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The SPR-Index: A Novel Metric Integrating the H-Index with Verified Peer Review Scores

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Abstract: This manuscript introduces the Scientific Peer Review Index (SPR-index), a novel metric designed to enhance the H-index by incorporating verified peer review records from the Web of Science database. The SPR-index aims to provide a more comprehensive assessment of researchers by considering not only their publication record but also their contributions to the peer review system—an essential yet often overlooked aspect of academic work. Given the increasing difficulty in finding qualified reviewers, this metric aims to recognize and incentivize peer review efforts. The SPR-index is calculated as the product of a researcher's H-index, normalized by their number of publications, and the total number of verified peer reviews, offering a more nuanced measure of their academic impact. Additionally, we propose factoring in review length to acknowledge researchers who provide in-depth evaluations that exceed the average word count. However, its successful implementation depends on improvements in Clarivate's peer review data collection, particularly in enhancing the accuracy and completeness of verified review records. Researchers must also ensure their reviews are visible in the Web of Science by selecting appropriate visibility settings. The further refinement and validation of this metric are needed to support its widespread adoption in the academic community.

Keywords: SPR-index; H-index; peer review metrics

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1. Introduction

The H-index, introduced by Jorge E. Hirsch in 2005, is a widely used metric for quantifying a researcher's productivity and impact. Defined as the number of publications (h) that have received at least h citations, it has become a standard tool for evaluating scholarly output due to its simplicity and effectiveness (Glänzel, 2006; Hirsch, 2005). However, while the H-index provides a useful measure of citation impact, it fails to capture other critical aspects of academic contributions. One of the most significant omissions is peer review activity, an essential yet often overlooked component of scholarly engagement.

Assessing the significance of scientific research and individual performance is crucial for funding agencies, promotion committees, and policymakers. Bibliometric indicators such as the impact factor (IF) and the H-index are widely used tools for evaluating research performance (Bornmann & Daniel, 2009). Despite their utility, these indicators often oversimplify the complexities of research assessment. Adler et al. (2009) argued that the H-index and similar metrics reduce a complex citation record to a single number, potentially overlooking other meaningful scholarly activities. Nevertheless, the H-index remains a widely adopted comparative measure among major publishers and research institutions.

Various enhancements and alternatives to the H-index have been proposed to address its limitations. The G-index, introduced by Egghe (2006), improves citation impact measurement by assigning greater weight to highly cited publications, providing a more comprehensive assessment of a researcher's influence. However, it remains solely citation-based, potentially favoring established researchers over early-career academics. Similarly, network-based adaptations of the H-index, such as the lobby index, h-degree, and c-index, have been developed to assess academic influence in specific contexts (Ding et al., 2020; Yan et al., 2012; Schubert & Glänzel, 2007). The Uh-index further expands research evaluation by incorporating usage data (Qiao et al., 2025). Despite these adaptations, none adequately account for peer review—a fundamental pillar of academic integrity.

Peer review contributions, while crucial to maintaining the integrity of the scientific process, remain largely absent from existing bibliometric measures (Nguyen & Tuamsuk, 2024). The increasing prevalence of open access journals, many of which charge publication fees, further complicates the peer review ecosystem. Researchers are often reluctant to review for such journals, increasing the burden on those who continue to engage in peer review (Tennant et al., 2016). Despite these challenges, dedicated reviewers play a vital role in sustaining the peer review process, underscoring the need for metrics that recognize and reward their contributions (El-Guebaly et al., 2023).

To address this gap, we propose the SPR-index, an extension of the H-index that incorporates a researcher's engagement in peer review. The SPR-index considers both the number of publications and the number of verified peer reviews, providing a more comprehensive evaluation of a researcher's impact within the scientific community (Tennant, 2018). Verified peer reviews can be sourced from platforms that track peer review activity, such as Web of Science (Teixeira da Silva & Nazarovets, 2022). For instance, if a researcher has published 100 articles and reviewed 110, their preliminary peer review metric would be 1.1, as detailed further.

Beyond quantifying peer review contributions, the SPR-index introduces review length as a potential factor in its calculation. Review length may reflect the depth of engagement and effort a researcher invests in evaluating manuscripts (Chigbu et al., 2023). We propose rewarding researchers whose reviews exceed the average word count in their field, recognizing their commitment to providing detailed and constructive feedback. The SPR-index aims to assess researchers based on both their reviewing activity and the extent of their reviews relative to the global average.

Field-normalized citation impact indicators are essential for cross-disciplinary comparisons, and this study underscores the necessity of fractional counting over full counting for proper normalization, particularly in bibliometric analyses at national and institutional levels (Waltman & van Eck, 2015). Since its introduction, the H-index has been adapted to various contexts, including network-based analyses (Zhao et al., 2011). This versatility has inspired the development of derivative metrics, yet none have successfully integrated peer review contributions into research evaluation.

In this article, we introduce the SPR-index, a novel metric that incorporates peer review activity into scholarly assessment, providing a more comprehensive evaluation of researchers' contributions to the scientific community. By recognizing peer review efforts and incentivizing greater participation in the review process, the SPR-index represents a step toward a more balanced and integrative approach to research evaluation. However, its successful implementation depends on improvements in Clarivate's peer review data collection, particularly in ensuring the accuracy and completeness of verified review records. The further refinement and validation of this metric are necessary for its widespread adoption in the academic community.

