

# In Search of Outstanding Research Advances – Exploring Editorial Recommendations

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**Abstract.** Over the last decades, several channels of scientific recognition have developed within the research system to highlight outstanding scholarly contributions. From the widespread use of bibliometric measures to alternative metrics in social media, one well respected, but still less exploited source of recognition for scientific work is the judgement of experts. Similar to prize awarding committees, major science journals have created special sections recommending articles, usually curated by scientific editors, to feature outstanding research advances from the continuously growing pool of scholarly publications. In the present article, we briefly describe these editorial recommendations and compare them to concurrent ways of identifying outstanding research. We highlight their advantages and limitations, presenting several types of such recommendations according to their scope, regularity of occurrence, and target audience. Our work in progress shows the promising potential of scholarly articles identified by editorial recommendations for analysis of scientific advances. We propose the idea of creating openly available datasets of editorial recommendations with community-based maintenance and curation. As a next step, we aim at comparing these editorial recommendations with currently established measures of research impact.

**Keywords:** Scientometrics · Outstanding research · Editorial recommendations.

## 1 Introduction

Publishing research results in academic journals is a fundamental part for the advancement of science, and since the Second World War the number of scholarly articles published every year has grown steadily [1]. It is obvious that not all of those articles are of equal importance for the progress of science, and only a small portion represent outstanding landmarks (see [2] for an estimation of 0.02%). A crucial question that arises in this context is how to identify the most outstanding contributions in this large pool of scientific publications.

The scientific community has developed several channels of recognition to filter through the immense collection of research knowledge. Up to now, the most common way to identify outstanding scholarly articles relies on bibliometric indicators. However, measures of citation performance have also attracted a lot of criticism, since motivations behind citing are unclear [3], and articles should be

at least three years old when included in the calculations of a citation index [4]. This means that for the assessment of the most recent research publications no reliable citation indicator is available. To remedy the problems encountered with bibliometric measures, the scientific community has come up with several alternative ways to detect influential research work.

First, with the rise of the internet, scientific evaluators have started to consider quicker ways of assessing research impact, called alternative article-metrics [5]. They refer to an article's web attention such as mentions on the news, in a blog, in tweets or on Facebook, but can also incorporate longer-term markers like download statistics and article comments. Alternative metrics reflect the visibility and influence of a scholar's research in the public domain. The clear advantage of alternative metrics is their immediate availability, although at the same time lacking thorough scientific evaluation.

A more traditional way of scientific recognition comes from evaluations by scientific committees that award prizes for outstanding research contributions. Scientific journals that, for example, aim to identify their most outstanding publications of the past year usually consider recommendations of well-respected experts, judging the potential influence of recent publications on the scientific community. Similarly, many scientific editors have restructured their journals into dedicated sections to provide better visibility of outstanding articles from among the high number of weekly scholarly publications. The major science journals like Nature and Science strive to inform on pioneering and innovative science, providing a weekly selection about especially outstanding contributions from among all of their publications (e.g., Nature's "News & Views" or "This Week in Science") and from outside of their journal (e.g., Nature's "Research Highlights" or Science's "Editor's Choice"). These highlighted sections curated by experts, usually the scientific editor, refer to scholarly articles as being especially influential and promising for future research developments. In this sense, the scientific editors act as the guardians of science who guide the attention of the scientific community. In sum, such editorial recommendations are readily available in science journals, and carry a precious expert judgement of scientific quality that is missing in the previously mentioned metrics.

To the best of our knowledge, this type of scientific recognition has not been sufficiently exploited in past quests for identifying outstanding research advances (but see [6]). Thus, in this ongoing project, we propose to explore and collect this valuable information in a more comprehensive way for research monitoring [7].

## 2 Method

For the present purpose, we defined editorial recommendations as an overarching term regrouping scholarly articles that have attracted special attention from a scientific committee or editor and that have been judged as outstanding new contribution of knowledge. For our definition, there must be a clear human judgement made by a respected scientific authority regarding the excellence of

a scholarly article. This kind of judgement is based on scientific merit and the authority's knowledge of the community.

Before evaluating research impact, it is important to distinguish between several types of editorial recommendations that each draw their selection from a different pool of scholarly articles. We can distinguish editorial recommendations according to their scope (inwards vs. outwards), regularity of occurrence (weekly vs. annual) and the targeted community (scientific vs. general public). In the present work, we collected current examples from scientific magazines for each of these categories. Pointing out the various constraints underlying the selection of editorial recommendations is important for a better characterization of the experts' judgement, especially when claims and measures about research impact shall be compared or generalized.

Datasets of editorial recommendations were created from the information available on the journals' websites. The collection of Digital Object Identifiers (DOIs) for scholarly articles was in most cases a manual task, although some of the data acquisition could be automated. However, automated retrieval procedures were always followed by a substantial effort in data cleaning and curation, since references of editorial recommendations to many DOIs were missing or unstructured.

We collected several datasets of DOIs for various types of editorial recommendations according to scope, regularity, and target audience (e.g., Nature's "Research Highlights", Science's "Editor's Choice" and "Breakthroughs of the Year", La Recherche's "Découvertes de l'Année" and "Prix La Recherche", Physics World "Top 10 Breakthroughs", the "Cozarelli Prize" in Proceedings of the National Academy of Sciences, etc.). For example, in the case of the weekly occurring "Research Highlights" in Nature, we collected a dataset with over 5000 editorial recommendations of scholarly publications for a period from 2008-2020. After matching this dataset with the publications generated from funded projects by the European Research Council (ERC), we identified that  $\tilde{5}\%$  of the recommended articles of Nature's "Research Highlights" were associated with funding by the ERC. This quick analysis identifies an interesting set of outstanding research contributions by using recommendations from scientific experts and provides a new approach to evaluating research output compared to current practices.

### 3 Outlook

Overall, preliminary results of our data collection are encouraging, since the results provide valuable insights beyond classical measures for research analysis. In addition, the cleaned datasets of unique DOIs can be linked easily to any existing research information graph like Springer Nature SciGraph. Our motivation is to make this new type of information readily available for the community in accordance with the FAIR principles [8]. Wikipedia/Wikidata are possible options for publication, as they would make the curation of the datasets a collective and collaborative effort. Main caveats for data acquisition of future editorial

recommendations are the tedious manual cleaning involved due to unstandardized data records on the journal websites. Next steps of this work in progress entail the systematic evaluation and comparison of editorial recommendations with concurrent measures of research impact.

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