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Peering Through the Academic Blinds

Peer review is held up as the gold standard of legitimacy in academic publishing, but Lon Kilgore says the system has inherent flaws and isn't as foolproof as journals would have you believe.

By Lon Kilgore

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Dave Re/CrossFit Journal

As any reader of [CrossFit.com](#) and [The Russells blog](#) can attest, exercise-science journals seem to be suffering from compromised systems of publication and ethics.

As scientists, clinicians and practitioners rely on the information contained within journals to provide factual basis for their experimental, therapeutic and training activities, a corrupted system has dire effects on every aspect of

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the exercise, fitness and sport industries. This is why it is absolutely important to publicly challenge journal editors, the peer-review process and even individual researchers when warranted. We must safeguard our professional livelihoods by ensuring we are operating on fact rather than misrepresented or fabricated data.

A number of processes in academic publishing are intended to ensure the quality and accuracy of manuscripts in publication. Let's take a look at these systems, their components and their gatekeepers as they are all purported pillars of academic credibility.

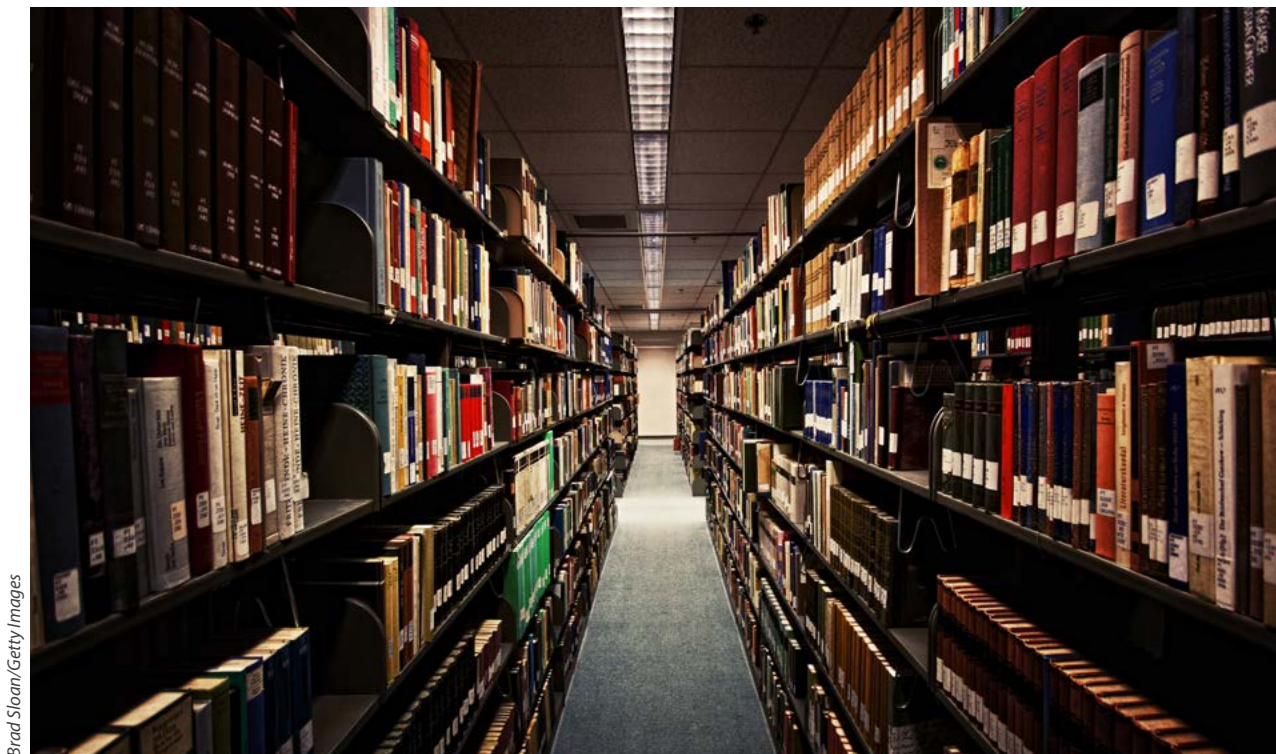
Element 1: The Scientist

The first level of consideration is the author of scientific papers, typically a faculty member at a university. These professional academics design and conduct experiments, then submit the details and results for publication in peer-reviewed academic journals. It is a basic expectation that academics will publish regularly; in fact, their continued employment is essentially linked to their publication history. If they don't publish, they generally

do not get tenure or promotion, or, in many instances, a continued employment contract. This is a harsh reality and source of tremendous professional pressure, but it is not the only pressure. To keep their jobs, academics must provide three things: teaching, research, and service to the university and discipline (their specialty subject matter).