2. Materials and Methods

2.1. Data Acquisition and Validation

The researcher data used in this study were obtained from the 2024 Clarivate Highly Cited Researchers™ list, which includes 6886 researchers across various disciplines. Compiled by Clarivate™, this list highlights scientists and social scientists with exceptional influence in their fields. The full list is publicly available at https://clarivate.com/highly-cited-researchers/ (accessed on 2 February 2025). For our analyses, we selected the first 690 researchers from this dataset, ensuring statistical representativeness (see Section 2.6 for details). We then calculated the SPR index (as detailed below) for the researchers. Notably, the SPR index could only be determined for 517 researchers, as their profiles were confirmed on the Clarivate™ platform, ensuring full data availability. To illustrate different aspects of the SPR-index, we constructed the following tables: (i) Table 1 presents the 40 top researchers with the highest H-index, allowing a direct comparison between the H-index and SPR-index among the most cited individuals; (ii) Table 2 lists the 20 researchers with the highest SPR-index, none of whom appear in Table 1, demonstrating that peer review contributions are often made by individuals who are not necessarily the most cited; (iii) Table 3 refines the SPR-index calculation by incorporating a correction factor based on review length (detailed below), highlighting the impact of extensive peer review contributions; and (iv) Table 4 includes 40 mid-career researchers (H-index = 15–25), enabling a comparison between highly cited and mid-career researchers in terms of peer review engagement. Data on mid-career researchers were sourced from Perneger (2023), which analyzed authorship and citation patterns among highly cited biomedical scientists.

2.2. Peer Review Metric

The peer review metric is defined as the ratio of the total number of peer reviews conducted to the number of publications. Although the number of peer review invitations received (C) would more accurately reflect a researcher's willingness to engage in the peer review process, this information is not publicly available. Therefore, we use the number of publications (P) as a proxy for visibility within the academic community as it correlates with the likelihood of being invited to review:

$$\text{Peer Review Metric} = \text{N}^\circ \text{ of Reviews Conducted } (R)/\text{N}^\circ \text{ of Publications } (P) \quad (1)$$

This ratio provides an insight into the relative balance between a researcher's contributions as an author and as a peer reviewer. However, to simplify interpretation, we redefine the SPR-index in the next section as a direct function of R, thereby avoiding reliance on this intermediate metric.

Table 1. The H-index and corrSPR-index of the top 40 researchers with the highest H-index.

H-Index	corrSPR-Index	ID Number	Profile	Publications	Sum of Times Cited	Reviews	Average Review Length	Peer Review Metrics	Collection Date (2025)
205	-	F-1813-2013	https://www.webofscience.com/wos/author/record/F-1813-2013, accessed on 20 April 2025	668	258,199	0	0	-	6-Feb
203	24.26	AAC-5044-2019	https://www.webofscience.com/wos/author/record/AAC-5044-2019, accessed on 20 April 2025	917	144,923	37	559	0.04	4-Feb
195	1.35	AFL-3518-2022	https://www.webofscience.com/wos/author/record/AFL-3518-2022, accessed on 20 April 2025	2450	168,643	5	276	0.00	4-Feb
193	-	ADA-0497-2022	https://www.webofscience.com/wos/author/record/ADA-0497-2022, accessed on 20 April 2025	1065	152,473	0	0	-	3-Feb
190	-	D-1800-2014	https://www.webofscience.com/wos/author/record/D-1800-2014, accessed on 20 April 2025	745	157,657	0	0	-	10-Feb
169	3.15	ABE-6383-2020	https://www.webofscience.com/wos/author/record/ABE-6383-2020, accessed on 20 April 2025	2355	205,660	13	331	0.01	10-Feb
166	-	AAQ-5140-2020	https://www.webofscience.com/wos/author/record/AAQ-5140-2020, accessed on 20 April 2025	1133	122,138	0	0	-	10-Feb
165	4.84	Y-3070-2019	https://www.webofscience.com/wos/author/record/Y-3070-2019, accessed on 20 April 2025	3231	145,562	27	115	0.01	6-Feb
165	-	B-7840-2010	https://www.webofscience.com/wos/author/record/B-7840-2010, accessed on 20 April 2025	480	164,833	0	0	-	2-Feb
165	-	ADH-8497-2022	https://www.webofscience.com/wos/author/record/ADH-8497-2022, accessed on 20 April 2025	846	121,839	0	0	-	2-Feb
162	-	ABE-9307-2021	https://www.webofscience.com/wos/author/record/ABE-9307-2021, accessed on 20 April 2025	720	97,265	0	0	-	3-Feb
161	13.63	ADZ-0156-2022	https://www.webofscience.com/wos/author/record/ADZ-0156-2022, accessed on 20 April 2025	1200	172,659	33	234	0.03	6-Feb
159	-	K-9344-2013	https://www.webofscience.com/wos/author/record/K-9344-2013, accessed on 20 April 2025	809	87,146	0	0	-	3-Feb
157	-	D-3458-2014	https://www.webofscience.com/wos/author/record/D-3458-2014, accessed on 20 April 2025	1678	115,272	0	0	-	10-Feb
154	-	C-1706-2012	https://www.webofscience.com/wos/author/record/C-1706-2012, accessed on 20 April 2025	891	104,601	0	0	-	10-Feb
153	-	C-3638-2011	https://www.webofscience.com/wos/author/record/C-3638-2011, accessed on 20 April 2025	2148	110,880	0	0	-	6-Feb
152	-	A-3431-2008	https://www.webofscience.com/wos/author/record/A-3431-2008, accessed on 20 April 2025	1302	109,736	0	0	-	10-Feb
149	-	JPA-2618-2023	https://www.webofscience.com/wos/author/record/JPA-2618-2023, accessed on 20 April 2025	783	89,928	0	0	-	4-Feb
148	0.64	O-6454-2015	https://www.webofscience.com/wos/author/record/O-6454-2015, accessed on 20 April 2025	1452	136,938	2	Not showed	0.00	10-Feb
147	-	K-8941-2012	https://www.webofscience.com/wos/author/record/K-8941-2012, accessed on 20 April 2025	489	74,871	0	0	-	4-Feb
145	0.88	G-4142-2012	https://www.webofscience.com/wos/author/record/G-4142-2012, accessed on 20 April 2025	436	84,062	1	Not showed	0.00	10-Feb

