutes into hours—in a good way.

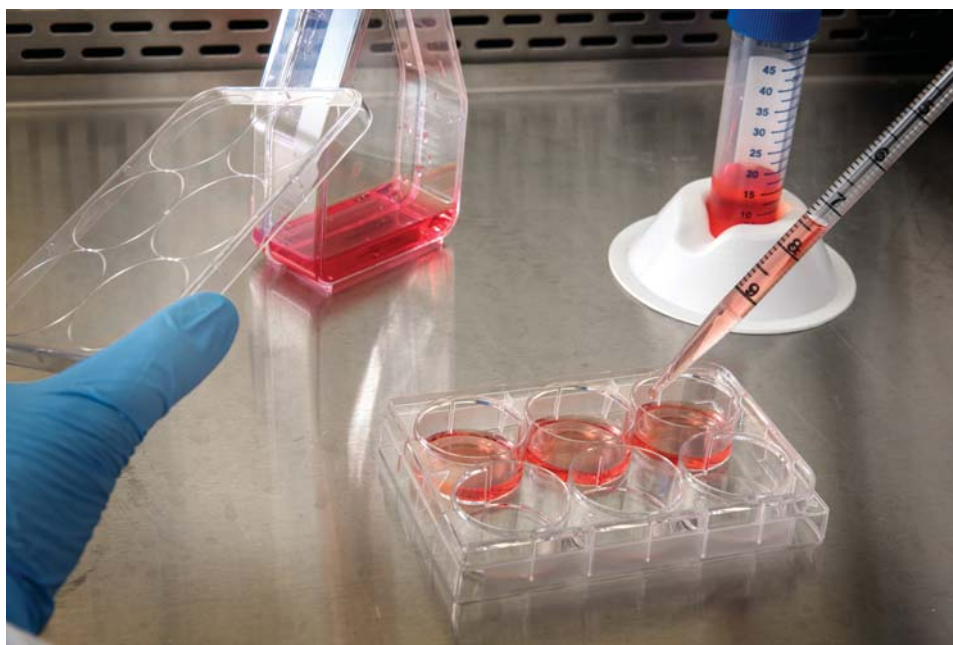


Detail from Botanical classification; 227 figures of plant anatomical segments with descriptive text.
Credit: Wellcome Collection. CC BY 4.0 <https://wellcomecollection.org/works/kgjzhuqz>

How Life Science Journals Can be Champions of Better Material Sharing and Reporting

Angela Abitua

Deposition of biological materials is an important step toward improving scientific reproducibility. Life science journals are uniquely positioned to support better material sharing practices through specific journal requirements.



In September 2019, members of academic institutions, funding agencies, and journals participated in a workshop at the National Academy of Sciences to discuss ways to improve reproducibility in the life sciences—for a great summary, read Jonathan Schultz’s article.¹ It was clear at the meeting that some journals were already taking action by establishing data deposition policies, but I was surprised by the lack of discussion on the sharing of biological materials such as cell lines and plasmids. Similar journal policies for depositing materials should exist to promote reproducible science.

ANGELA ABITUA, PhD, is an Outreach Scientist at Addgene, a nonprofit plasmid repository dedicated to accelerating research and discovery by improving access to useful research materials and information.

In the life sciences, data often come from the collection of information from biological experiments using materials such as cell lines, plasmids, and experimental organisms. Instead of having to make materials from scratch, researchers can save time and money by requesting what they need from a centralized biological repository. For example, it can take years and can cost up to \$20,000 for researchers to make a mouse strain, whereas receiving a verified strain from a repository takes just a few weeks at a fraction of the cost.² Furthermore, if researchers use misidentified materials that they directly requested from an author, it can result in drastically different results and lead to irreproducibility that ultimately creeps into clinical research and drug development.³

The current system of “available upon request” often results in scientists having to wait months to receive samples from the corresponding author or never receiving

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Table. Best Practices for Adding Requirement for a Material Sharing Policy.

Requirements	Example Text	Rationale and Comments
Materials availability	Authors are expected to make an availability statement for biological materials described in their article. Unless restrictions in access or use are stated, authors are required to make these materials available to requesting researchers.	Providing an availability statement informs readers if there are any restrictions to access or use. For example, materials should not be shared if they compromise the privacy or confidentiality of human research subjects.
Deposition of materials	Authors are strongly encouraged to deposit biological materials to public repositories such as Addgene, ⁷ ATCC (American Type Culture Collection), ¹⁴ Arabidopsis Biological Resource Center, ⁹ Bloomington Drosophila Stock Center, ¹⁵ Caenorhabditis Genetics Center, ¹⁶ Coriell Institute, ¹⁰ DNASU, ¹⁷ the European Conditional Mouse Mutagenesis Program, ¹⁸ the European Mouse Mutant Archive, ¹⁹ the Knockout Mouse Project, ²⁰ the Jackson Laboratory, ⁸ the Mutant Mouse Resource and Research Centers, ²¹ and RIKEN BioResource Research Center. ²²	Deposition enables the identification, authentication, and timely access to materials. The list provided in the "Example Text" column is not exhaustive, and only repositories relevant to the journal's scope of research need to be included.
Materials reporting	Authors are encouraged to use Research Resource Identifiers (RRIDs) to uniquely identify the biological materials used in their research. The RRID Portal ²³ lists existing RRIDs as well as information for creating a new RRID if one does not already exist. If known, provide batch or lot number of antibodies.	RRIDs support the unique identification, tracking, and reuse of key research materials. If it is not possible to find or obtain an RRID, the catalog number from the supplier should be stated. Providing examples of how to report RRIDs can be helpful to authors. Requiring a material resource table encourages more complete reporting of all materials used.

a reply and having to remake the materials themselves. Lack of access slows down research and can lead to irreproducible results, hindering scientific progress. The Cancer Reproducibility project sought to replicate 50 publications but came to a premature stop⁴ when reagents weren't available from the labs that had originally made them. To guarantee timely access to published materials, journals should make it mandatory to deposit such data before publication.

When authors don't sufficiently identify the materials used in their study, results can be impossible to reproduce effectively. The deposition of materials enables more transparent reagent reporting. Many repositories assign materials a persistent identifier, such as Research Resource Identifiers (RRIDs),⁵ and

create an information page that captures relevant details. For deposited samples, authors can simply provide the link to a material's curated repository page, making it easy for readers to find the information they need.

When authors don't sufficiently identify the materials used in their study, results can be impossible to reproduce effectively.

For further improved reproducibility, it should be mandatory that all materials are authenticated.⁶ A requirement that authors deposit materials before publication allows independent validation by repositories. Many repositories perform routine quality control: Addgene⁷ sequence verifies all plasmids,

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Jackson Laboratory⁸ genotypes their mice, Arabidopsis Biological Resource Center⁹ performs quality control on seeds, and the Coriell Institute¹⁰ authenticates cell lines.

You might be thinking, aren't these repository services expensive? First, it's typically free for scientists to donate materials. Additionally, many repositories are nonprofit organizations, and the requesting fees cover the cost of maintaining the service for the community as a whole. In the long run, it's actually more cost-effective for everyone to deposit. It saves authors the burden of having to ship out requested materials multiple times. Researchers who make the requests also save time and money by not having to recreate materials (e.g., an entire mouse line).

Deposition ensures timely access to materials and ultimately facilitates reproducibility. Journals can promote this best practice by updating their material sharing policies in their Author Instructions to require deposition and by reminding authors about the requirement during peer review. Journals such as *PLOS*,¹¹ *eLife*,¹² and *AHA/ASA Journals*¹³ are already paving the way with comprehensive material sharing policies, and it's time for others to follow suit.

If you are a life sciences editor wanting to create or update a material sharing policy for your journal, the Table shows some best practices for adding this requirement.

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Call for Transparency in Top Biomedical Journals' Publication Practices: New England Journal of Medicine's 2002–2017 Publication Patterns

BM Carr, JE Krstacic, C Zhu, J Saragossi, J Yang, and AL Shroyer

Abstract

Importance: High-impact journals (e.g., *New England Journal of Medicine* [NEJM]) transform clinical practice; these publications have been commonly used to quantify faculty performance in academic medical centers' promotion and tenure decisions.

Objectives: To support scientific transparency, the "unwritten" NEJM publication priorities and trends were documented.

Design/Setting: From 2002 to 2017, PubMed extracts for all original NEJM research articles with a structured abstract ($n = 2,419$) were analyzed. For a sampling of articles, supplementary information was obtained from publicly available resources.

Participants/Exposure: The NEJM author and research project characteristics were compared for the first authors with multiple first author publications (MP) vs. those with a single publication (SP).

Main Outcome(s) and Measure(s): Publication-specific characteristics included National Library of Medicine medical subject headings disease category, clinical trial design, grant

funding, coauthor count, collaborating author count, and other study-specific details (e.g., directionality of overall findings). First author-specific characteristics included gender, advanced degrees held, self-designated major clinical specialty, institutional location, and academic rank.

Results: There were 2,065 first authors identified, of which 88% ($n = 1,816$) were SP first authors; these 1,816 SP first authors represented 75% of publications. Compared to SP first authors, MP first authors more often published clinical trials (96% vs. 80%; $P < 0.001$), had more collaborators (mean = 195 vs. 100; $P = 0.006$) since 2008, and were more frequently grant-funded (54% vs. 42%; $P < 0.001$). For a sampling of abstracts, MP vs. SP publications reported positive findings less often (73% vs. 96%, $P = 0.036$); MP first authors were more frequently cardiovascular disease-focused (28% vs. 17%, $P < 0.001$). Overall, female gender was under-represented for both SP and MP first authors (13%).