Teaching

Universities generally derive 60 to more than 90 percent of their income from student tuition (paid by students and government sources). "Research" universities receive a small-but-significant percentage of income from grants or commercially funded research, but it should be obvious that their main income is from student tuition. University faculty must teach, and that activity absorbs a large amount of work time. Do not assume teaching only takes place in a classroom as a lecture. Teaching is hard work that requires preparation long before the classroom or lab and requires work long after class and lab time ends. Teaching, in fact, limits the time available for other academic activities.



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While research publications can serve the noble purpose of educating students, many universities see publication as an opportunity to generate revenue through research grants.

Research

To create better students, all teaching should be underpinned by the best facts and concepts available. This should be the real purpose of conducting research at most universities: Research is a tool to improve the quality of information delivered to students and the public. However, administrations look at research as a means of increasing university income through the work of individual academics in obtaining research grants from external organizations or industry. A chunk of almost every grant, or the “overhead,” goes to the university to support general operations, so it is financially beneficial for universities to obtain grants.

The work involved in writing an application for a major grant is significant. The grant application, the ethics-review application, the budget-proposal forms and many other documents add up to the equivalent of writing a short textbook. Academics generally do not get any compensation or reduction in workload for this task unless the grant is successful. If they are incredibly lucky, academics might get three or four hours per week made available for grant writing. In many instances, they do not get additional time allocations to conduct the actual research unless the grant is large enough to buy out teaching and get a temp to instruct while the contracted research is conducted. More often than not, all research activities are unfunded mandates placed upon academics.

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Here, with the scientist and his employment, begins the problem with research publication. A recent study showed that nearly 2 percent of all scientists admit to fabricating data at some point in their career. In the same study, 33 percent admitted to other ethical indiscretions during



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With the huge increase in the number of journals since 1950, many articles are read only by their authors and editors.

their professional careers. If evidence of scientific wrongdoing is discovered, the results can end careers. This is happening increasingly often, and some of the cases are quite remarkable. In 2012, anaesthesiologist [Yoshitaka Fujii](#) had a publication history of 172 papers retracted by his university and the journals in which he published them, effectively wiping out a career of work and the possibility of any future of work.

Exercise sciences are no different, with a number of active investigations into alleged unethical scientific conduct receiving press coverage in [Europe](#) and [North America](#).

But why would a scientist risk his or her career by fabricating or misreporting data in a scientific journal? Pressure to publish from employers may be a contributing factor, as [institutional publication pressure is related to author bias](#), but we cannot truly speculate about individual motivations. It is, however, important to note that with every single journal submission, an author must submit a signed acknowledgement that the paper is original work

and accurately represents the facts of the experiment reported. So each time there is a finding of academic fraud in regard to a published scientific paper, the author has twice strayed from accepted academic ethical standards.

Service

Every university has committees and leadership activities, and academics are expected to participate in carrying out these service activities. Doing so is generally not too difficult or time consuming in the U.S. model of higher education, though this service is much more involved in the U.K. model. Academics are also expected to contribute service to their profession or discipline. This means membership in professional or academic organizations and some form of contribution to those organizations. Most often, this contribution is made through membership in organizations and peer-review activities for academic journals. The peer-review system provides the second element of the problem with exercise-science publications.

Element 2: Peer Review

Scientific journals arose 400 or so years ago from activities of the members of learned societies. Membership in those societies and academies was by invitation, and the works published were quite tightly controlled. The current system of science publication only rudimentarily follows

the same processes. The old system had time for consideration, pontification, discussion and eventually publication. The new system does not; it is fast and furious.

The peer-review process follows a fairly standard path. After the completion of an experiment, a scientist, often in conjunction with a number of collaborators, will write up a formulaic report of the experiment and its results:

Introduction—The background, rationale and hypothesis/purpose of the experiment.

Methods—Description of the methods.

Results—Reporting of the outcome of the experiment.

Discussion—Contextualizing the findings and proposing conclusions.

