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Assessing the Reliability of Google Scholar in Predicting Scopus Citation Metrics

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Abstract

This study analyzed the relationship between bibliometric metrics—specifically the H-index and citation counts—obtained from Google Scholar and Scopus, two widely used databases for assessing research impact. The analysis was based on data from 30 academics affiliated with the University of Verona. Strong correlations within each database were observed, demonstrating that both consistently capture similar patterns of scientific impact. The high degree of concordance between Google Scholar and Scopus metrics also indicates that they provide comparable rankings and relative measures of academic performance, despite differences in absolute values. On average, citation counts from Scopus were 33.8% lower than those from Google Scholar, while H-index values from Scopus were 16.8% lower. These findings highlight the critical importance of database selection in research evaluations, advocating the use of complementary metrics

derived from multiple databases to achieve a balanced and comprehensive assessment of scientific impact, while also accounting for the unique strengths and limitations of each bibliometric source.

1. Introduction

The evaluation of scientific productivity and impact is an essential aspect of academic research, with citation metrics playing a pivotal role in assessing the performance of individuals (especially scientists and academics) and institutions (1,2). Among these metrics, the Hirsch index (H-index) has gained widespread acceptance as it integrates two key dimensions of academic output: the volume of research (i.e., the number of publications) and its quality (i.e., the number of citations per publication) (2). By condensing these factors into a single, objective and clearly interpretable value, the H-index offers a practical and objective estimate of scientific impact and is extensively use in decisions related to funding, hiring, promotions, and awards (3). Among these purposes, the Italian National Scientific Habilitation (Abilitazione Scientifica Nazionale, ASN) is a qualification framework established to evaluate the academic and scientific credentials of candidates seeking eligibility for associate or full professorships in Italian universities. This system is governed by criteria and metrics that are discipline-specific and defined by the Italian Ministry of Education, University, and Research (MIUR). The evaluation process primarily focuses on bibliometric indicators, including the number of peer-reviewed publications, total citation count, and the H-index. These metrics are calculated using data from internationally recognized databases, namely Scopus and Web of Science.

It is now universally recognized that the reliability of the H-index and citation counts depends critically on the database from which these metrics are derived. Databases such as Google Scholar and Scopus differ significantly in their methodologies for indexing, tracking, and aggregating citation data, often leading to discrepancies. Google Scholar provides expansive coverage, incorporating gray literature, conference proceedings, and non-peer-reviewed sources (4). This broad scope results in higher citation counts but also exposes the data to potential manipulation, such as artificially inflated citation metrics through low-quality or fabricated publications. In contrast, Scopus focuses exclusively on peer-reviewed journal articles and employs stringent indexing criteria, resulting in lower but more accurate and reliable citation metrics (4). These fundamental differences raise

critical concerns on the comparability of bibliometric metrics across these two databases. Variability introduced by factors such as database coverage, indexing policies, and citation inflation can significantly influence how researchers are evaluated and perceived within the scientific community (5). Such inconsistencies underscore the need to systematically assess correlations and discrepancies between citation counts and H-index values derived from different platforms.

We have hence planned this analysis to compare citation counts and H-index values from Google Scholar and Scopus for a cohort of scientists affiliated with the University of Verona. By quantifying these differences, we seek to provide insights into the concordance between these databases and offer guidance for informed use of bibliometric tools in research evaluation processes, including the ASN.

2. Materials and Methods

On December 13, 2024, we conducted an analysis to identify the top scientists affiliated with the University of Verona based on citation metrics. Using Google Scholar, we entered the term “Verona” in the search field, yielding a list of academics with validated profiles containing the keyword “Verona.” The scientists were ranked by the total number of personal citations. After excluding individuals not affiliated with the University of Verona, we retained the top 30 scientists for further analysis. For each of these top 30 scientists, we accessed their Google Scholar profiles to collect the current number of citations and H-index values. This process did not distinguish between active and retired academics. Subsequently, we used the “Scopus Author Search” tool to locate each scientist in the Scopus database by entering their first and last names. When multiple Scopus profiles for the same individual were identified, we merged them to obtain cumulative values for citations and H-index. The data collected from Google Scholar and Scopus were entered into an Excel spreadsheet for statistical analysis, encompassing the calculation of Spearman’s correlation (with 95% confidence interval; 95% CI) and Bland-Altman plots, using Analyse-it software (Analyse-it Software Ltd, Leeds, UK). Statistical significance was set at $p<0.05$. To ensure anonymity and eliminate the need for informed consent or ethical approval, all scientists’ names were anonymized prior to the statistical analysis.