Conclusions: Given striking differences in NEJM MP vs. SP first authors and publication characteristics, academic faculty hopeful to publish multiple times in a top-tier biomedical research journal should review historical journal-specific publication practices.

Relevance: Given the avalanche of open access journals, the biomedical science academic community now stands at the crossroads of a new "bibliometrics" revolution. These preliminary NEJM-specific patterns raise important research questions; to rigorously document journal-specific publication/authorship variations, biomedical science journals' enhanced transparency with public reporting now appears warranted.

Background

In academic medicine, performance metrics (i.e., bibliometrics) are increasingly being used to gauge biomedical science research faculty members' productivity.

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*Both Dr Carr and Mr Krstacic should be considered as first authors, contributing equally.

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For example, the H-index is becoming a common indicator of academic output. The H-index calculation includes the number of times that a faculty member's peer-reviewed publication was cited in other scientific works.¹ Therefore, the likelihood that a faculty member's publication will become "highly cited" is related to their publication journal's impact factor, a metric that is based in part on citations received and articles published within the preceding two years.² In addition to readership statistics, impact factors also measure a journal's importance and potential impact upon transforming future healthcare practice.

The New England Journal of Medicine (NEJM) has the highest current impact factor in biomedical research, trending upward from 55.9 (2014) to 79.3 (2017). In general, biomedical researchers strive to publish in top-tier journals like NEJM; ideally, attaining not just a single first author publication (SP), but multiple first author publications (MP) in NEJM. Some academic institutions even provide financial incentives to publish in top-tier biomedical journals such as NEJM, with Chinese researchers reportedly receiving a prize of 500,000 Chinese Yuan for having a paper published in a highly regarded journal.³

The number and timing of first author publications produced by individual scientists may be complex and challenging to predict, as multiple factors (e.g., use of medical writers) may contribute to an academician's productivity. Prior studies have identified an inverse relationship between an author's number of NEJM papers published and the time to a subsequent NEJM publication.⁴ Previous work has shown coauthor team size has more than doubled within the field of medical research over the second half of the 20th century.⁵ However, it is not known whether first authors with larger author teams are more successful in achieving additional first author publications in a top-tier journal. Beyond the number of coauthors, the number of collaborators (i.e., the number of local site investigators participating in a multicenter, randomized, controlled clinical trial) may also be an important factor related to successful research publications. The impact of collaborating author team members has not been previously researched. The purpose of this study was to identify trends in factors related to MP vs. SP NEJM authors to promote greater transparency and potentially provide guidance to future authors wishing to achieve MP author status.

Research Questions and Approach Used

For NEJM original research articles published 2002–2017, this study compared MP vs. SP first authors for the following:

- Differences in coauthor team member count;
- Differences in collaborating team member count;

- Differences in focus across major diseases (based on National Library of Medicine medical subject headings [MeSH]);
- Differences in study designs used (i.e., proportion of clinical trials); and
- Differences in grant funding.

Correspondingly, this study's null hypothesis was that "... there would be no differences in SP vs. MP authors for their publication's coauthor counts, collaborating team member counts, the major disease focus, the study design used, as well as the grant support received."

The Medline records for all NEJM publications from January 1, 2002, through December 31, 2017, were extracted from PubMed; records were identified as being an original journal article (based upon Medline publication type) containing a structured abstract vs. another NEJM publication type (e.g., commentary, editorial, perspective, or case report/case series). Of the 2,484 NEJM original journal articles, 65 (2.6%) did not contain a structured abstract and were excluded. The final study database contained 2,419 NEJM records.

First authors were classified as MP or SP for NEJM publications during the study time period. For NEJM articles that credited a named study group (but not individual authors), the publication's appendix was reviewed to identify authors. For MP first authors, the time from their initial NEJM original journal article to their second original journal article was calculated. For MP first authors with greater than two publications, the time between the initial and latest NEJM publications (prior to December 31, 2017) was calculated.

For each publication, the coauthor and collaborating author counts, study design (i.e., clinical trial), grant funding, and major disease topic by MeSH classification were identified. All analyses involving collaborating author counts were limited to publications since 2008, as that was the first year that Medline began consistently reporting collaborating authors. Based on proportions of MP vs. SP NEJM articles with these major MeSH classifications, the most frequent MeSH categories were compared. Collaborating authors were defined as those team members mentioned or acknowledged in the manuscript but not included in the author listing. Unless a new study-specific variable was separately defined, standard Medline data field definitions were applied.

Supplementary data, including author-specific characteristics (i.e., gender, advanced degrees held, self-designated major clinical specialty, institutional location, and academic rank) and publication-specific characteristics (e.g., population[s], intervention[s], comparison[s], outcome[s], and directionality of overall findings), were extracted from publicly available websites for a pilot set of records. For detailed methods, see the supplementary Appendix online.

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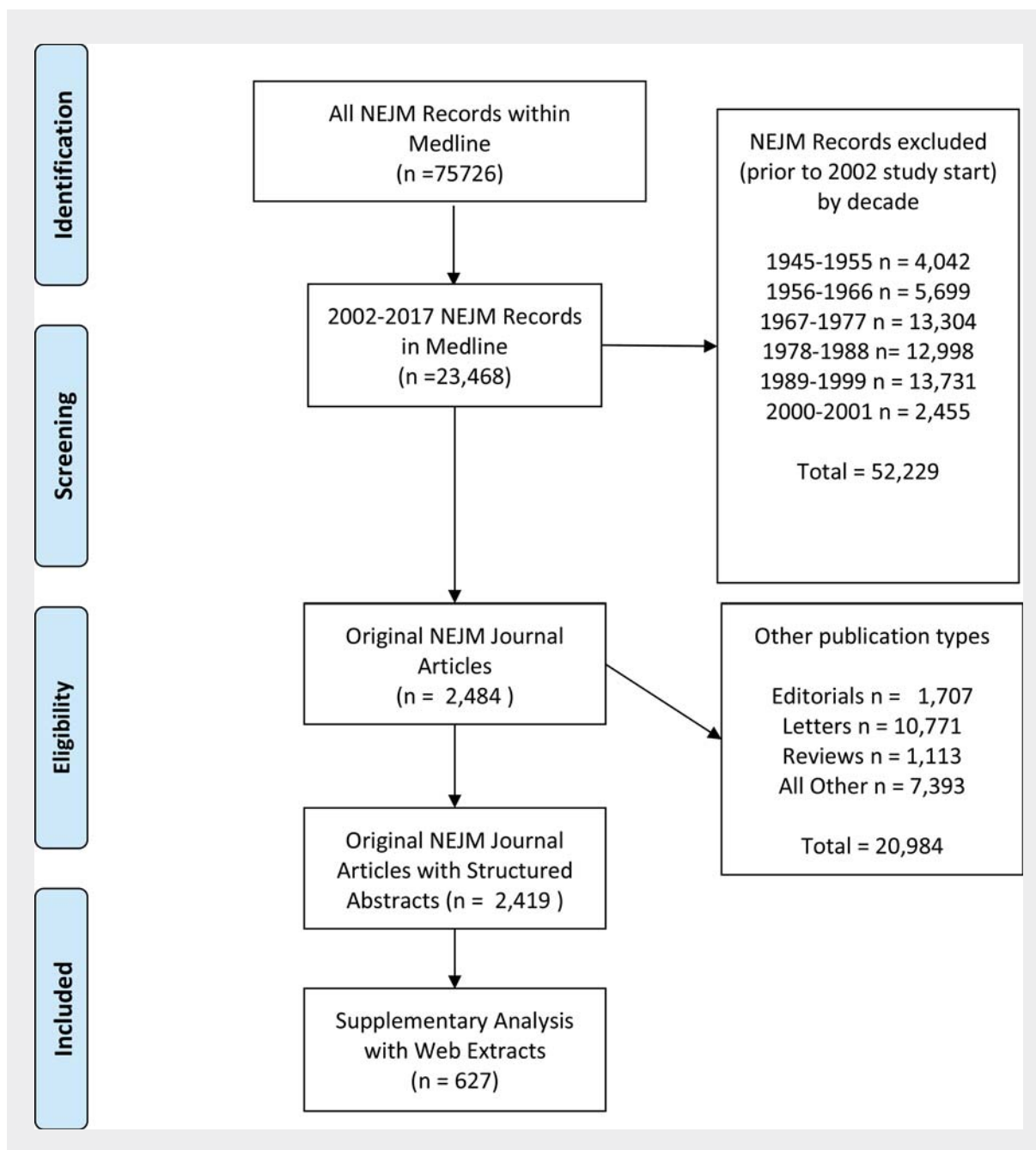


Figure 1. Flow diagram.

Results

Of the NEJM original articles containing a structured abstract, there were 2,419 publications evaluated with a total of 2,065 first authors identified. Of these, 75% ($n = 1,816/2,419$) of tallied publications were classified as SP first author publications; 25% ($n = 603/2,419$) were identified as

MP first author publications (Figure 1). Of the first authors identified, 88% ($n = 1,816/2,065$) were SP first authors; correspondingly, 12% ($n = 249/2,065$) were MP first authors (Tables 1 and 2). Of the MP authors, 74% ($n = 185/249$) had two publications; there were only 3 individuals (1.2%) that had 7, 8, or 9 NEJM publications (Figure 2). From 2002 (19%

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Table 1. Distribution of NEJM First Authors.