Table 1. *Cont.*

H-Index	corrSPR-Index	ID Number	Profile	Publications	Sum of Times Cited	Reviews	Average Review Length	Peer Review Metrics	Collection Date (2025)
145	-	E-2959-2010	https://www.webofscience.com/wos/author/record/E-2959-2010, accessed on 20 April 2025	932	115,272	0	0	-	10-Feb
144	-	F-2571-2011	https://www.webofscience.com/wos/author/record/F-2571-2011, accessed on 20 April 2025	1951	124,851	0	0	-	5-Feb
142	-	AAI-7767-2021	https://www.webofscience.com/wos/author/record/AAI-7767-2021, accessed on 20 April 2025	1717	88,249	0	0	-	6-Feb
140	5.46	A-6599-2008	https://www.webofscience.com/wos/author/record/A-6599-2008, accessed on 20 April 2025	1843	92,497	22	352	0.01	4-Feb
140	0.53	HTS-1256-2023	https://www.webofscience.com/wos/author/record/HTS-1256-2023, accessed on 20 April 2025	755	86,555	1	Not showed	0.00	3-Feb
138	0.28	LPP-2269-2024	https://www.webofscience.com/wos/author/record/LPP-2269-2024, accessed on 20 April 2025	1584	72,881	1	Not showed	0.00	6-Feb
136	1.20	E-9390-2011	https://www.webofscience.com/wos/author/record/E-9390-2011, accessed on 20 April 2025	636	94,453	2	161	0.00	10-Feb
135	-	S-6474-2017	https://www.webofscience.com/wos/author/record/S-6474-2017, accessed on 20 April 2025	352	143,624	0	0	-	4-Feb
135	-	AAR-1183-2021.	https://www.webofscience.com/wos/author/record/AAR-1183-2021, accessed on 20 April 2025	1168	138,647	0	0	-	6-Feb
135	-	ISS-6755-2023	https://www.webofscience.com/wos/author/record/ISS-6755-2023, accessed on 20 April 2025	381	105,895	0	0	-	10-Feb
134	3.89	AAY-7514-2020	https://www.webofscience.com/wos/author/record/AAY-7514-2020, accessed on 20 April 2025	2057	77,726	18	278	0.01	10-Feb
134	0.33	JTU-2118-2023	https://www.webofscience.com/wos/author/record/JTU-2118-2023, accessed on 20 April 2025	1261	69,671	1	Not showed	0.00	6-Feb
134	-	AAE-7283-2019	https://www.webofscience.com/wos/author/record/AAE-7283-2019, accessed on 20 April 2025	1285	77,670	0	0	-	4-Feb
134	-	AFC-9624-2022	https://www.webofscience.com/wos/author/record/AFC-9624-2022, accessed on 20 April 2025	810	60,044	0	0	-	10-Feb
133	14.85	A-5514-2010	https://www.webofscience.com/wos/author/record/A-5514-2010, accessed on 20 April 2025	716	96,663	28	561	0.04	2-Feb
132	6.52	ABD-5175-2021	https://www.webofscience.com/wos/author/record/ABD-5175-2021, accessed on 20 April 2025	2551	77,338	37	178	0.01	10-Feb
132	-	P-5373-2014	https://www.webofscience.com/wos/author/record/P-5373-2014, accessed on 20 April 2025	893	67,815	0	0	-	4-Feb
131	3.25	AAY-7644-2020	https://www.webofscience.com/wos/author/record/AAY-7644-2020, accessed on 20 April 2025	1105	88,011	9	546	0.01	10-Feb
131	-	AAV-4844-2020	https://www.webofscience.com/wos/author/record/AAV-4844-2020, accessed on 20 April 2025	935	63,004	0	0	-	2-Feb

Table 2. A comparison of the corrSPR-index and H-index for the top 20 researchers with the highest SPR-index.