The resulting document is submitted to a journal for consideration of publication. At this point, an editor of some status within the journal will acknowledge receipt of the manuscript and assign it to peer academics to review and determine suitability for publication.



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Teaching is required of academics, and it significantly cuts into the time available for research and writing.

This is a very tricky bit. Although the primary responsibility of the peer reviewers is to evaluate the paper's scientific merit and its relevance to the journal's mission, the meaning of "suitability" is actually left open to the interpretation of the individual reviewer. As such, a paper delivered to two peer reviewers might return review commentary that appears bipolar or seems like a good-cop-bad-cop interrogation transcript. In other cases, commentary may be focused solely upon statistics, or it may be a collection of typo corrections. Commentary may even be a balanced evaluation that improves the manuscript.

The peer reviewers exert considerable influence on the content of the papers they review because they can recommend outright rejection of a paper, require extensive revision and resubmission, or accept a paper pending minor (a very subjective term) changes in the text.

Authors love the reviews where the peer reviewer has obviously only read the abstract, scanned the article, and then made a few simple comments and suggestions to implement. They hate the ones that contain obsessive-compulsive line-by-line analyses of word choice, punctuation and grammar; what-if interrogatives; why-did-you-do-this

questions; you-should-have-done-this statements; include-this demands; and a seemingly endless amount of other minute and aggressive bits of critique. Regardless of which type of reviews are returned to the authors, they must consider including any recommended change in a revision, and they must write a written response to the journal editor detailing how they dealt with the reviewer comments, noting where they addressed them in the manuscript or justifying why they did not.

Peer reviewers are the second level of quality control in scientific publication But who are the reviewers who occupy this important position?

Peer reviewers are the second level of quality control in scientific publication, with the individual author and his or her adherence to professional ethics being the first. But who are the reviewers who occupy this important position?

The term "peer reviewer" implies the academics occupy positions similar to those of the authors of the submitted papers. This means peer reviewers are academics under the same pressures as authors, and they provide a review service for journals without any compensation—just their name listed in the journal or on the journal's website to identify them as reviewers.

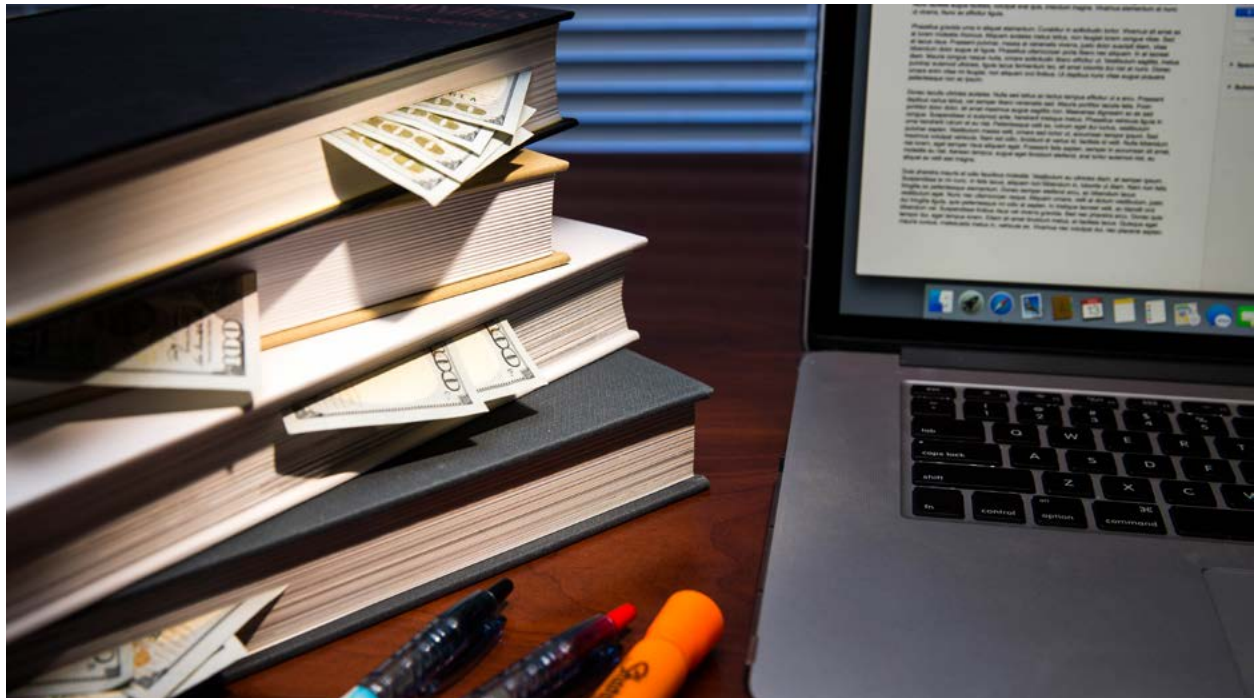
A problem with exercise-science journals is that the pressure to publish and provide service creates a situation in which clinically trained or professionally trained doctorates (these are not traditional research-intensive degrees) are called on to peer-review the research of others without having the training or experience to do so with a high degree of rigor or competence. It is also quite common for individuals to review papers without having a background—academic or experiential—specifically relevant to the paper considered. This can be illustrated when an individual who is exquisitely trained in aerobic metabolism reviews a paper on strength-training methods, or, in recent cases, when such an individual reviews a paper on CrossFit. This flaw weakens the peer review.



