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iVIEW

EDITOR'S PAGE

Journal Editors and Altmetrics

Moth to the Flame?

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Not everything that can be counted counts, and not everything that counts can be counted.
—William Bruce Cameron (1)

The recently concluded impact factor season reignites, as it does each year, interest in the vexing question of how we should measure impact—both at the level of a paper and the level of a journal. Because progress in science is built on the foundations of previous science and honestly citing prior work is *de jure* as well as *de rigueur,* a metric that looks at how useful a paper is to other investigators and how often it is acknowledged during the march of science is obviously a leading metric. Paper downloads could be another useful indicator since it indicates potential interest from the scientific community and could be tracked easily. However, a paper can generate interest in other ways too. Investigators might share, recommend, and comment about research on forums far removed from the journal; readers who may not have the opportunity to conduct research and publish (and thus cite papers) might have an opinion on it too and this could add to crowd-sourced wisdom; and, finally, the general end users of research (society) may say something about published research through policy guidelines or cultural shifts. These important dimensions of impact are not captured by traditional scholarly metrics of journal impact. An increasing proportion of scientific interaction is now in the online realm where data are discovered, read, discussed, commented on, liked or disliked, shared, and recommended. A popular way to understand this nontraditional impact of research is through "alternative metrics" (Altmetrics), which comprehensively capture data from online interactions about any particular paper or advance in science.

How these different flavors of impact, that is, those generally geared toward the scientific community (citations and downloads) and those that focus on a wider audience of scientists as well as nonscientists (Altmetrics), relate to each other is still an evolving issue. Emerging evidence suggests that Altmetrics can modestly predict future citations (2). However, despite all its obvious advantages (e.g., improving journal exposure, disseminating papers, creating a buzz about their content, educating readers using online social media tools) and exhortations to latch onto this dominant resource, editors in general have not harnessed social media platforms effectively (3). The majority of editors have accounts on social media, but only a minority remain active, and an even smaller percentage make a noticeable impact (e.g., in terms of followers or being influencers).

iJACC has an active social media presence as well as highly accomplished and energetic social media editors, but our editorial board is also highly cognizant that we have not yet embraced it with the full gusto it can merit. Is this lethargy, languor, and ennui on our part, or can it also be a rational use of limited time and resources? How can an editorial board, not blissfully ignorant of the charms of Altmetrics, optimally allocate increasingly finite resources to maximize utility? We looked at these questions using metrics for papers published in *iJACC*. Given the relatively recent popularity of Altmetrics and the differential rate of accrual for different scores, we used a 3-year window to look at citations in 3

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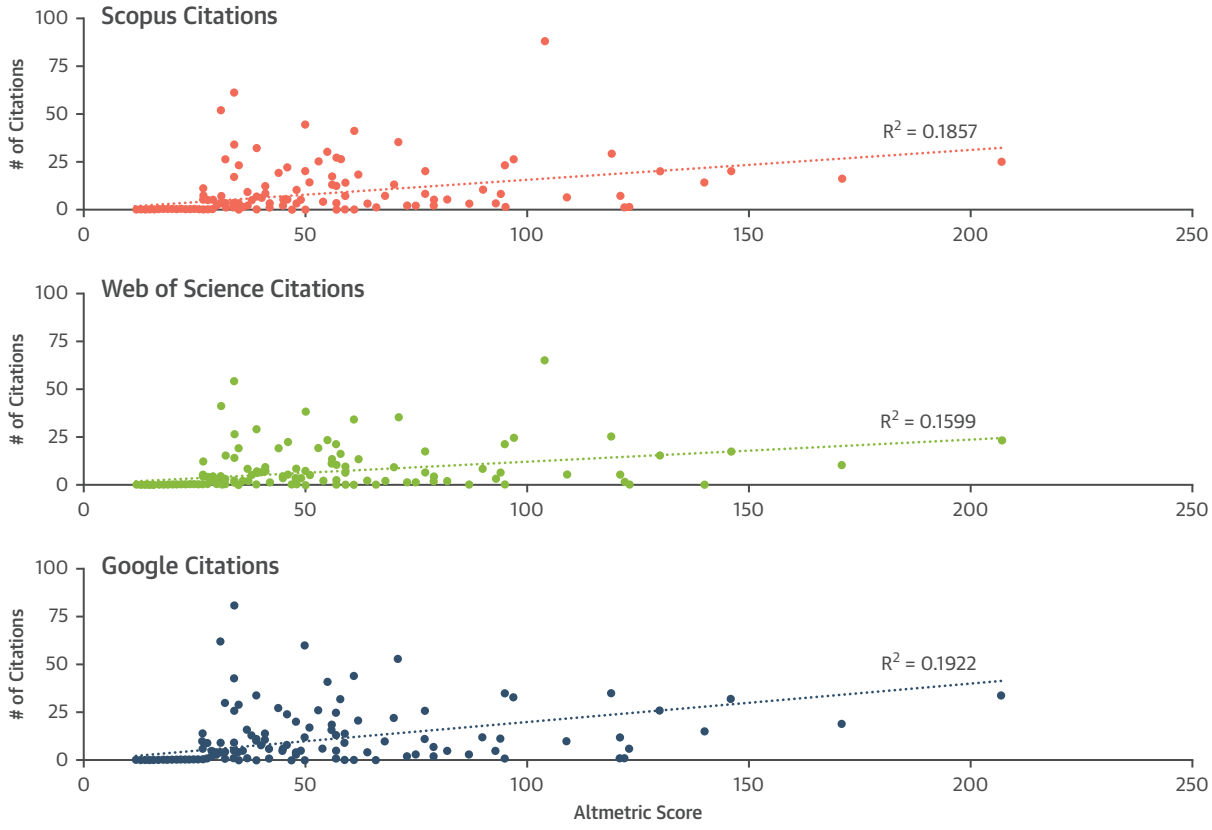
FIGURE 1 Correlations Between Top 100 Altmetric Scores and Scopus, Web of Science, and Google Citations