corrSPR-Index	H-Index	ID Number	Profile	Numbers of Publications	Sum of Times Cited	Reviews	Average Review Length	Peer Review Metrics	Collection Date (2025)
381.35	82	C-2103-2013	https://www.webofscience.com/wos/author/record/C-2103-2013, accessed on 20 April 2025	368	26,552	667	139	1.81	10-Feb
374.87	73	A-3910-2011	https://www.webofscience.com/wos/author/record/A-3910-2011, accessed on 20 April 2025	271	21,582	572	461	2.11	10-Feb
334.19	56	B-7548-2012	https://www.webofscience.com/wos/author/record/B-7548-2012, accessed on 20 April 2025	203	9815	525	529	2.59	2-Feb
272.18	38	I-1940-2017	https://www.webofscience.com/wos/author/record/I-1940-2017, accessed on 20 April 2025	81	4611	304	322	3.75	4-Feb
235.76	74	M-2918-2014	https://www.webofscience.com/wos/author/record/M-2918-2014, accessed on 20 April 2025	218	23,741	297	512	1.36	2-Feb
224.22	65	CAE-9178-2022	https://www.webofscience.com/wos/author/record/CAE-9178-2022, accessed on 20 April 2025	241	13,554	349	263	1.45	10-Feb
209.47	64	AAD-4840-2019	https://www.webofscience.com/wos/author/record/AAD-4840-2019, accessed on 20 April 2025	346	19,472	446	Not showed	1.29	6-Feb
161.07	101	A-5436-2009	https://www.webofscience.com/wos/author/record/A-5436-2009, accessed on 20 April 2025	461	33,093	276	305	0,60	10-Feb
153.32	76	E-6103-2012	https://www.webofscience.com/wos/author/record/E-6103-2012, accessed on 20 April 2025	510	28,865	380	243	0.75	4-Feb
150.04	76	H-8302-2019	https://www.webofscience.com/wos/author/record/H-8302-2019, accessed on 20 April 2025	819	33,292	555	164	0.68	10-Feb
148.54	51	A-1100-2009	https://www.webofscience.com/wos/author/record/A-1100-2009, accessed on 20 April 2025	140	14,719	190	932	1.36	2-Feb
135.84	43	AFL-9399-2022	https://www.webofscience.com/wos/author/record/AFL-9399-2022, accessed on 20 April 2025	92	7931	148	827	1.61	6-Feb
128.74	86	F-2419-2010	https://www.webofscience.com/wos/author/record/F-2419-2010, accessed on 20 April 2025	244	45,708	153	93	0.63	2-Feb
125.09	71	AAD-4830-2022	https://www.webofscience.com/wos/author/record/AAD-4830-2022, accessed on 20 April 2025	203	19,617	155	516	0.76	6-Feb
124.22	92	AAF-7746-2020	https://www.webofscience.com/wos/author/record/AAF-7746-2020, accessed on 20 April 2025	514	37,018	256	599	0.50	4-Feb
118.68	127	C-8117-2014	https://www.webofscience.com/wos/author/record/C-8117-2014, accessed on 20 April 2025	576	57,265	195	261	0.34	2-Feb
118.41	39	D-9973-2011	https://www.webofscience.com/wos/author/record/D-9973-2011, accessed on 20 April 2025	132	10,466	189	209	1.43	10-Feb
105.93	34	T-7274-2019	https://www.webofscience.com/wos/author/record/T-7274-2019, accessed on 20 April 2025	88	5950	141	405	1.60	4-Feb
102.53	52	P-9421-2019	https://www.webofscience.com/wos/author/record/P-9421-2019, accessed on 20 April 2025	131	38,270	122	476	0.93	10-Feb
101.97	35	K-3871-2012	https://www.webofscience.com/wos/author/record/K-3871-2012, accessed on 20 April 2025	83	13,803	126	981	1.52	5-Feb

Table 3. A comparison of the adjSPR-index, corrSPR-index, and H-index for the top 20 researchers with the highest corrSPR-index, incorporating review length as a secondary correction factor in the SPR-index calculation (data collected on 11 February 2025).

adjSPR-Index	corrSPR-Index	H-Index	ID Number	Profile	Numbers of Publications	Sum of Times Cited	Reviews	Average Review Length *	Peer Review Metrics	Review Length Factor
380.88	380.49	82	C-2103-2013	https://www.webofscience.com/wos/author/record/C-2103-2013, accessed on 20 April 2025	369	26,623	667	139	1.81	0.39
376.15	374.87	73	A-3910-2011	https://www.webofscience.com/wos/author/record/A-3910-2011, accessed on 20 April 2025	271	21,611	572	461	2.11	1.28
336.29	334.83	56	B-7548-2012	https://www.webofscience.com/wos/author/record/B-7548-2012, accessed on 20 April 2025	203	9913	526	529	2.59	1.47
273.07	272.18	38	I-1940-2017	https://www.webofscience.com/wos/author/record/I-1940-2017, accessed on 20 April 2025	81	4654	304	322	3.75	0.89
237.17	235.76	74	M-2918-2014	https://www.webofscience.com/wos/author/record/M-2918-2014, accessed on 20 April 2025	218	23,865	297	512	1.36	1.42
224.94	224.22	65	CAE-9178-2022	https://www.webofscience.com/wos/author/record/CAE-9178-2022, accessed on 20 April 2025	241	13,562	349	263	1.45	0.73
211.63	209.94	64	AAD-4840-2019	https://www.webofscience.com/wos/author/record/AAD-4840-2019, accessed on 20 April 2025	346	19,531	447	612	1.29	1.70
161.91	161.07	101	A-5436-2009	https://www.webofscience.com/wos/author/record/A-5436-2009, accessed on 20 April 2025	461	33,116	276	305	0.60	0.84
151.12	148.54	51	A-1100-2009	https://www.webofscience.com/wos/author/record/A-1100-2009, accessed on 20 April 2025	140	14,808	190	932	1.36	2.58
154.00	153.32	76	E-6103-2012	https://www.webofscience.com/wos/author/record/E-6103-2012, accessed on 20 April 2025	510	29,181	380	243	0.75	0.67
150.49	150.04	76	H-8302-2019	https://www.webofscience.com/wos/author/record/H-8302-2019, accessed on 20 April 2025	819	33,330	555	164	0.68	0.45
138.13	135.84	43	AFL-9399-2022	https://www.webofscience.com/wos/author/record/AFL-9399-2022, accessed on 20 April 2025	92	7948	148	827	1.61	2.29
127.35	125.90	71	AAD-4830-2022	https://www.webofscience.com/wos/author/record/AAD-4830-2022, accessed on 20 April 2025	203	19,637	156	522	0.77	1.45
125.88	124.22	92	AAF-7746-2020	https://www.webofscience.com/wos/author/record/AAF-7746-2020, accessed on 20 April 2025	514	37,059	256	599	0.50	1.66