PubMed Extract	Total Authors N = 2,065	SP First Authors N = 1,816 (87.9%)	MP First Authors N = 249 (12.1%)	P-value*
Clinical trials	1,689 (81.8%)	1,451 (79.9%)	238 (95.6%)	< 0.0001
CVD-focused articles (limited)	382 (18.5%)	312 (17.2%)	70 (28.1%)	< 0.0001
Grant funded articles	891 (43.2%)	756 (41.6%)	135 (54.2%)	0.0002
Supplementary Web Extract	Total Authors	SP First Authors	MP First Authors	P-value
Author-Related Characteristics	N = 273	N = 24 (8.8%)	N = 249 (91.2%)	
Female gender	36 (13.2%)	2 (8.3%)	34 (13.7%)	0.554
North American-based location	183 (67.0%)	16 (66.7%)	167 (67.1%)	0.9681
Advanced doctoral degree				
Clinical-only doctoral degree(s)	206 (76.3%)	19 (86.4%)	187 (75.4%)	0.409
Scientific-only doctoral degree(s)	13 (4.8%)	0 (0%)	13 (5.2%)	
Clinical + scientific doctoral degrees	51 (18.9%)	3 (13.6%)	48 (19.4%)	
Self-identified major clinical specialty				
Medicine	199 (72.9%)	19 (79.2%)	180 (72.3%)	0.746
Surgery	28 (10.3%)	2 (8.3%)	26 (10.4%)	
Other	46 (16.9%)	3 (12.5%)	43 (17.3%)	
Massachusetts-based location	30 (11.0%)	1 (4.2%)	29 (11.7%)	0.491
Publication-Related Characteristics	N = 627	N = 24 (3.8%)	N = 603 (96.2%)	
At least 1 CVD MeSH term	179 (28.6%)	1 (4.2%)	178 (29.5%)	0.046
At least 1 neoplasm MeSH term	106 (16.9%)	6 (25.0%)	100 (16.6%)	0.351
At least 1 virus disease MeSH term	64 (10.2%)	2 (8.3%)	62 (10.3%)	0.691
At least 1 "Top Three" MeSH term (CVD, neoplasm, virus disease)	349 (55.7%)	9 (37.5%)	340 (56.4%)	0.126
Positive directionality of findings	461 (73.5%)	23 (95.8%)	438 (72.6%)	0.036
Overall directionality of findings				
Positive	461 (73.5%)	23 (95.8%)	438 (72.6%)	0.015
Neutral	121 (19.3%)	0 (0%)	121 (20.1%)	
Negative	45 (7.2%)	1 (4.2%)	44 (7.3%)	

*For the three variables under "PubMed Extract," five "Author-related Characteristics" under "Supplementary Web Extract," and "Overall Directionality of Findings," *P*-value was based on Chi-square tests with *P*-value from Monte Carlo simulation; for the first five binary "Publication-related Characteristics," *P*-value was based on generalized linear mixed model with authors as random effect. NEJM = *New England Journal of Medicine*; CVD = cardiovascular disease; MeSH = National Library of Medicine medical subject headings.

MP first authors) to 2017 (24% MP first authors), there was an increasing proportion of NEJM publications from MP first authors ($P = 0.037$; Figure 3).

For the MP first authors, the average time from initial publication to second publication was 4.2 y (SD = 3.2 y), and

the average time from initial publication to last publication (prior to December 31, 2017) was 7.6 y (SD = 4.0 y; MP subgroup $N = 64$). This 4.2-year gap (between initial to second NEJM publication) appears quite close to the maximum time period (i.e., 5 y) funded by NIH Research Project Grant Program grants.

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Table 2. Distribution of NEJM First Authors' Publications—Trends Over Time.

	Total 16 Years (2002–2017)	Early Period (2002–2007)	Mid-Period (2008–2012)	Late Period (2013–2017)	P-value*
All Publications	2,419	820	744	855	
SP publications	1,816	638 (77.8%)	545 (73.3%)	633 (74.0%)	0.204
MP publications	603	182 (22.2%)	199 (26.8%)	222 (26.0%)	0.217
Clinical Trials	2,016	629 (76.7%)	638 (85.8%)	749 (87.6%)	
SP clinical trials	1,451 (80.0%)	465 (72.9%)	451 (82.8%)	535 (84.5%)	0.013
MP clinical trials	565 (93.7%)	164 (90.1%)	187 (94.0%)	241 (96.4%)	< 0.001
CVD-Focused	490	161 (19.6%)	166 (22.3%)	163 (19.1%)	
SP CVD-focused	312 (17.2%)	106 (16.6%)	101 (18.5%)	105 (16.6%)	0.992
MP CVD-focused	178 (29.5%)	55 (30.2%)	65 (32.7%)	58 (26.1%)	0.400

*P-value was based on log-linear Poisson regression models with correction for over-/under-dispersion. CVD = cardiovascular disease; SP = single first author publication; MP = multiple first author publications.

Overall, the average number of coauthors per publication was not different between MP vs. SP first authors (16 vs. 16, $P = 0.221$; Supplementary Figure 1). Across early-, mid-, and late-study time periods, the number of coauthors increased over time for both MP and SP; over these time intervals, the linearly increasing rate for coauthor counts was higher for SP vs. MP ($P = 0.033$).

The average number of collaborators per publication was 130, with significant MP vs. SP differences (216 vs. 100, $P < 0.001$; Supplementary Figure 2); no significant trend over time in collaborators per publication was observed ($P = 0.6882$ for SP, $P = 0.2615$ for MP). In contrast to the coauthor count/publication findings, the linearly increasing rate for collaborating authors/publication was similar between MP and SP authors ($P = 0.4580$).

The proportion of MP (96%) vs. SP (80%) clinical trials published was different ($P < 0.001$). From 2002 to 2017, there was an increasing proportion of clinical trials published as time progressed for both MP (relative risk [RR] = 1.006 with 95% confidence interval [CI] [1.001, 1.011]; $P = 0.011$) and SP first authors (RR = 1.015; CI [1.006, 1.024]; $P = 0.002$); there was no difference in these trends ($P = 0.198$). Classified by early/late time periods, there remained an increasing trend over time for both MP ($P < 0.001$) and SP first authors ($P = 0.013$), with no significant difference in MP vs. SP patterns ($P = 0.322$).

Among clinical trials, there were no differences in the MP vs. SP average coauthor counts/publications (SP = 16, MP = 17, $P = 0.249$); since 2008, however, there were dramatic differences in the average collaborating author counts for publications (SP = 116, MP = 226, $P < 0.001$; Supplementary Table 1). Correspondingly, the total author counts for publications since 2008 (adding coauthors and

collaborating authors) were larger for the MP vs. SP clinical trial publications (244 vs. 134, $P < 0.001$).

For the supplementary data, the top three MeSH disease-related topics were cardiovascular disease (CVD), neoplasms, and viral diseases varying for MP vs. SP first author publications; the CVD-related publication rates varied for MP (28%) vs. SP first authors (17%; $P < 0.001$), but CVD-based publication rates did not change over time for either MP or SP first authors ($P = 0.139$ and $P = 0.999$, respectively).

The rate of NEJM first authors having at least one grant-funded article was high (43%). Although MP first authors were more likely than SP authors to have reported grant funding (54% vs. 42%; $P < 0.001$), there were no differences between the SP vs. MP funding trends over time ($P = 0.934$).

Supplementary data about first authors, institutions, and abstract-specific details were extracted by two authors from publicly available websites for a pilot set of these publications. The inter-rater reliability of the supplementary data capture was evaluated with > 80% agreement and Kappa upwards of 0.7, thus indicating good concordance between these two raters.

Using this supplementary data, the SP vs. MP first author characteristics of gender, institutional location (i.e., North America-based or Massachusetts-based, the state in which NEJM is based), self-designated major clinical specialty, and advanced degrees held (i.e., clinical vs. scientific vs. combined doctoral degrees) were evaluated. For this pilot study evaluating MP and SP first author differences, there was no statistically significant female gender difference (14% vs. 8%; $P = 0.554$), clinical specialty difference (i.e., medical specialty = 72% vs. 79% and surgical = 10% vs. 8%; $P = 0.746$), difference in North American location (67%