3. Results

The correlation between individual citation counts and H-index values obtained from Google Scholar and Scopus is shown in Figure 1. A highly significant correlation was observed in both cases, with r=0.85 (95% CI: 0.70–0.82; p<0.001) for Google Scholar and r=0.76 (95% CI: 0.54–0.88; p<0.001) for Scopus, respectively.

Figure 1. Correlation between individual citation counts and H-index values obtained from Google Scholar (a) and Scopus (b).

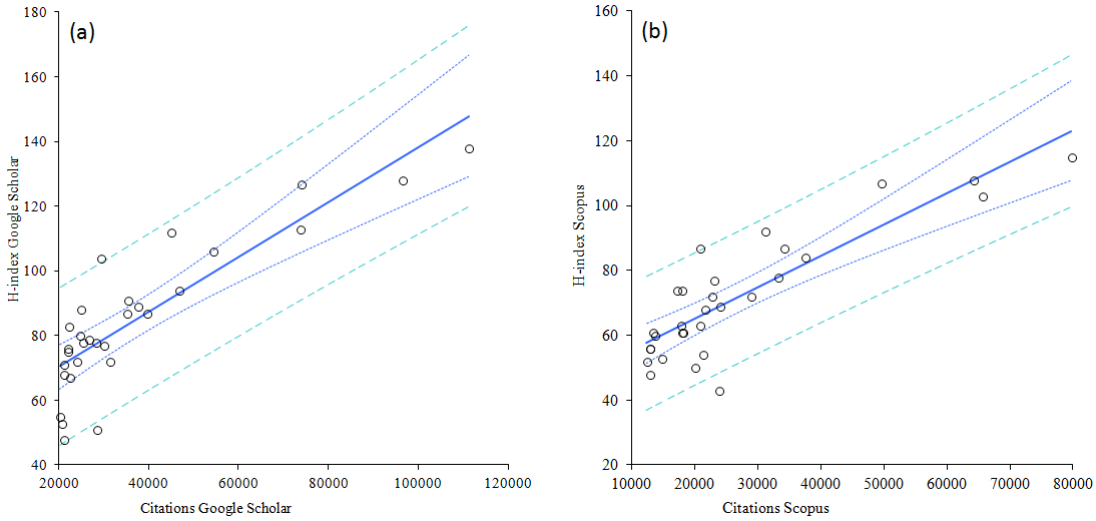


Figure 2 shows the correlation between H-index values and citation counts across the two databases. Similarly, strong and significant correlations were found, being r=0.95 (95% CI: 0.91–0.98; p<0.01) for the H-index and r=0.89 (95% CI: 0.78–0.95; p<0.01) for citation counts by comparing Google Scholar and Scopus data.

Figure 2. Correlation between H-index values (a) and citation counts (b) in Google Scholar and Scopus.