Table 3. *Cont.*

adjSPR-Index	corrSPR-Index	H-Index	ID Number	Profile	Numbers of Publications	Sum of Times Cited	Reviews	Average Review Length *	Peer Review Metrics	Review Length Factor
129.00	128.74	86	F-2419-2010	https://www.webofscience.com/wos/author/record/F-2419-2010, accessed on 20 April 2025	244	45,881	153	93	0.63	0.26
121.26	120.51	127	C-8117-2014	https://www.webofscience.com/wos/author/record/C-8117-2014, accessed on 20 April 2025	576	57,400	198	270	0.34	0.75
118.99	118.41	39	D-9973-2011	https://www.webofscience.com/wos/author/record/D-9973-2011, accessed on 20 April 2025	132	10,468	189	209	1.43	0.58
104.68	101.97	35	K-3871-2012	https://www.webofscience.com/wos/author/record/K-3871-2012, accessed on 20 April 2025	83	13,854	126	981	1.52	2.72
107.05	105.93	34	T-7274-2019	https://www.webofscience.com/wos/author/record/T-7274-2019, accessed on 20 April 2025	88	5976	141	405	1.60	1.12
103.85	102.53	52	P-9421-2019	https://www.webofscience.com/wos/author/record/P-9421-2019, accessed on 20 April 2025	131	38,322	122	476	0.93	1.32

* 361 words per reviews (averaged from 9,566,437 reviews).

Table 4. The corrSPR-index of 40 researchers with a mid-range H-index (15–25).

corrSPR-Index	H-Index	ID Number	Profile	Numbers of Publications	Sum of Times Cited	Reviews	Average Review Length	Peer Review Metrics	Collection Date (2025)
0.85	15	D-6858-2013	https://www.webofscience.com/wos/author/record/1439470, accessed on 20 April 2025	64	590	2	-	0.03	20-Mar.
2.46	16	K-3606-2013	https://www.webofscience.com/wos/author/record/1738434, accessed on 20 April 2025	57	720	5	320	0.09	20-Mar.
-	16	KVB-8815-2024	https://www.webofscience.com/wos/author/record/59630637, accessed on 20 April 2025	47	666	0		-	20-Mar.
47.04	17	T-2979-2017	https://www.webofscience.com/wos/author/record/668809, accessed on 20 April 2025	48	2080	79	379	1.65	20-Mar.
-	18	D-1175-2013	https://www.webofscience.com/wos/author/record/456552, accessed on 20 April 2025	54	1093	0		-	20-Mar.
5.34	18	AGW-5154-2022	https://www.webofscience.com/wos/author/record/AGW-5154-2022, accessed on 20 April 2025	37	6829	7	462	0.19	21-Mar.
-	18	ABD-5524-2021	https://www.webofscience.com/wos/author/record/ABD-5524-2021, accessed on 20 April 2025	21	7472	0		-	21-Mar.

Table 4. *Cont.*

corrSPR-Index	H-Index	ID Number	Profile	Numbers of Publications	Sum of Times Cited	Reviews	Average Review Length	Peer Review Metrics	Collection Date (2025)
5.34	18	AGW-5154-2022	https://www.webofscience.com/wos/author/record/AGW-5154-2022, accessed on 20 April 2025	37	6829	7	462	0.19	21-Mar.
78.09	19	H-4709-2019	https://www.webofscience.com/wos/author/record/1738434, accessed on 20 April 2025	282	1422	473	173	1.68	20-Mar.
16.76	19	AAK-3803-2021	https://www.webofscience.com/wos/author/record/2249241, accessed on 20 April 2025	35	4277	20	494	0.57	20-Mar.
74.00	19	V-4786-2018	https://www.webofscience.com/wos/author/record/33072113, accessed on 20 April 2025	93	1276	184	228	1.98	20-Mar.
6.39	19	AFM-7562-2022	https://www.webofscience.com/wos/author/record/AFM-7562-2022, accessed on 20 April 2025	19	12,767	5	218	0.26	21-Mar.
-	19	ABI-4713-2020	https://www.webofscience.com/wos/author/record/ABI-4713-2020, accessed on 20 April 2025	86	8139	0		-	21-Mar.
1.10	20	KGL-9175-2024	https://www.webofscience.com/wos/author/record/56004524, accessed on 20 April 2025	112	1291	3	209	0.03	20-Mar.
68.62	20	C-3139-2014	https://www.webofscience.com/wos/author/record/c-3139-2014, accessed on 20 April 2025	130	1309	211	273	1.62	20-Mar.
-	20	L-2148-2013	https://www.webofscience.com/wos/author/record/713766, accessed on 20 April 2025	55	1824	0		-	20-Mar.
1.01	20	T-7076-2019	https://www.webofscience.com/wos/author/record/607074, accessed on 20 April 2025	74	1360	2	211	0.03	20-Mar.
16.54	20	O-5313-2019	https://www.webofscience.com/wos/author/record/O-5313-2019, accessed on 20 April 2025	28	1447	16	1005	0.57	21-Mar.
62.16	20	J-3294-2019	https://www.webofscience.com/wos/author/record/J-3294-2019, accessed on 20 April 2025	34	3579	69	635	2.03	21-Mar.
-	20	Q-5701-2018	https://www.webofscience.com/wos/author/record/Q-5701-2018, accessed on 20 April 2025	46	5883	0		-	21-Mar.
-	21	H-4773-2018	https://www.webofscience.com/wos/author/record/1250414, accessed on 20 April 2025	77	1495	0		-	20-Mar.
0.42	21	D-8152-2011	https://www.webofscience.com/wos/author/record/1540072, accessed on 20 April 2025	100	1400	1	-	0.01	20-Mar.
0.75	21	ABD-5312-2021	https://www.webofscience.com/wos/author/record/ABD-5312-2021, accessed on 20 April 2025	47	3066	1	-	0.02	21-Mar.
-	21	J-8910-2018	https://www.webofscience.com/wos/author/record/J-8910-2018, accessed on 20 April 2025	24	4291	0		-	21-Mar.
-	22	E-3205-2011	https://www.webofscience.com/wos/author/record/826908, accessed on 20 April 2025	87	2663	0		-	20-Mar.
0.64	22	AHC-5682-2022	https://www.webofscience.com/wos/author/record/1325409, accessed on 20 April 2025	61	7032	1	284	0.02	21-Mar.
-	22	ADF-2300-2022	https://www.webofscience.com/wos/author/record/ADF-2300-2022, accessed on 20 April 2025	39	4563	0		-	21-Mar.
-	23	R-2549-2018	https://www.webofscience.com/wos/author/record/1635584, accessed on 20 April 2025	56	7253	0		-	21-Mar.