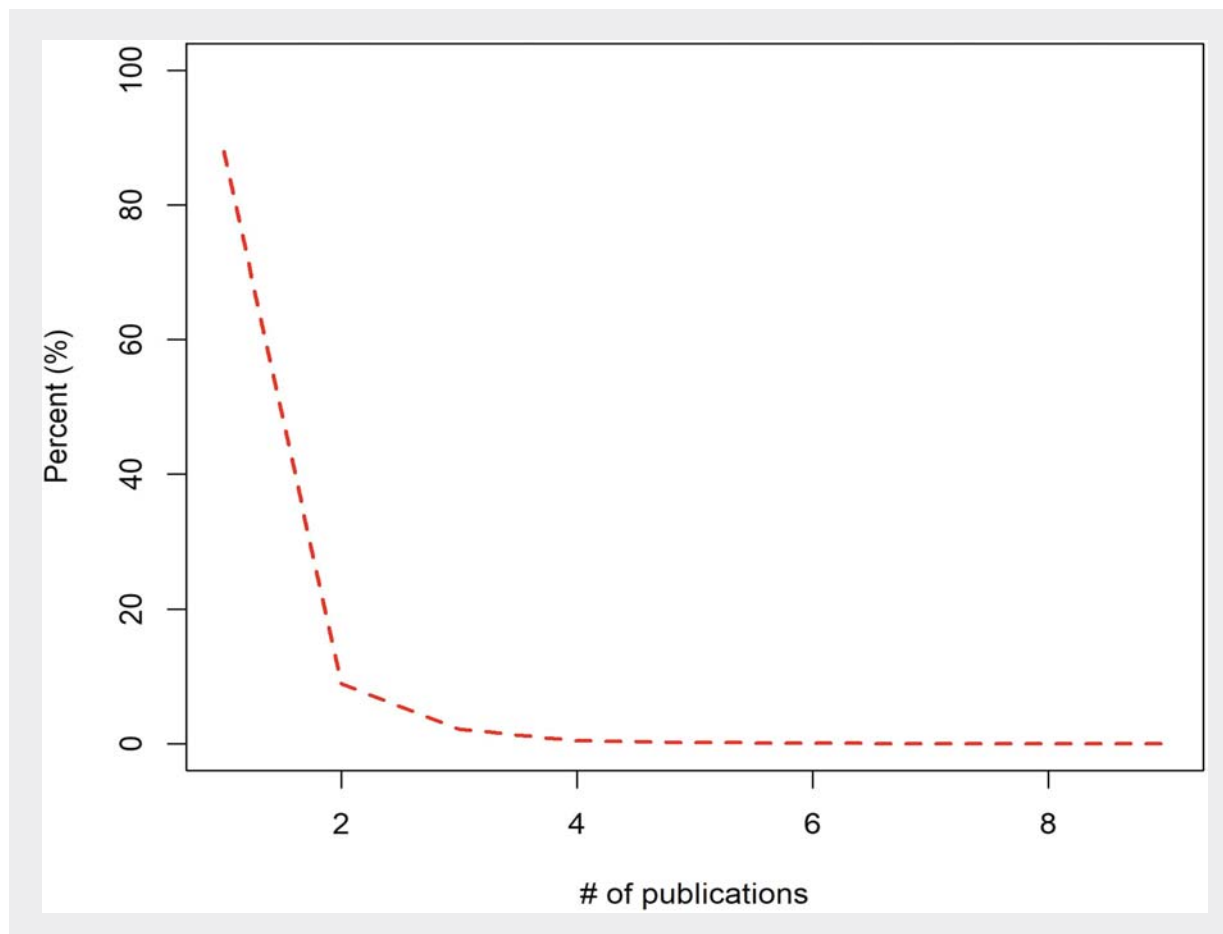


Figure 2. Proportion of first author *New England Journal of Medicine* publications.

vs. 67%; $P = 0.968$) or difference in Massachusetts-based institutional affiliation (12% vs. 4%, $P = 0.491$). Overall, female first authors appeared to be underrepresented for both SP and MP first authors (13%; $n = 36/273$).

Abstracts were reviewed to summarize each publication's findings as positive, negative, or no differences found. There was a strong trend against neutral or negative findings being reported, though MP first authors did so more often than SP first authors (27% vs. 4%; $P = 0.036$). For the subgroup of MP authors, this tendency to report neutral or negative findings more often was not unique to clinical trial-based ($P = 0.326$) or CVD-related publications ($P = 0.129$). Although not definitive, these pilot findings suggest there may be a publication bias for first-time studies reporting positive findings submitted to and/or published in NEJM; furthermore, these pilot study results appear consistent with prior findings on publication bias.⁶

Evaluation by multivariable regression analyses reconfirmed that an author publishing clinical trials (odds ratio [OR] = 6.9, 95% CI [2.2, 22.0]; $P = 0.0011$) with grant-funding (OR = 1.7, 95% CI [1.1, 2.5]; $P = 0.0085$) was

more likely to be an MP author; holding CVD-related topic, coauthor count, and collaborating author count constant.

Limitations

This NEJM-based study may be limited in generalizability. NEJM records from 2002 to 2017 were extracted because 2002 was the earliest date that first authors' first names were recorded in Medline. Further, the NEJM instructions to authors were revised on July 4, 2002. Previously, instructions stated that, "If more than 12 are listed for a multicenter trial, or more than 8 authors for a study from a single institution, each author must sign a statement attesting that he or she fulfills the authorship criteria of the Uniform Requirements. No more than 12 names will be listed under the title; other names will appear in a footnote." After July 2002, this wording was removed. Given the 2002 study start-up, it is possible that SP first author publications prior to this date may have been missed; to evaluate for a possible SP author misclassification, all SP authors were searched for any additional publications. Additionally, changes in how an author's name was published

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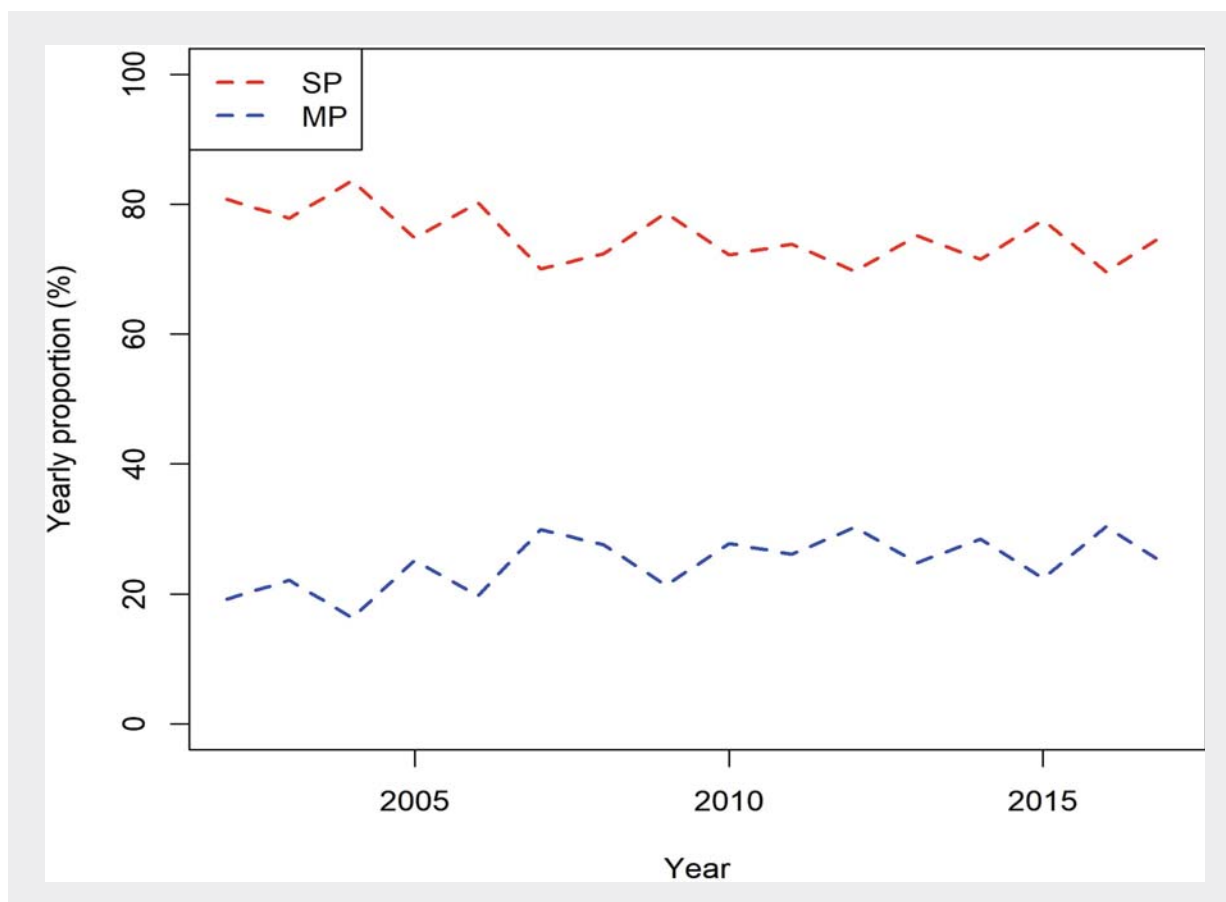


Figure 3. Proportion of *New England Journal of Medicine* single first author publication (SP) and multiple first author publications (MP) first authors over time.

(e.g., addition of middle name) impacted Medline record matches, and it is possible more than one individual with the same name may have had first author publications during the study time period. A careful re-evaluation of all SP first authors estimated the potential misclassification rate at approximately 1.1% ($n = 20/1817$). Thus, uniform adoption of author-specific identifiers such as ORCID or an author disambiguation system such as Author-ity may support future research evaluating authorship and publication patterns.^{7,8}

In the natural progression of an academic career, it is also conceivable that some authors may have had a first author publication and then had another paper published in last or senior author role. While this may be a noteworthy achievement and lead to underestimating the number of authors having a prestigious author role for multiple publications, it was beyond the scope of this investigation and thus not considered further here. However, authorship progression (i.e., first to last author position) may prove to be an interesting subject for future work in this field.