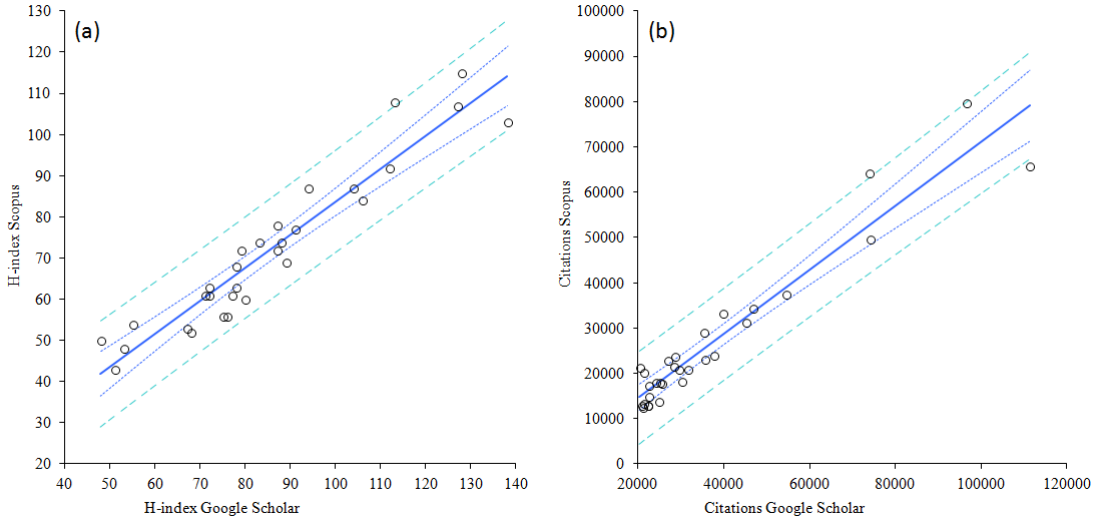
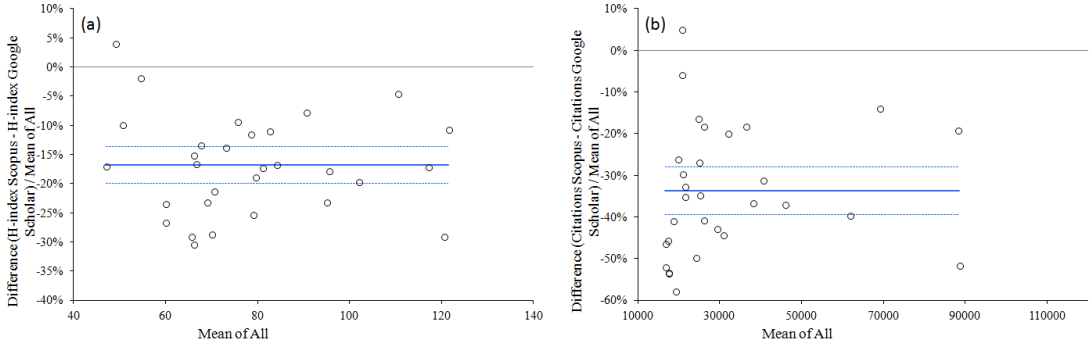


Figure 3 shows the percentage differences in H-index values and citation counts between the two databases with Bland-Altman plots. Citation counts were on average 33.8% lower in Scopus compared to Google Scholar (95% CI: 28.0–39.5%; p<0.001), while the H-index in Scopus was, on average, 16.8% lower than in Google Scholar (95% CI: 13.7–20.0%; p<0.001).

Figure 3. Percentage differences in H-index values (a) and citation counts (b) between Scopus and Google Scholar.



4. Discussion

Despite their well-documented limitations, bibliometric indices such as the H-index and citation counts are widely employed to assess research impact, facilitate comparative analyses among researchers within the same field, evaluate career progress (1-3), and even asses eligibility for academic positions in countries like Italy. Given the importance of ensuring that evaluation systems are both objective and reliable, it is crucial to derive these metrics from trustworthy sources where the risks of manipulation or inflation are minimized. For this reason, Google Scholar, although widely used by researchers to showcase their academic output, is rarely adopted in official evaluations. To this end, the results of our analysis highlight several important observations regarding the relationship between citation counts and H-index values obtained from Google Scholar and Scopus.

First, we found strong correlations between H-index values and citation counts within each database, thus suggesting that either retrieved from Google Scholar or Scopus, they consistently reflect similar patterns of scientific impact and both databases provide comparable rankings and relative measures of academic impact. Nonetheless, our analysis reveal substantial differences in absolute metrics between the two databases. Citation counts from Scopus were, on average, 33.8% lower than those from Google Scholar, and the H-index values from Scopus were 16.8% lower. These discrepancies likely arise from the broader and less selective coverage of Google Scholar, which includes non-peer-reviewed sources and gray literature. While this broader scope can inflate metrics in Google Scholar, the stricter indexing policies of Scopus result in more conservative but potentially more reliable values.

In conclusion, while Google Scholar and Scopus exhibit strong concordance in their ranking of researchers, systematic differences in their reported metrics emphasize the need for careful consideration of database selection in research evaluations. These results underscore the importance of using complementary metrics and multiple databases to ensure a balanced and robust assessment of scientific impact.

Declarations

Conflict of Interest

The Author declares that there is no conflict of interest.

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