Chapter 8
Picking the Right Journal

A simmering question facing the scientist or engineer thinking about publishing a peer-reviewed paper is which journal to submit to. Hopefully, the question (and possibly its answer) is in the mind of the researcher from the beginning. Often, it is a last-minute choice after the paper is mostly or completely written. What factors should lead to a decision as to the most appropriate publication venue for your work? Historically, journal selection has involved relevance, acceptance rate, circulation, prestige, and publication time.[1] But as more journals have moved online, and search engines have made finding and accessing articles much easier, some of these factors are less relevant today.

8.1 The Specialization Spectrum

The first scientific journal was published over 350 years ago.[2] The *Philosophical Transactions of the Royal Society* was a general journal of "natural philosophy" (as science was then called), and for over 100 years all regularly published journals were also similarly general. After all, there was no real specialization in science or scientists and so no need for specialized journals. The birth of chemistry as a modern scientific discipline changed that. Largely through the efforts of French scientist Antoine Lavoisier and colleagues, the "chemical revolution" of the late 18th century helped make chemistry a quantitative science involving the combination of elements into molecules. In 1789, they started the first permanent specialty science journal, *Annales de Chimie*.

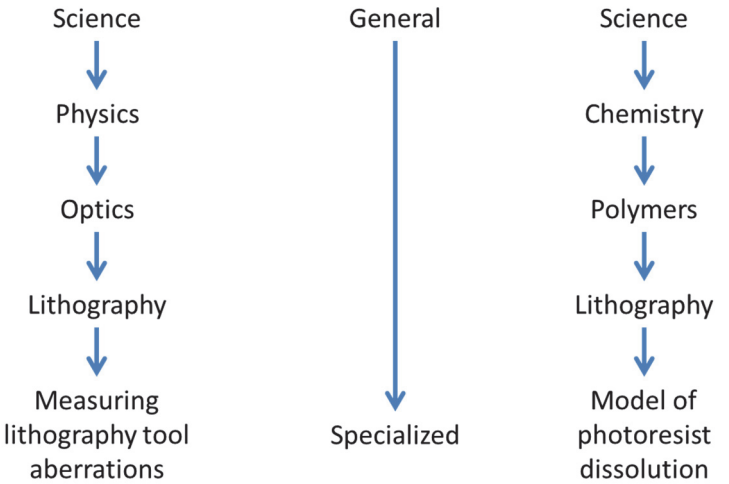
Since then, the growth of science has led inexorably to a growth in specialization, both in scientific disciplines and the journals that serve them. Today, there are about 30,000 peer-reviewed journals publishing more than 2 million articles a year.[3] These journals run from the perfectly general to the highly specialized, but the vast majority of science journals today are specialized in narrow fields. The first decision facing prospective authors is where on the specialization spectrum they should try to publish.

Most science paper topics can fit well anywhere along a spectrum from the general to the specialized. To make this idea clear, I will fabricate a couple of example papers that could easily be published in the *Journal of Micro/Nanolithography, MEMS, and MOEMS* (JM^3). Suppose a paper was on the

topic of measuring aberrations in an optical lithography tool. Such a paper would have a natural home in JM^3, finding a large audience of lithographers interested in that topic. If, however, the measurement technique was applicable to lenses in general, not just lithographic lenses, the paper might be of interest to wider audience of optical scientists and engineers. Maybe a better home for such a paper would be a more general optics journal (SPIE's *Optical Engineering* comes to mind). But what if the measurement revealed a more subtle property of light with implications beyond lenses and aberrations? Could the paper be of interest to a more general audience of physicists? Or even to scientists in general?

The preceding questions address the specialization spectrum of science journals. As the following diagram illustrates for two example topics, almost any given subject can fit in many places along the specialization spectrum. At the top (most general) are the interdisciplinary science magazines, with famous journals like *Science* and *Nature* attempting to publish significant and timely research of wide interest. One step below are the general scientific disciplines such as physics, biology, chemistry, etc. They each have journals devoted broadly to those topics. The divisions to further subtopics can have multiple levels, depending on the size of the field. At the bottom are the most specialized fields, where further specialization is not practical due to the diminishing number of practitioners.

The key to deciding where to publish along the specialization spectrum is picking the target audience. Moving down the spectrum towards greater specialization will, in general, reduce the size of the overall audience but increase the interest match of the readers that remain. A large fraction of the readers of JM^3 could be interested in a paper on photoresist dissolution, for example. What fraction of the readership of a polymer science journal would have a similar interest? Even more importantly, there may only be a very small overlap between the readership of the more- and less-specialized journals along the spectrum.



Which readership would you rather reach: the photoresist users and chemists working in the field of lithography, or the more general polymer scientists working on a broader range of polymer topics?

There is no right answer to these questions because they depend specifically on the paper and the goals of the author. However, one thing is clear: moving up or down the specialization spectrum is not inherently better or worse. There is no doubt that the best general-science journals have higher levels of prestige, often associated with a higher journal impact factor. For many, prestige and peer recognition are prime motivations for publishing a paper. This thinking gives rise to what I consider to be a fallacious approach to picking a journal: send your manuscript to the one with the highest impact factor that you think may accept it. Often, this means moving as general in the specialization spectrum as your topic might allow.

The problem with this approach should be obvious: in the pursuit of a prestigious home for your paper, you may miss the audience you most want to reach. I think it is fair to say that there are many regular readers of a specialized journal who never pay attention to what is published in the more "prestigious" general-science journals. If reaching those specialized readers will cause your work to have greater impact on the community you hope to reach, then the specialized journal is probably the right place for your paper. Of course, the same can be said for any journal anywhere along the specialization spectrum. To achieve impact (rather than just impact factor), you must best match your ideal audience with a journal's actual audience.