For many of the author-specific characteristics explored

(e.g., gender differences or differences in Massachusetts-based location), this study was underpowered to detect SP vs. MP first author differences. For gender-specific SP vs. MP differences, a power calculation was performed based on the results of the preliminary data extraction. This showed that, even if the supplemental data capture was performed for all study records, this study would remain underpowered (i.e., estimated power = 0.7173) to detect a SP vs. MP difference among female first authors (assuming $\alpha = 0.05$). Prior studies have similarly suggested a gender-bias for publications may exist for other medical and nonmedical scientific author populations.^{9,10} Moreover, it would not be surprising in the future to identify that a larger proportion of MP vs. SP first authors that were Massachusetts-based, as the NEJM is a publication of the Massachusetts Medical Society. These pilot study findings raised important questions as to a potential manuscript selection bias; thus, future access to internal journal editorial office databases will be required to accurately confirm or refute these preliminary findings.

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No Access to NEJM's Internal Databases

Early in the planning phase (e-mail dated November 8, 2017), the NEJM editorial office (Dr EW Campion) was sent an invitation to participate in this proposed study (including a first draft protocol); however, he declined study participation on behalf of his NEJM editorial office's team. If de-identified NEJM journal database information (e.g., describing author-specific and publication-specific characteristics) had been made available, however, a more comprehensive and timely assessment of the NEJM journal's author-specific, institution-based, and publication-based MP vs. SP comparisons could have been performed. As access to internal biomedical research journal's editorial databases is limited generally only to editorial team members, it now appears timely to initiate a dialogue among the key policy makers (e.g., Council of Science Editors or the International Committee of Medical Journal Editors) to establish new open access policies to journal-specific de-identified author and/or publication databases. Additionally, editorial offices should be encouraged to routinely report their own journal's historical author-related and publication-related characteristics associated with MP vs. SP publications, as well as comparing published author and article characteristics to their rejected articles.

Discussion

For researchers striving to publish in high impact journals, each journal's unique publication patterns should be researched to identify potential future "success strategies." For the first time, this study has identified the most important NEJM MP vs. SP first author publication-related differences by aggregating data and examining trends over time. Based on NEJM records extracted from 2002 to 2017, this study found that MP first authors were more likely to publish studies that were grant-funded, trial-related designs, and focused upon the cardiovascular field as compared to SP first authors.

Interestingly, the average coauthor counts for SP vs. MP first author publications were not different; however, coauthor counts did increase over time for both SP and MP first authors. This is consistent with prior work that found highly-productive authors frequently had papers with author counts of 10–100 authors on their curriculum vitae.¹¹ The average collaborating author counts between SP vs. MP first authors were also found to be dramatically different, further highlighting the disparity in characteristics between these two groups.

The editorial teams for NEJM and other top-tier biomedical journals should be cognizant of underrepresentation of female first authors in the scientific work as they evaluate manuscripts for potential publication. Furthermore, future research should investigate factors driving this underrepresentation and identify options to close any gender-related publication gaps.

Although the future NEJM peer-review and manuscript acceptance processes may not conform to these historical patterns, biomedical research faculty hopeful to publish multiple times in NEJM should plan to write research grants to fund large-scale, multi-center clinical trials investigating CVD-related topics with an extensive team of collaborators. New courses in clinical trial designs and management, as well as grant writing, should be offered, complemented by increased professional society networking experiences, to support biomedical research faculty aspiring to publish multiple times in high profile journals.¹² For junior faculty long-term career development planning, potential senior faculty mentors—with a strong MP track record—should be identified to provide wisdom, advice, and oversight.

Similar studies of other top-tier biomedical journals (e.g., *The Journal of the American Medical Association* and *The Lancet*) should be performed to confirm or refute the generalizability of these preliminary NEJM findings. Based on data-driven evidence, future generations of biomedical research scientists may be trained and equipped with the appropriate skills (e.g., leadership, writing, and clinical trial management training) necessary to thrive in their respective fields. Moreover, biomedical research faculty should carefully review their targeted journal's historical publication practices and authors' characteristics to develop their own academic career development strategy for future promotion and/or tenure success.

Based on documenting publication practices for a leading biomedical science journal, this study has raised several questions worthy of further investigation: Importantly, female first authors appeared to be under-represented (13%). Also, authors with an MD degree (as opposed to other doctoral degrees) comprised the vast majority of all NEJM first authors (95%); therefore, it may be more challenging for PhDs to be published as first authors in NEJM. Interestingly, a first author's Massachusetts-based location represented a potential advantage—with more than double the projected rate (11%, as compared to ~5% representing a 1/50th expected rate) for US-based authors. Manuscripts reporting positive findings (73.5%) appeared at much higher rates than anticipated; thus, it may be more challenging for articles with no differences found or negative findings to be published in NEJM.

For all submitted and published manuscripts, enhanced transparency along with public access to de-identified biomedical science journals' databases should be provided to rigorously address these scientific questions raised. Public reporting by top biomedical science journals to describe their publication policies and practices should be strongly encouraged. As the project-specific and author-based characteristics associated with major biomedical science journals' publication decisions currently remain hidden, it is now time that this historical "glass ceiling" be broken.

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As the most highly influential biomedical science journal, the NEJM was selected as the initial focus based upon the latest Journal Citation Reports' impact factor rankings. As these preliminary findings may be unique to NEJM, however, it is possible that other high impact biomedical science journals may have very different publication practices. Thus, additional bibliometric research comparing these preliminary NEJM findings across other top biomedical science journals now appears warranted.

Acknowledgments

We acknowledge the biostatistical consultation and support provided by the Biostatistical Consulting Core and the Health Science Center Reference Library staff at School of Medicine, Stony Brook University, Stony Brook, New York. Additionally, technical staff support was provided by Dr Rod Jamshidian and Ms Stella (To) Tsui.

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Out With The Old

Andrés Martin

CSE has long been instrumental in providing critical tools to new editors daunted by the tasks ahead, and in socializing them into a very special fraternity of like-minded peers. Less attention has been paid at the other end of the developmental trajectory. In this Perspective I share some of what I learned during the exit phase of my tenure as editor-in-chief.

As a child psychiatrist, I will occasionally quip with my young patients about their life choices: "Out of all the parents out there in the world, you made an excellent choice by selecting the ones you did: well done!" The approach is certainly not fit for every child, but can at times be disarmingly engaging and set off an interview on a positive and shared track. None of us, of course, have any say in the parents we get. And yet, those of us who are parents know that our children have, in many ways, made us who we are; we would be quite different caregivers, and people in general, were it not for their influence. Our children may not select us, but they certainly mold us.

I found myself coming back to these generational musings as I neared the end of my decade-long tenure as Editor-in-Chief of the *Journal of the American Academy of Child and Adolescent Psychiatry*. Just as I did not choose my parents, I had no say in who my editorial successor would be. Still, I felt like congratulating myself on an inspired decision I had absolutely no say in. I suspect there may be ways in which some of my actions have helped other candidates and stakeholders get there—I would like to believe that there are things that we can do as editors to optimize our succession prospects. Even if there are not, and even if we fail at securing our wished-for successors, there are certainly ways to ensure a smooth and seamless passing of the baton. To that end, I share some of my suggestions for outgoing editors.

Start Early: Prioritize Strategy over Chance

Upon becoming Editor-Elect in 2006, I immediately began worrying about the end of my term, 11-½ years hence. Neurotic and anxious, you say? Guilty as charged. But my worry was not without cause. It seemed to me then that I had been selected in a fairly random way; not that I wasn't qualified or appropriate, but that the process had



relied more on chance than on deliberate planning. I was committed to shifting that balance.

Succession planning became not only my first strategic priority, it became an obsession of sorts. The pleasures of being an editor are in no small measure related to the time-limited nature of the position (I feel for you, ye stagnant editors-for-life). I knew that having a systematic and organized approach to identifying and cultivating editorial talent from the start would be key to whatever my success or failure as an editor might be. To this end, I pursued several initiatives: 1) an endowed position for an Assistant Editor-in-Residence, to give sustained, in-depth editorial experience and mentorship to an early-career child and adolescent psychiatrist; 2) a program for early-career contributing editors that included elements of mentorship, skills development, and active participation in the development of key journal products; 3) a meritocratic and heterogeneous editorial board that plumbed the depth and breadth of editorial experience in the field and brought diverse skills and perspectives to the masthead; and 4) a group of senior handling editors who took on increased responsibility within the peer review process, served as advisors and ambassadors, and complemented and rounded out my own skill set (i.e., my many shortcomings).

DR MARTIN was Editor-in-Chief of the *Journal of the Academy of Child and Adolescent Psychiatry* until his ten-year term ended on December 31, 2017. He is the Riva Ariella Ritvo Professor at the Child Study Center, Yale School of Medicine.

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Over the years, this four-pronged approach enriched our talent pool and added rungs to the ladder of upward mobility. A decade later, it was gratifying and not at all fortuitous to see a new masthead resplendent with names I knew so well and had respected for so long—individuals who rose through the ranks. Mind you, their appointments were not my doing; their actions and their work (and yes, their manuscript-handling statistics) spoke on their behalf more loudly than I ever could.