Table 4. *Cont.*

corrSPR-Index	H-Index	ID Number	Profile	Numbers of Publications	Sum of Times Cited	Reviews	Average Review Length	Peer Review Metrics	Collection Date (2025)
19.95	23	AAN-3268-2020	https://www.webofscience.com/wos/author/record/1998875, accessed on 20 April 2025	62	2810	30	-	0.48	21-Mar.
10.94	23	GXW-2064-2022	https://www.webofscience.com/wos/author/record/34802273, accessed on 20 April 2025	36	2936	11	557	0.31	21-Mar.
-	24	LUY-1510-2024	https://www.webofscience.com/wos/author/record/65899605, accessed on 20 April 2025	51	8656	0		-	20-Mar.
8.97	24	N-5508-2019	https://www.webofscience.com/wos/author/record/1450541, accessed on 20 April 2025	116	2201	21	295	0.18	20-Mar.
1.56	24	ABI-2523-2020	https://www.webofscience.com/wos/author/record/2156943, accessed on 20 April 2025	130	1668	4	-	0.03	20-Mar.
-	24	L-8516-2013	https://www.webofscience.com/wos/author/record/84290, accessed on 20 April 2025	57	2349	0		-	21-Mar.
-	25	GQZ-1894-2022	https://www.webofscience.com/wos/author/record/65899605, accessed on 20 April 2025	58	2294	0		-	20-Mar.
-	25	A-1694-2010	https://www.webofscience.com/wos/author/record/226927, accessed on 20 April 2025	59	3143	0		-	20-Mar.
-	25	D-5530-2014	https://www.webofscience.com/wos/author/record/798206, accessed on 20 April 2025	107	2426	0		-	20-Mar.
39.11	25	ABI-7748-2020	https://www.webofscience.com/wos/author/record/1498200, accessed on 20 April 2025	33	4833	34	316	1.03	21-Mar.
28.04	25	AFP-8018-2022	https://www.webofscience.com/wos/author/record/1744536, accessed on 20 April 2025	40	7278	28	1426	0.70	21-Mar.
47.16	25	AFU-9688-2022	https://www.webofscience.com/wos/author/record/881370, accessed on 20 April 2025	68	3699	70	288	1.03	21-Mar.

2.3. SPR-Index Calculation

To combine scientific impact and peer review engagement into a single composite metric, we define the SPR-index as the product of a researcher's normalized H-index and the number of reviews conducted:

$$\text{SPR-index} = (\text{H-index}/P) \times R \tag{2}$$

This formulation eliminates the need to estimate the number of peer review invitations (C) while still capturing the balance between research output and peer review activity. Normalizing the H-index by the number of publications (H/P) accounts for the size of a researcher's publication record, ensuring the metric reflects impact relative to output. When multiplied by R, the result highlights both high-impact research and meaningful engagement in the peer review system.

2.4. Correction Factor and Definition of the corrSPR-Index

To address potential imbalances in the original SPR-index—particularly between researchers with low publication counts but high peer review activity, and those with higher publication outputs and moderate review activity—we propose an adjusted version of the metric, referred to as the corrSPR-index (corrected Scientific Peer Review Index).

This revised formulation introduces a logarithmic scaling factor based on the number of publications, intended to moderate the potential overvaluation of reviewers with very few authored papers. The rationale is that publication output tends to increase nonlinearly over the course of a research career; thus, a logarithmic transformation provides a more proportional adjustment when comparing individuals at different stages.

The corrected metric is defined as follows:

$$\text{corrSPR-index} = (H/P) \times R \times \log(P) \tag{3}$$

where the following applies:

H is the researcher's H-index;

P is the total number of publications authored;

R is the total number of peer reviews conducted;

$\log(P)$ is the logarithm of the number of publications.

This adjusted version retains the original goal of integrating scientific impact (via the H-index) with peer review engagement while reducing excessive sensitivity to low publication counts.

2.5. The Inclusion of Review Length as a Second Correction Factor

To further enhance the corrSPR-index, we propose incorporating review length as an additional correction factor. This adjustment aims to acknowledge the depth and effort involved in a researcher's peer review activity under the assumption that longer reviews often reflect more detailed feedback and greater engagement.