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With an increasing number of journals and articles, universities are hard pressed to produce qualified peer reviewers.

Dave Re/CrossFit Journal



In the publish-or-perish world of academia, journal publishers can profit from researchers whose careers depend on getting their work into print.

Additionally, the volume of papers produced has become so large and the number of journals so expansive that the need for peer reviewers and editors has outstripped the availability of qualified academics. When a just-graduated early career lecturer or assistant professor is called upon to review a manuscript outside his or her field of training, the system is flawed.

Despite the noble intent of academia, a cottage industry—an academic vanity press—has emerged to provide publication outlets to meet the huge university demand for academics to publish. Academics pay “page charges” or “publication fees” to get their works published. These are fees that journals require the academic or his or her university to pay so the work will be published. Some journals charge nothing, but many others charge up to several thousand dollars. The ACSM charges US\$3,000 for its relatively new open-access option. Interestingly, when an author pays the fee, he signs a transfer of copyright or ownership of the manuscript to the journal. It’s the opposite of normal publishing operations, in which authors are paid by publishers. This creates a fish-in-a-barrel scenario for academic publishers: Academics have to publish, so why not profit from this need?

Since 1950, the number of journals and journal articles has been estimated to have increased about 1,700 percent (2000 data). We are led to believe that the explosion of new information can only benefit us, and conceptually this is correct. However, there are more than 1.8 million science papers published each year in about 28,000 journals (and these numbers grow each year). One 2007 study suggested about half of those articles will never be read by anyone other than the authors, peer reviewers and editors of the journal.

Do these unread papers contribute to education and the real world? They really can’t, can they? So why were they written? Pressure to publish and continue employment? Why do peer reviewers review manuscripts for journals that publish papers that will never be read? Pressure to provide professional service?

Whether articles are read or unread, the review process is ideally the same in all academic journals, and peer reviewers rely on the authors to present them with facts. They cannot discriminate between fact and non-fact when they read a paper; they trust in the academic’s attestation that he or she has presented true facts. This makes ethical behavior on the author’s part a cornerstone of academic publication.



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The world of academic publishing can be nebulous, and peer review is often no guarantee of quality.

Just as it is imperative for authors to act ethically, it is incumbent on reviewers to do the same and review the paper before them fairly and objectively. It is not acceptable practice for reviewers to consider papers in topics where they cannot render informed decisions or for them to request changes in articles to enforce their own biases.

Element 3: Editors

If authors are the first level of quality control in publishing and peer reviewers are the second, then section or associate editors form the penultimate level of quality control.

When the peer review is complete and the authors have revised the paper as necessary, the associate editors (also academics who are unpaid volunteers just like peer reviewers) will make a decision whether the author has adequately addressed the reviewer comments and recommendations. They may or may not have the peer reviewers make a final recommendation prior to rendering a publication decision to the final quality-control check in the system: the editor-in-chief.

These associate editors are intended to be experts in their domain of review and to be able to separate journal-appropriate papers from those that are not relevant to the reader. They also make determinations on whether reviewer recommendations are reasonable, and they determine the merit and completeness of author responses to reviews.