Embed Yourself in Experience: Never Worry Alone

Editors are made, not born. Even as I was developing new opportunities to help make the editors of the future, I too needed to secure mentorship and guidance for myself. This meant articulating, championing, embodying, and hoping to emulate a role model altogether new to me:

I stumbled into editing, but my hope is that others may gravitate towards it in a more directed and deliberate way, and even that some of my younger peers may in fact wish to grow up to become editors. As a field, we have been successful in developing clinician-educators and clinician-scientists. It is my fervent hope that we may be well on our way to doing as much for a new phenotype of clinician-editors. It is an affiliation I am proud to call my own. Good scientific editing is a public service, and as such, a priority we are obligated to nurture in coming generations.¹

I assumed I would learn editing on the job, as I have learned so much else in life. Little did I know that not only can one learn a key set of editorial skills, but that one can go to editor school. Thank you, Council of Science Editors (CSE), for your Short Course for Journal Editors and thank you for providing a guide to us, the formerly perplexed and bewildered. The short course served me well, as has my decade-long affiliation with CSE and the many generous colleagues I have met through the Council. I understand that CSE is planning to expand its resources for journal editors, offering educational opportunities in new, accessible formats and locations. I applaud these efforts and am pleased to know that future generations of editors will benefit from an even greater host of supportive resources and benchmarks.

As a clinician-educator I make a point of teaching my trainees "Rule #1": *Never Worry Alone*. CSE provided me with a forum for never having to worry alone as an editor, and for that I am most grateful.

Part of setting the right conditions on my way out was to ensure that my successors were acquainted and familiar with CSE in a way I had not been at their stage. It was one of my ways of "paying it forward." The *Journal's* Assistant Editors-in-Residence continue to attend CSE's annual meeting once during their 2-year terms as part of their mentored exposure

to scholarly publishing, and my successor attended his first CSE meeting in May 2017. (*Disclosure: even beyond "acquainted and familiar" there is "immersed."* It has been a high point to see Mary Billingsley, ELS, my dear Managing Editor, rise from bright-eyed-and-bushtailed first-time CSE attendee to Vice President of the organization. Read on for a definition of BIRGing.)

Overlap Generously: Make Sure You Do

A lengthy period of overlap between Editor-in-Chief and Editor-Elect was a true gift from our parent organization (whose absolute respect for editorial independence I must pause to salute). A full 18 months between the selection of the Editor-Elect and the end of my term provided ample time for collaborative planning and implementation; for the outgoing and incoming editorial teams to wind-down and gear-up, respectively, in measured, deliberate steps; for the institutional memory of the *Journal* to be passed on; for its pipelines and procedures to remain robust; and yes, even for some inevitable mourning and grief to take place.

Such a smooth transition would not have been possible were it not for the fact that our editorial office remained a constant. This had not always been so. Indeed, my second strategic priority upon being selected in 2006 was to ensure our office would no longer wander, changing homes every decade as it had before, but instead be permanently housed at the Academy's headquarters in Washington, DC. In retrospect, this was a natural evolution made possible by (then) relatively new electronic resources and opportunities. I do realize that I was blessed with a peerless editorial office team; for less fortunate editors, finding new staff may be the right solution, further making the case for a long period of overlap between teams.

Our stable and well-established editorial office ensured that the trains kept running on time, permitted the new editor full devotion to the work at hand, rather than to laying new tracks, staffing up, and training a fresh team. The office's close proximity to our parent organization and leadership provided another layer of support through established relationships and lines of communication. This outgoing editor in turn could rest assured that the same capable and responsible hands continued to lovingly care for the pages left behind.

Retire Gracefully: Don't Overstay Your Welcome

The overlap is a period of transition. On your way out, be grateful for the privileged role with which you have been entrusted. Take stock of what your tenure has yielded. Feel proud, be content and satisfied.

But you do have a few remaining tasks. Clean your desk, be it real or virtual, and leave it tidy and ready for your successor. Make yourself available, but not on your

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terms—always on your successor's. Make sure they know that. It is a way of helping them take charge, of trusting them, and of letting them practice how to get help when they need it.

There is life after editing. Some will be keen to move on, while others may need a gentle nudge to depart, but depart we all must. Enjoy your emeritus status: you've earned it.

Experience the Awe: Bask in Reflected Glory

If you have planted your garden well, your harvest will be abundant. As I prepared to move on, I felt elated and fulfilled, not so much by the impact factor (healthy as it was), by the many doors that editing opened, or by the intellectual rewards I reaped; rather, it was by seeing how a discipline dedicated to easing the suffering of children continues to evolve and mature, and by witnessing the blossoming of so much human talent and commitment in our academic journal.

Our trustworthy friends at Wikipedia define the classic social psychology verb (née concept) of BIRGing (Basking In Reflected Glory) as

*a self-serving cognition whereby an individual associates [him/her]self with known successful others, such that the winner's success becomes the individual's own accomplishment. The affiliation of another's success is enough to stimulate self-glory.*²

For the past two years, I have proudly cheered from the stands as my successor and good friend Doug Novins took on this labor of love. Mary Billingsley kept the trains running on time. And I have BIRGed away over the two of them, their fabulous new team, and our beloved *Journal* as I have settled into a new chapter of my life.

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The Editor

The editor stood fore (sic) the heavenly gate,
his features pinched and cold.
He bowed before the man of fate,
seeking admission to the fold.
"What have you done" St. Peter asked,
"to gain admission here?"
"I was the journal's editor, sir,
for many a weary year."
The pearly gates swung open wide
as Peter pressed the bell.
"Come in and choose your harp." he cried.
"You've had your share of hell!"

----Anonymous

(submitted by Barbara Meyers Ford)

The Epicene Solution

Stacy L Christiansen

Once upon a time, in formal writing pronouns were expected to behave in strict accordance with their antecedents: “The patient should pick up his prescription.” “The surgeon completed her training.” “Everyone should complete his or her form.”

But what if you didn’t know if the patient was male or female? What if the surgeon preferred a nonbinary pronoun? And what about the clunky “his or her” construction (not to mention the impossibly awkward “s/he”) when an indefinite pronoun is the subject (“anyone,” “everyone,” “someone,” and the like)?

One solution, no longer viable, was to select a catchall gendered pronoun—usually the generic “he”—to stand in for all individuals regardless of their actual gender or pronoun preference. This approach to the need for a third-person singular pronoun has largely been discarded as sexist language (and in many cases just flat-out wrong): “Each patient needs to get regular checkups, including visits to his primary care physician and gynecologist.”

Sometimes it’s simple enough to reword a sentence by using the plural without affecting the meaning: “A researcher should cite her sources” could become “Researchers should cite their sources.”

However, rewriting is not always possible or desirable, and performing linguistic acrobatics just to avoid violating a grammar rule can be time-consuming and lead to unclear or awkward prose.

Enter “they.”

Because the English language does not have a gender-neutral third-person singular pronoun readily available, speakers and writers have often turned to the handy “they” to fill this need. “They” is a good solution because it’s a familiar (not newly coined) word, it’s short, and it’s inclusive of all people, which helps writers avoid making assumptions about gender. In this manner, it’s considered an epicene pronoun (according to Merriam-Webster’s, “having but one form to indicate either sex”).

In addition, “they” can be useful in articles in which a person’s identifiability is a concern (eg, in case reports in medical journals or in news stories): “One of the patients in the waiting room reported that they had used illicit substances.”

Nearly all of the major stylebooks and many authoritative language sources now allow or even encourage the use of what’s often called the “singular they”: the newly published 11th edition of the *AMA Manual of Style*,¹ *Chicago Manual of Style*,² *APA Publication Manual*,³ *AP Stylebook*,⁴ and



*Merriam-Webster’s*⁵ dictionary (whose editors selected it as “Word of the Year”⁶ for 2019).

Yet the singular “they” is hardly new. Some sources have traced its use back as far as Middle English. Beloved authors have used it, such as Jane Austen: “But to expose the former faults of any person, without knowing what their present feelings were, seemed unjustifiable” (*Pride and Prejudice*). It also turns up in darker places: “But it was Jonathan, and he was my husband, and we didn’t know anybody who saw us, and we didn’t care if they did, so on we walked” (Bram Stoker, *Dracula*). The singular “they” even appears in the *Declaration of Helsinki*: “The physician must fully inform the patient which aspects of their care are related to the research.”

So exactly how is the singular “they” used? When functioning as a singular pronoun it should still take a plural verb. This isn’t revolutionary—we treat singular “you” the same way: “You are a good writer” not “You is a good writer.” When used as a subject, it’s “they.” When functioning as an object, it’s “them”: “Every patient had the informed consent passage read to them.” As a possessive pronoun, it’s “their”: “Every author needs to submit their authorship form.” And as to the reflexive form, “themselves” is currently the most common usage: “The patient hurt themselves.”

Some writers and editors may balk at this construction because formal grammar education teaches that pronoun agreement (matching on number, person, and gender) is essential to correct grammar. But language is nothing if not ever changing to reflect the world in which it is used, and “they” is here to stay.

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Social Media in the Professional Workplace: Yea or Nay?

Jennifer Regala

Social media has become an integral part of our day-to-day lives. From the early days of chat rooms, MySpace, Friendster, and AOL Instant Messenger, to the countless modern apps such as Facebook, Twitter, and Instagram available today, social media has evolved from a basic way to chat with others of similar interests into a viable and effective tool to enhance communication at a professional level. This column will address social media and its use in scholarly publishing, starting with this first column, which will examine whether you and/or your organization want to amplify your group's messages with one or more of today's sophisticated social media tools.

The first thing you should know about me is that I love my job. As the Managing Editor of *The Plant Cell* and *Plant Physiology* at the American Society of Plant Biologists (ASPB), I love every single thing about my role: overseeing production and peer review, working closely with our extremely capable vendors, figuring out tricky style questions, facilitating the day-to-day operations of our editorial boards, and so much more. However, there has been an unexpectedly delightful and rewarding aspect of my job that has become a passion of mine: social media and using it to promote our authors, our editors, our society, and the plant biology community. Also, social media has played a crucial role in building relationships with my scholarly publishing peers. The ways I use social media professionally continue to evolve and expand in ways I could never have envisioned when I first started here at ASPB. I could go on and on about how vital social media can be to an organization if it is used well. That's how I found myself raising my hand high in the air when Editor-in-Chief Jonathan Schultz asked for volunteers to write a column for *Science Editor*. I hope to use this space to start a discussion with all of you about how to use social media effectively to educate, include, connect, promote, and so much more.