We introduce the Review Length Factor, calculated as the ratio between a researcher's average review length and the global average review length. Specifically, the following applies:

L_r is the researcher's average review length (in words);

L_a is the global average review length, calculated from the full dataset.

The Review Length Factor is defined as follows:

$$\text{Review Length Factor} = L_r/L_a \tag{4}$$

This value is then added to the corrSPR-index, resulting in the final adjusted metric:

$$\text{adjSPR-index} = \text{corrSPR-index} + \text{Review Length Factor} \quad (5)$$

This refinement ensures that the adjSPR-index captures not only the volume of peer review contributions but also acts as a proxy for their level of detail and critical analysis. Importantly, by treating this correction as an additive rather than a multiplicative factor, the model avoids excessive weighting while still valuing meaningful engagement in the peer review process.

2.6. Statistical Analysis

To ensure statistical validity, we determined the minimum required sample size for a finite population using standard sample size estimation methods (Cochran, 1977). Assuming a total population of 6886 highly cited researchers (based on 2024 Clarivate data), a 95% confidence level ($Z = 1.96$), an assumed population proportion of 0.5 (maximizing variability), and a 5% margin of error (0.05), the calculated minimum sample size was 364 researchers. Our dataset, comprising 690 researchers (approximately 10% of the total population), exceeds this threshold, ensuring statistical representativeness at a 95% confidence level.

The relationship between the corrSPR-index and the traditional H-index was evaluated using both parametric and non-parametric statistical methods. Initially, the distribution of both variables was assessed through descriptive statistics, histograms, and Q-Q plots. Formal tests for normality included the Shapiro–Wilk, Jarques–Bera and Lilliefors tests, applied to both the H-index and the corrSPR-index. Subsequently, multiple statistical approaches were applied: (i) Pearson's correlation coefficient (r): to assess the strength and direction of the linear relationship between the indices under the assumption of normality; (ii) Spearman's rank correlation coefficient (ρ): to assess potential nonlinear relationships and ensure robustness against deviations from normality; and (iii) Linear regression analysis: modeling the corrSPR-index as a predictor variable and the H-index as the outcome variable to evaluate the predictive power of the corrSPR-index. Model residuals were also evaluated to ensure compliance with linear regression assumptions (normality, homoscedasticity, and linearity), using visual inspection via histograms and Q-Q plots, as well as the Shapiro–Wilk test.

To identify potential researcher profiles, a K-means clustering algorithm was employed to classify researchers based on their corrSPR-index and H-index values. The optimal number of clusters was empirically determined to be two. Cluster centroids were computed to characterize distinct researcher profiles, and silhouette coefficient analysis was used to assess clustering quality, revealing different academic contribution patterns beyond traditional citation metrics.

To further investigate the multidimensional relationships among bibliometric and peer review indicators, a principal component analysis (PCA) was performed using six standardized variables: the H-index, corrSPR-index, number of publications, total citations, number of peer reviews, and composite peer review metric. This approach enabled the visualization of researcher distribution and variable loadings in a reduced dimensional space.

All statistical analyses and visualizations were performed using R (version 4.4.2; R Core Team, 2024). Correlation and regression analyses were conducted with the stats package. Normality tests included the Shapiro–Wilk test (shapiro.test from the stats package), the Jarque–Bera test (from the tseries package), and the Lilliefors test (from the nortest package). Hierarchical clustering was performed using the cluster package, and data visualization was generated with ggplot2 (Wickham, 2016).

3. Results

Using data from Table S1, we compiled Table 1, which presents the top 40 researchers with the highest H-index among the 690 individuals whose data were collected from Web of Science. While these researchers exhibit substantial academic impact, as reflected by their citation counts, most participate in relatively few peer reviews. This pattern suggests that a high H-index does not necessarily correspond to active engagement in the peer review process. Furthermore, the data revealed a nonlinear relationship between researchers' H-index and their peer review activity (Figure 1).

The trend line, displayed with a 95% confidence interval, showed considerable variability and no clear directional pattern. This finding underscores the limitations of traditional bibliometric indicators in capturing researcher's engagement in peer review and highlights the need to re-examine existing metrics to more accurately recognize and incentivize this essential scholarly contribution.

The distribution of peer reviews across different H-index groups reveals substantial variability in peer review activity among researchers. In particular, researchers within the H-index range of 151–250 display notable inconsistency in their peer review contributions, with some demonstrating substantial activity while others contribute minimally or not at all (Figure 2). Notably, several researchers at the upper end of this range (H-index > 175) exhibit limited engagement despite their higher academic standing (Table S1). Compared to the researchers listed in Table 1, those with the highest H-index values (e.g., 190–205; see Table S1) tend to show disproportionately lower peer review activity, suggesting a potential inverse relationship between a very high H-index and peer review engagement.