databases (Web of Science, Scopus, and Google Scholar), downloads and usage (at journal and publisher websites), and Altmetric scores. A full analysis is the subject of a future paper, but some facts stand out in a preliminary look at the top 100 papers ranked by Altmetric scores. Altmetrics and citations (using any of the databases) correlate poorly with each other (**Figure 1**). It seems that the papers generating the most interest on social media platforms are not those that excite authors enough to quote those works as relevant to their own research papers. Alternately, the journal audience citing research may vary or have different interests from those that create the buzz about *iJACC* papers. Second, Altmetrics don't seem to predict download behavior either, whereas citations have a stronger correlation to downloads. Finally, even though different citation databases produce slightly different numerical outputs, they are very tightly correlated, suggesting adequate capture and coverage of the citation universe.

Which papers generate excitement in the Altmetrics world and which don't in the citation world? In general, papers with the highest Altmetric scores (>100) did not show any consistent pattern. Reviews can generate citation interest, but they were not as prominent from an Altmetrics point of view. The ones with good scores were but a small fraction of our total reviews (4-10) and did not show any noticeable topic preference. Athlete's heart (10-12) and coronary computed tomography plaque (13-16) were prominent in original papers with the highest Altmetric scores, with a multitude of various topics forming the rest of the list (17-21). The papers with the lowest Altmetric scores also were varied, with no consistent topic or modality preference (22-34).

What can we make of these findings? How people acknowledge another's work is a complex question (35), and the drivers may be clearly different in the online sphere versus academic scholarly publishing. The latter expects honest citation of other seminal work. It provides no rewards for doing so and may impose a reputational penalty for not complying with the norm.

The online environment underlying the Altmetrics score works the other way. There is no prior

expectation. It adds no penalty but values information and rewards the contributors of information (often generated by other authors) with instant and amplifiable attention, something that formally citing another's work in journal publications does not provide in equal ease or measure. Generating academic capital (garnering a label as a trusted expert) or social capital (garnering a label as a prominent influencer), or establishing an emotional cloud connection between the social media poster, the authors, and the work, could itself be motivation for activity on the social media space. There is sometimes a possible incentive for multiplying this effort (e.g., through retweets) to cement this connection further.

Some of the disconnect between citations and Altmetrics could just be the fact that they measure (or at least are intended to measure) different things. Altmetrics reflect crowd attention and probably say little about quality, novelty, or originality, except insofar as the person posting thought the work to be attention-grabbing or otherwise important. In addition, just like the impact factor, Altmetrics have many limitations, and more are being identified each year. Also, personal biases (individual tastes or perfunctory citations), automation (bots that generate retweets to magnify Altmetrics impact), and amplification of links to published content by publishers or societies may result in the Matthew effect (i.e., "wealthy" influencer or content is rewarded with additional wealth). The speed of the Internet and the freedom to post without prior peer review make it easy to gather attention and self-generate greater visibility. It is telling that an untrue story may travel wider and faster than a true one (36). Finally, Altmetrics, unlike the usual scholarly metrics, can rarely even decrease despite no change in the quality or importance of the original paper!

Social media has a broader mandate and opportunity than traditional vehicles, and it might be shortsighted to measure it with our traditional yardsticks of scholarly value and impact. Whereas journals typically disseminate peer-reviewed scholarship, social media (which Altmetrics reflect) incorporates function of discovery, dissemination (often not limited by subscriptions or firewalls), sharing beyond peer groups, democratized comment, and largely unfiltered critique. Thus, it is more capable of what it is intended to do—be an attention metric rather than a quality metric. The novelty or originality of a paper may be of lesser concern for creating interest in the online community, and papers that create buzz or are trendy may have a higher premium for display and sharing. However, our fixation on novelty or originality might need a rethink too. Crowd-sourcing discussion may still foster the primary goal of science— sharing ideas and generating discussion and debate—but it is just done in a different environment or format.

Of course, it is imperative that journals think and use these newer metrics, but they also should constantly keep asking the hard questions. What exactly are they measuring? Are all components (e.g., news sites, blogs, policy documents, patents, Wikipedia, twitter, publons, Facebook, YouTube) of a differentially weighted index (i.e., one that constantly changes its way of measuring value in terms of both the underlying components that contribute to the score and the technology used to vacuum these datapoints from the Internet) of meaningful value? What do they mean in terms of the progress of ideas and patient care? It would also be a mistake to consider it a panacea for the ills of current quality metrics, such as the impact factor, CiteScore, SJR (SCImago Journal Rank), journal h-index, or Google Scholar rank. *iJACC* will continue to explore benefits of social media (easier discovery of knowledge, wider dissemination, and slicker delivery of educational content) but remain acutely aware that its derivatives like Altmetrics may "measure what is technically feasible instead of what is sensible" (37).

We will, meanwhile, actively solicit papers evaluating the clinical impact of these measures and encourage imagers to send us their work, looking at this issue critically. The future might need a completely different quality metric—a scale where we are judged on a range of metrics—quality, reproducibility of data, open availability of original data behind a paper, reach, usage, and the amount of secondary content generated by the original communication. Unfortunately, none of these metrics will actually measure the most important things journals set out to do—have a broad, clinically meaningful impact on improving care and patient outcomes. We need a new "killer app" for that!

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