The editor-in-chief is responsible, by definition, for ensuring that the papers published in the journal are fairly and objectively reviewed and that they present factual information without bias, either external (author) or internal (reviewer and editor). They are the final authority in what papers appear in the journal, and they can overrule any editorial decision. In cases of potential academic-integrity offenses, the editor-in-chief is absolutely responsible for aggressively investigating any claims or suspicions of unintentional and intentional misrepresentations of data. The editor-in-chief, along with associate editors, must consider all potential cases of author misconduct and be unafraid to reject or retract offending papers. The health of academia and the reputation of their journal demand no less.

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There is a disturbing phenomenon that occurs in some exercise-science journals when the review and editorial staff act as a coterie, a group of people who treat and develop their shared interests above those of anyone else or academia as a whole. Look at a journal's list of peer reviewers and editors, then look at the authors of the articles included in the issues. In an objective journal with a healthy review and publication process, there will be a relatively low frequency of appearance of editors and reviewers as authors. If the journal is relatively myopic and inbred, for want of a better term, the editors and reviewers will appear as authors of an exceedingly high number of

papers published by the journal. An editor-in-chief should be attentive to authorship and not allow a journal to become a potentially biased mouthpiece for a group of like-minded academics at the expense of healthy academic discourse.

The Big Question

How can we be certain the papers published in exercise-science journals are truthful?

We have to believe in the 98 percent of scientists who haven't falsified data. Without their continued and exemplary ethical behavior, academia and scientific publication is a house of cards.

We have to believe that reviewers will objectively review papers and will not use their positions to advance their own biases.

We have to believe that editors will consider publication as open scientific discussion and that their decisions on which papers appear in their journals will promote the health of the disciplines, the industries and the professional practices of their readership. It is also an absolute necessity that editors-in-chief do everything within their power to ensure their journals are pillars of integrity and that every hint of author, reviewer and editor impropriety is investigated, with any offenses dealt with in a meaningful way. This can and should entail public retraction of papers found to be intentionally or unintentionally fabricated or misrepresented.

We have to believe that universities will fully support the research activities of the academics they require to conduct research, pursue grants and publish. High-quality research and publication will not emerge from unfunded mandates and little or no specific time allocated to actually doing the laborious and time-consuming work of experimentation. Failing to address this problem can only further drive the expansion of the number of academic journals and articles no one will ever read.

And then there is the "we" in all of this. Everything presented above suggests we buy into an idealistic vision of academia, a view that allows us to believe the system will work and offenders will change. But we also have to be realistic. We, as exercise professionals, have to be equipped to read scientific articles critically. If we lack the ability to read a scientific article that is specifically

relevant to the training of our clients, we are at the mercy of those who would pass off fabrication and misinformation as truth.

And finally, we cannot shy away from questioning those who purport to be experts when there appears to be a problem. We have to be ready to act as ethical watchdogs who demand integrity in publication. Our clients, our peers, our businesses and our profession can only benefit when we do.



About the Author

Prof. Lon Kilgore graduated from Lincoln University with a B.Sc. in biology and M.Sc. in kinesiology from Kansas State University, and he earned a Ph.D. from the Department of Anatomy and Physiology at Kansas State University's College of Veterinary Medicine. He has competed in weightlifting to the national level since 1972 and coached his first athletes from a garage gym to national-championship event medals in 1974. He has also competed in powerlifting, the first CrossFit Total event, wrestling and rowing. He has worked in the trenches, as a coach or scientific consultant, with athletes from rank novices to professionals and the Olympic elite, and as a collegiate strength coach. He was co-developer of the Basic Barbell Training and Exercise Science specialty seminars for CrossFit (mid-2000s). He was a certifying instructor for USA Weightlifting for more than a decade and a frequent lecturer at events at the U.S. Olympic Training Center. He is a decorated military veteran (sergeant, U.S. Army). His illustration, authorship and co-authorship efforts include the best-selling books "Starting Strength" (first and second editions) and "Practical Programming for Strength Training" (first and second editions), recent releases "Anatomy Without a Scalpel" and "FIT," magazine columns, textbook chapters, and numerous research-journal publications. His professional goal is to provide the best quality, most practical, most accessible and highly affordable educational experiences to fitness professionals through his university work and through his AnatomyWOD and PhysiologyWOD courses. His students have gone on to become highly notable figures in weightlifting, powerlifting, cycling, fitness and academia.