8.2 Reading in the Age of Search Engines

Critics of this audience-match approach to finding the best journal for a paper often point out that, in the age of Internet search engines, any reader can find any paper on any topic regardless of where it is published. And if this is true, why not use the somewhat vain criterion of prestige (and its proxy, impact factor) as the major factor for deciding where to publish?

Although there is some degree of truth in this position, I have a two-part response. First, search engines such as Google Scholar or DeepDyve, as powerful as they are, still tend to be blunt instruments when it comes to matching interested readers to the right papers. When a search provides me with a thousand hits in 0.13 seconds, I am often forced to manually filter results. And my first filter is, I think, quite common: Has the paper been published in a journal I recognize, one that I have already judged by reputation or past personal experience? With a few exceptions (famous journals like *Nature* or *Physical Review*), I know nothing about the impact factors of the journals I read. Instead, I know something about whether past pursuits of specific topics have profitably led me to those journals. For some topics, I may even go straight to the specialty journal I know first to do the search, knowing that my productive hit rate there is likely to be much higher than a general search.

Second, the match of journal scope to paper topic does more than make searches for papers more effective, it makes the publishing of those paper more

effective as well. After all, what makes peer review a value-added publishing process is the editorial peer review itself. Editors evaluate submissions, find reviewers, and then weigh reviews to both select papers for publication and improve those papers that are selected (see Chapter 10). The outcome of that process is a collection of published papers far improved from the collection that was originally submitted. But for this process to work as designed, the editors and reviewers must be properly matched to the topics of the submitted paper so that the label "peer" is in fact appropriate. And because editors and the reviewers they select are almost always found in the target audience for that journal, finding the best audience match for your manuscript will usually result in the best editorial process, the most appropriate reviews, and the most improvement in your paper.

8.3 Avoiding the Wrong Journal

Unfortunately, the open-access movement in publishing (where authors pay for publication and readers can access the papers for free) has given rise to an ugly phenomenon: the predatory journal. These are sham scientific journals that pretend to be serving the needs of the scientific community but in fact are only about making money. Despite a legitimate-looking website and a reasonable-sounding name, these journals are not the real thing. They are rarely, if ever, read, will accept any paper submitted after a phony peer review, and then take the authors' money to put their paper up on a website. To publish a paper in a predatory journal is worse than a waste of money, it is a blot on the author's career and a detriment to science.

To avoid predatory journals, here is a list of questions to ask before submitting an article to a journal that you are not familiar with (adapted from the thinkchecksubmit.org website):

- Do you or your colleagues know the journal?
  - Have you read any articles in the journal before?
  - Is it easy to discover the latest papers in the journal?
- Can you easily identify and contact the publisher?
  - Is the publisher name clearly displayed on the journal website?
  - Can you contact the publisher by telephone, email, and post?
- Is the journal clear about the type of peer review it uses?
- Are articles indexed in services that you use?
- Is it clear what fees will be charged?
  - Does the journal site explain what these fees are for and when they will be charged?
- Do you recognize the editorial board?
  - Have you heard of the editorial board members?

  - Do the editorial board members mention the journal on their own websites? (Sometimes people are listed as editorial board members without their permission.)
- Is the publisher a member of a recognized industry initiative?
  - Do they belong to the Committee on Publication Ethics (COPE)?
  - If the journal is open access, is it listed in the Directory of Open Access Journals (DOAJ)?
  - If the journal is open access, does the publisher belong to the Open Access Scholarly Publishers' Association (OASPA)?
  - Is the journal hosted on one of INASP's Journals Online platforms (for journals published in Bangladesh, Nepal, Sri Lanka, Central America and Mongolia) or on African Journals Online (AJOL, for African journals)?
  - Is the publisher a member of another trade association?

Be careful of the growing number of predatory journals and avoid adding to their plague on science.

8.4 Conclusions

In summary, picking a journal to submit a manuscript for publication is a very important decision, one that deserves careful consideration. The best decision process involves two steps:

- What is the ideal audience for your paper?
- Which journal has a readership that is best matched to this ideal audience?

Following this process almost always provides an additional benefit: the resulting journal editors are usually the best ones to evaluate and help improve your work.

As always, I advocate a reader-centered process of writing and publishing papers. If you keep the readers in mind as your first priority, picking the right journal for publication becomes a fairly straightforward task. Because a reader-centered process of writing leads to a paper written for the needs of the audience, it is important to have a target journal in mind at the start of the writing process rather than delaying such a decision until the paper is nearly finished.

Alas, many authors approach writing and publishing from an almost opposite perspective: how to best serve the needs of the author. The result is often an emphasis on quantity rather than quality, and getting the work into the hands of people most likely to reference the work rather than use the work. There should be (and often is) a great deal of overlap between what is best for the reader and what is best for the author. But finding an "and" solution (good for both author and reader) sometimes requires more effort than finding an "or" solution (good for either author or reader). The effort is worth it.

Finally, time to publication will always be an additional factor when publishing cutting-edge research. JM^3, like most journals, continues to make

progress in this area, with a median time from submission to first decision of 5 weeks and a median time from final decision to publication of about 3 weeks. If your work requires timely publication, try to find these numbers for the journal you are considering.

References

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[2] C. A. Mack, "Editorial: 350 Years of Scientific Journals", *J. Micro/Nanolith. MEMS MOEMS* **14**(1), 010101 (2015).
[3] M. Ware and M. Mabe, "The stm report", 3rd ed., *International Association of Scientific, Technical and Medical Publishers*, p. 5 (November 2012).