The ways I use social media professionally continue to evolve and expand in ways I could never have envisioned when I first started.

JENNIFER REGALA is Managing Editor at the American Society of Plant Biologists.



At this point in time, I imagine that most of you have at least dabbled in social media. In my case, I got hooked on Twitter when my youngest son was born. He had some health issues his first year of life (he's now 10 years old and doing well, thankfully), and because I couldn't get out of the house much, I turned to an online community of parents for support. Although I never met any of these individuals, they were friends who could share advice and more, and they lived very conveniently inside of my phone. Now, I love Snapchat and Instagram to connect with my kids, my family, and to follow special interests of my own.

I refer to these personal experiences to bring us back to the topic of how to use social media professionally. Which tools do you feel most comfortable with? If you're not using social media professionally, the first thought you need to have is: "Should I be using it for work?" Maybe your organization does not support its use for work purposes. I know that in the past, I have worked for organizations that did not allow the sharing of any information via social media channels. Or perhaps social media use is allowed, but your messages are limited in certain ways. It is critical that you work with your leadership and your team to understand what is appropriate to share on social media. Those considerations aren't your only ones. What should you write in your social media profiles? What about your social media handles? Does someone in your organization need to review those items?

Also, you need to think about whether you want to have personal yet professional social media handles. Maybe you want to encourage your organization to start professional

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handles to represent your organization. I will use my work situation as an example. I tweet from my own personal, yet professional, Twitter handle, @JRegala_ASPB, but I also work on ASPB's internal social media team to amplify our journals' messages via @PlantPhysiol, @ThePlantCell, and @PlantDirectJ; our organization's messages via @ASPB; and our digital ecosystem's messages via @Plantae_org. I also work with that same team on ASPB's Pinterest, LinkedIn, and Instagram messaging strategies. Your organization might have social media guidelines, and you will want to follow those carefully. Another roadblock for you might be that your organization does not permit the use of the organization's name in your user handle. Make sure you are extremely familiar with all social media policies before you get started.

If your organization is supportive of social media use, your next question should be: "What are my messages?" Who, exactly, will you be trying to reach? In my case, I use my professional social media presence to connect with two important constituencies: the plant biology community (with a particular emphasis on editors and authors, because they are my customers and those I most want to hear from) and my scholarly publishing network (to connect with others with similar career questions and needs, to promote various volunteer engagements I participate in, and to get ideas from others about how to best serve the first community I mentioned).

Over the next several issues, it is my goal to continue the discussion I've started in this column. I have ideas and

plans for multiple future columns. I will focus on which social media outlets are best depending on what kind of user you are. Are your communities chatting up a storm on Twitter? Are many of them on LinkedIn? Do you have lots of beautiful images begging to be shared on Instagram? And then there's Facebook, TikTok, Snapchat: The possibilities are endless, and we will talk about as many of these choices as we can. What are common mistakes made by experienced and inexperienced users alike? What are the best practical uses of social media? How can you analyze your social media use to determine whether your efforts are truly working? What does it mean to "live tweet" an event, and how can you do it well and responsibly? What types of permissions do you need to post pictures or other personal information of those you feature on your social media? What's the difference between a personal professional handle and an organizational handle? And so much more...

This column wouldn't be truly interactive, however, if I didn't offer you all the chance to dialogue in real time. I encourage you to find me on Twitter, @JRegala_ASPB, to offer suggestions for column topics and to share your own favorite social media tips with me. If you don't have Twitter (yet!), contact me the old-fashioned way: JRegala@ASPB.org. I'm excited to engage with as many of you as possible and look forward to saying hi to you from this space for as long as you will have me.

(Re)Introducing Ethical Editor

Kelly A Hadsell

Ensuring that the publication of manuscripts in the sciences meets the highest ethical standards is paramount in upholding the tenants of scholarly publishing. Ethical standards help to ensure that published research is reliable, reproducible, and conducted without any conflict of interest. Recent media stories have brought to light instances where the highest ethical standards were not maintained.^{1,2} While advances in forensic tools (such as plagiarism detection software), an environment of growing awareness, and stronger book and journal ethics policies have been helpful in catching some violations prior to publication, it remains imperative that editors and editorial offices have resources to consult in order to help them navigate these often complicated issues in a fair and consistent manner.

The CSE Editorial Policy Committee (EPC) serves as a resource regarding editorial and publishing policies as they apply to publications in the sciences. The EPC meets monthly and studies and analyzes procedural, ethical, legal, and economic policies and recommends policies and/or guidelines that relate to the editing, review, and publication of manuscripts in books and journals in the sciences. The EPC may also suggest policies to the CSE Board of Directors that affect CSE's own publications. Policy guidelines developed by the EPC are presented to the CSE membership via many vehicles including the White Paper on Promoting Integrity in Scientific Journal Publications, online resources including a retraction resource and sample correspondence for editorial offices managing ethical issues, publication in *Science Editor*, and presentation at CSE annual meetings. After appropriate revision in consultation with the Board, the policy guidelines may be published and disseminated by CSE through the Publications, Education, Membership, and Program Committees. More information about the EPC's mission is available on the CSE website⁴ and some initiatives undertaken by the EPC in recent years are shown in the Table.

Table. Recent CSE Editorial Policy Committee Initiatives.

Date	Initiative
Spring 2020	White Paper updates to Roles and Responsibilities in Publishing section
April 2020	Updates to Retraction Resource
January 2019	<i>Science Editor</i> Commentary on White Paper update regarding preprint servers
May 2018	Whiter Paper updates to address editorial board participation, preprint servers, and publication oversight committees
October 2017	Prepared rules of etiquette for CSE Listserv

As the Chairperson of the EPC, I am pleased to announce that this column is the first of a newly relaunched *Science Editor* column on publication ethics entitled "Ethical Editor." The EPC is honored to have been asked to contribute to *Science Editor* on an ongoing basis. We will use this vehicle to not only update the membership on the EPC's activities, including White Paper updates and why they are important to the field, but also to serve the CSE membership in a larger capacity by writing about topics of specific interest to the membership. Is there a particular issue you would like to learn more about? Let the EPC know by contacting me at Kelly.hadsell@kwfco.com.

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KELLY A HADSELL is Editorial Director, KWF Editorial.

Gatherings of an Infovore*: Who Deserves CRediT?

Barbara Meyers Ford

CRT = Contributor Roles Taxonomy

The need for a way to define how an individual participated during a project and the record of that project's results is a relatively recent discussion among the research and publishing communities. For hundreds of years, authors of journal articles were listed in the order dictated by the publication. In the early years of science, first authors in a list could be the lead researcher, principal investigator, department head, or some other supervisory role depending on the style of the journal. As the number of members in a project team increased in certain disciplines, the first author could be the corresponding author (the person responsible for submitting the paper, available for requests on the review and publishing processes, and dealing with any queries subsequent to publication), and the last author might be the overall supervisor of the project.

But no matter the order, exactly what an individual did for the project (before, during, or after) wasn't apparent in the author list, or seldom anywhere else in the article. By the start of the 21st century, stakeholders desiring increased transparency and accessibility of reported results—researchers, funding agencies, academic institutions, editors, and publishers—came to recognize the usefulness of a taxonomic approach. According to the Consortia Advancing Standards in Research Administration Information (CASRAI) project website “[i]n mid-2012 the Wellcome Trust and Harvard University co-hosted a workshop to bring together members of the academic, publishing, and funder communities interested in exploring alternative contributorship and attribution models.” In brief, the roles are intended to provide greater recognition for the work of each author, reduce authorship disputes, facilitate collaboration, and yield a metric for funders and other institutions regarding the output resulting from their support.

The product from the group was the structured Contributor Role Taxonomy introduced in 2014 with the moniker CRediT. Adoption was not instantaneous but fairly



rapid by our industry's standards. With the advent of 2020, a number of major publishers in Canada, the UK, Europe, and the US have adopted CRediT.

CRediT is a high-level taxonomy with the following 14 defined contributor roles:

- Conceptualization
- Data curation
- Formal analysis
- Investigation
- Methodology
- Project administration
- Resources
- Software
- Supervision
- Validation
- Visualization
- Writing—original draft
- Writing—review and editing

A definition for each role can be found on the CASRAI website at <https://casrai.org/credit/>.

Currently CASRAI manages CRediT as an informal standard but work is underway to have it become a formal standard at the National Information Standards Organization (NISO).

As publishers look to adopt this new authorship standard as a means to provide their communities with increased transparency to the research results they disseminate below are some resources which may prove useful in making that decision.

Naturally, the first source to seek out is the CASRAI website and the organization's blog and list of resources: <https://casrai.org/blog/> <https://casrai.org/resources/>

Various publishers have made available easily understandable and accessible documents for authors to use in adhering to the taxonomy, such as those from Cell Press and Wiley:

*A person who indulges in and desires information gathering and interpretation. The term was introduced in 2006 by neuroscientists Irving Biederman and Edward Vessel.

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<http://www.cell.com/pb/assets/raw/shared/guidelines/CRediT-taxonomy.pdf>

<https://authorservices.wiley.com/author-resources/Journal-Authors/open-access/credit.html>

Articles by authors and publishers offer interesting insights into how the various communities are reacting to this new approach for giving CRediT. Below is a sampling.

CRediT Check: Should we welcome tools to differentiate the contributions made to academic papers?
 “Elsevier is the latest in a lengthening list of publishers to announce their adoption for 1,200 journals of the CASRAI Contributor Role Taxonomy (CRediT). Authors of papers in these journals will be required to define their contributions in relation to a predefined taxonomy of 14 roles. In this post, Elizabeth Gadd weighs the pros and cons of defining contributorship in a more prescriptive fashion and asks whether there is a risk of incentivising new kinds of competitive behaviour and forms of evaluation that doesn’t benefit researchers.”

<https://blogs.lse.ac.uk/impactofsocialsciences/2020/01/20/credit-check-should-we-welcome-tools-to-differentiate-the-contributions-made-to-academic-papers/>

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Farewell authors, hello contributors

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No more first authors, no more last authors

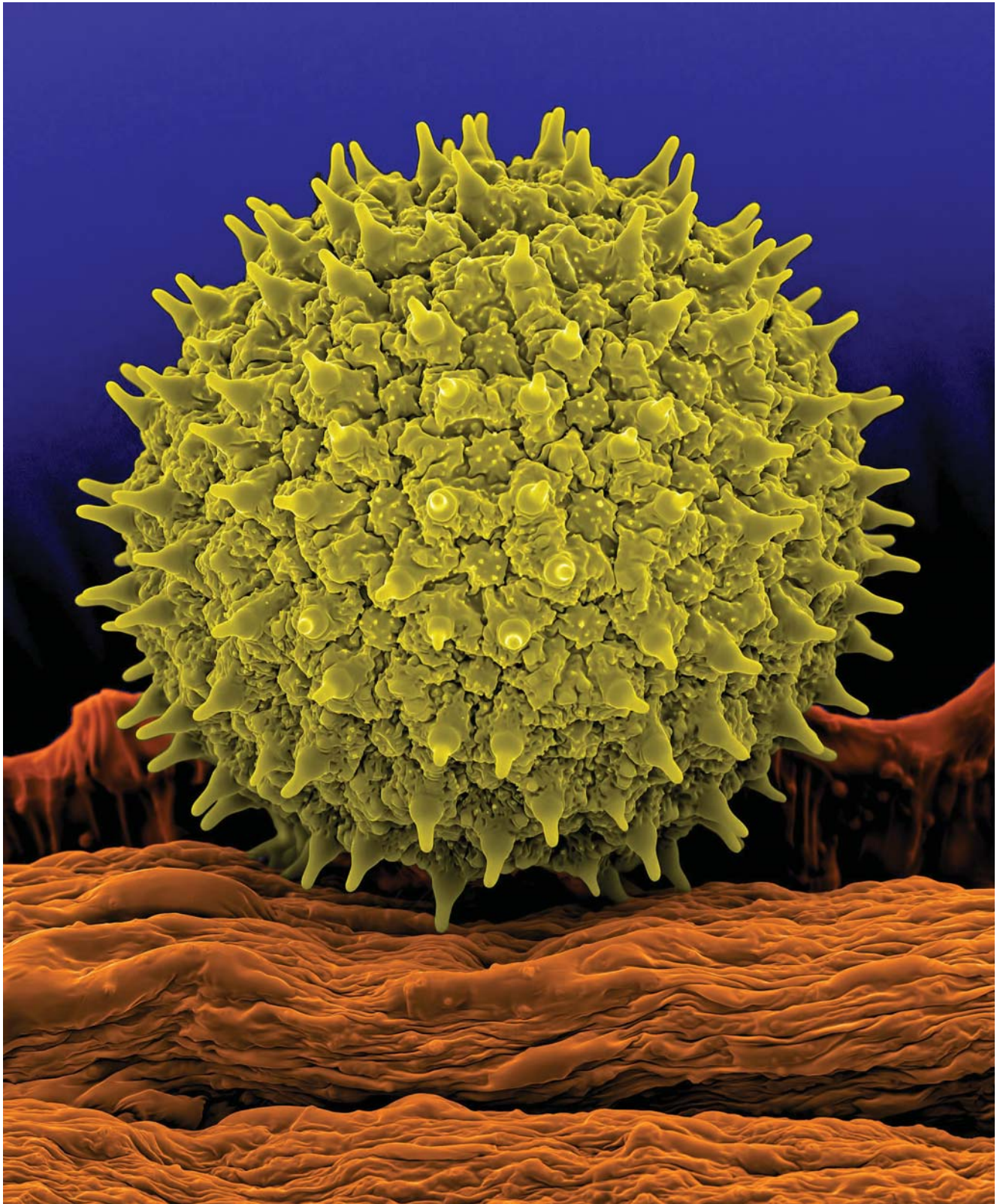
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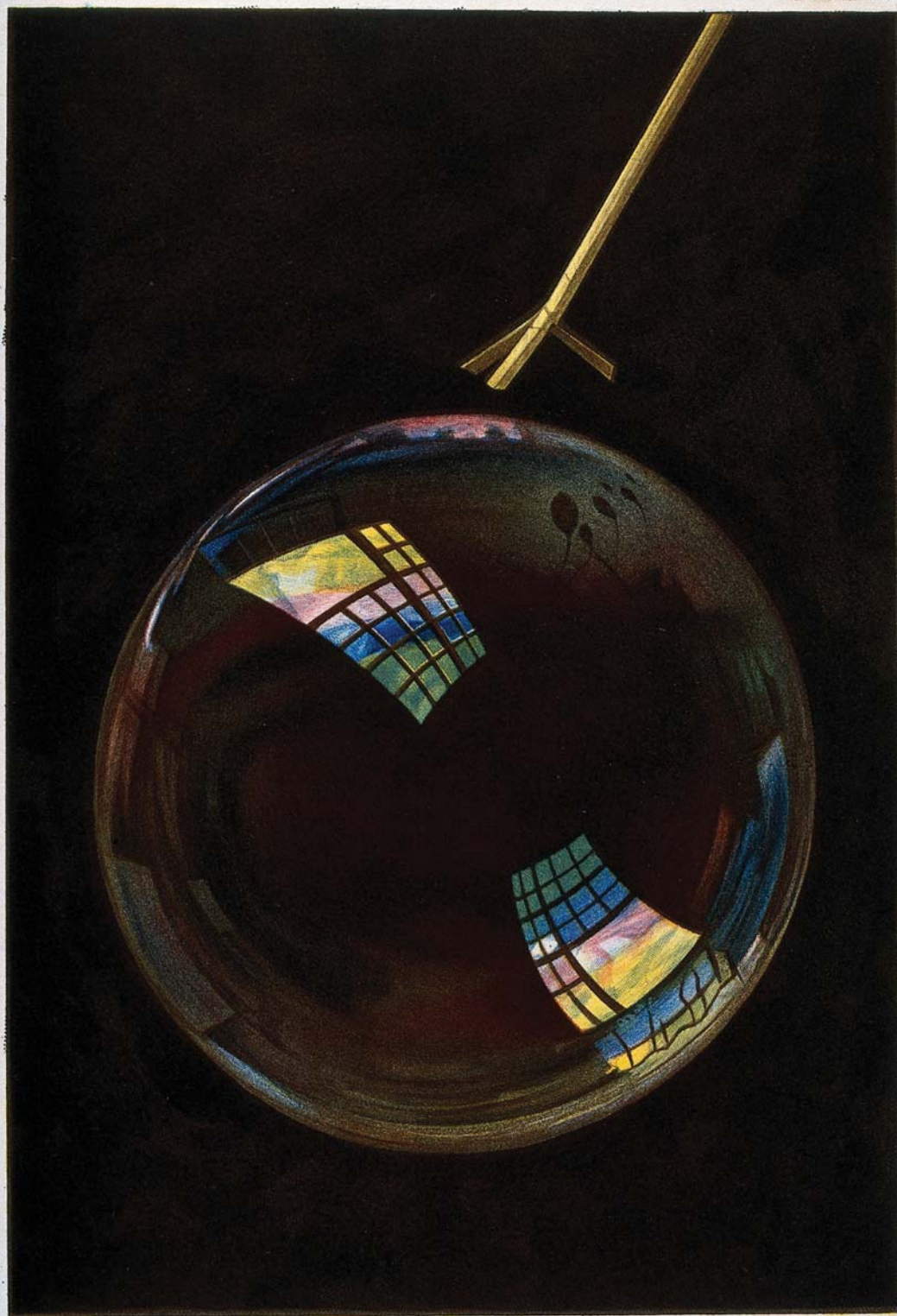
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Scanning electron micrograph (SEM) of a single common morning glory (*Ipomoea purpurea*) pollen grain, still sitting on the anther. Plants in the genus *Ipomoea* are annual climbers with heart shaped leaves and trumpet-like flowers. Magnification 600x. Credit: Stefan Eberhard (CC BY-NC 4.0) <https://wellcomecollection.org/works/unhshq7e>



B. Desgoffe pinx.

M. Rapine sc.

Optics: a soap bubble exhibiting interference colours. Coloured mezzotint [?] by M. Rapine, c. 1883, after B. Desgoffe. Credit: Wellcome Collection (CC BY 4.0) <https://wellcomecollection.org/works/fxw4nqxe>