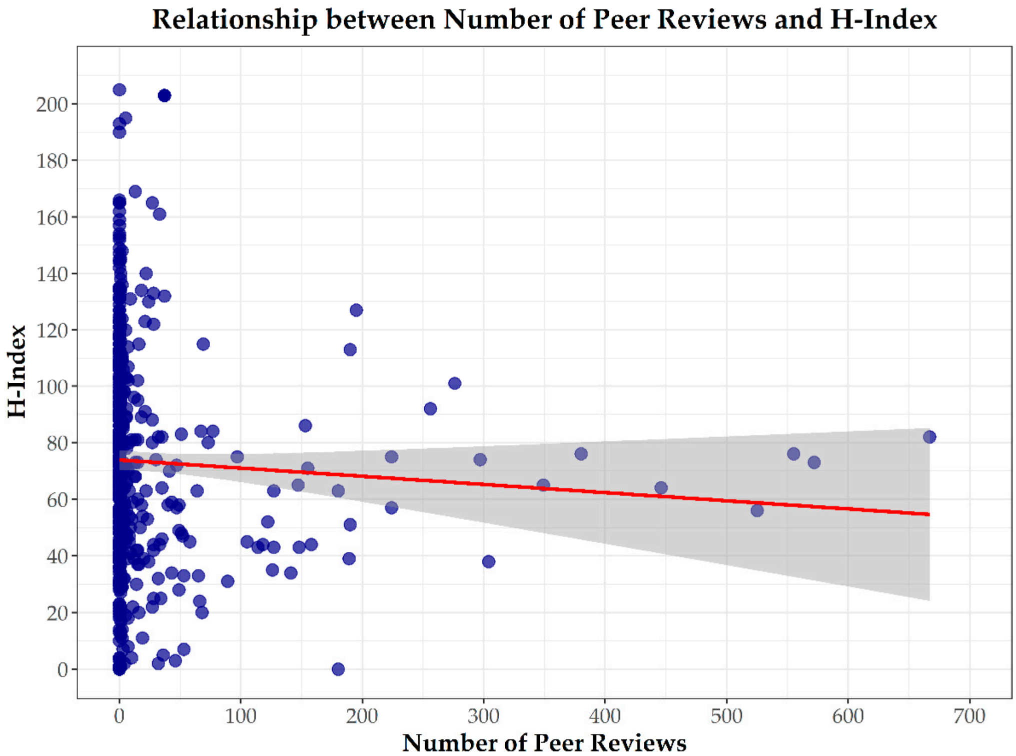

Figure 1. The relationship between the H-index and number of peer reviews. The scatter plot illustrates the relationship between researchers' H-index and the number of peer reviews they have conducted. Each point represents an individual researcher (n = 517, researchers with available peer review profiles; see Table S1 for details). The solid line represents the linear regression trend, and the shaded area corresponds to the 95% confidence interval. The plot reveals that researchers with higher H-index values tend to conduct fewer peer reviews.

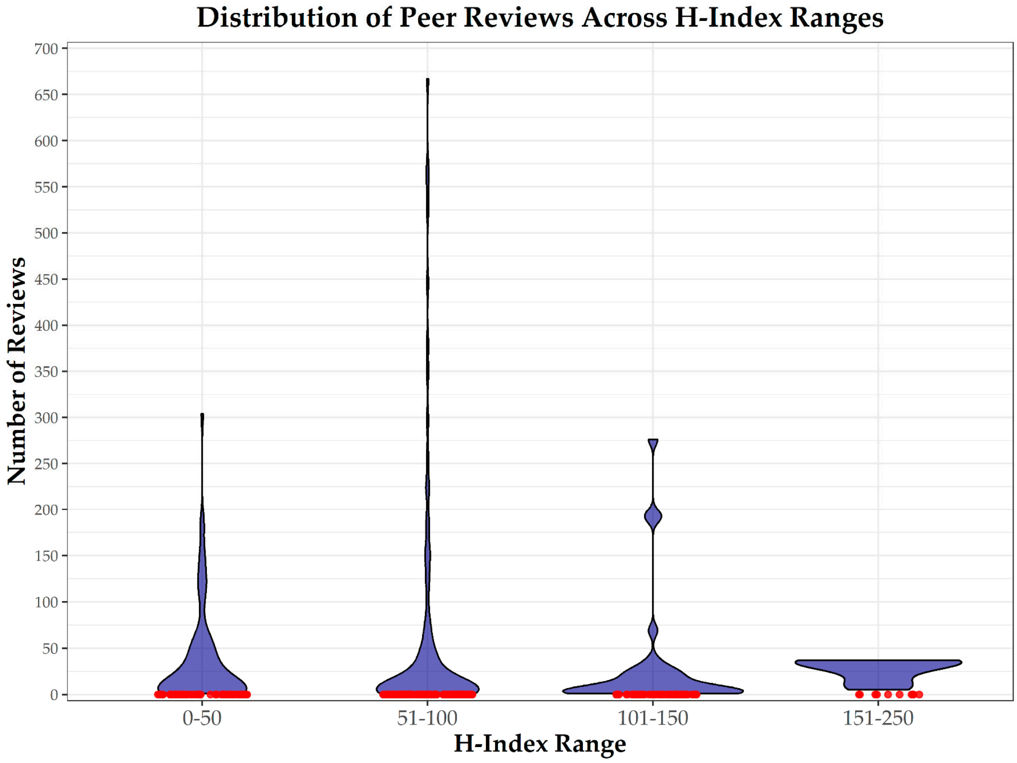

Figure 2. The distribution of peer reviews by the H-index group. The violin plot displays the number of peer reviews conducted across researcher groups categorized by their H-index, with zero-review cases represented as red points. The data are based on Table S1 (n = 517 researchers), illustrating the variability in peer review activity, particularly among researchers with the highest H-index scores. Group sizes: 0–50 (n = 150), 51–100 (n = 255), 101–150 (n = 93), and 151–250 (n = 19).

In contrast, Table 2 presents the top 20 researchers ranked by their corrSPR-index, which prioritizes the number of peer reviews conducted rather than solely reflecting citation impact, as measured by the H-index. Notably, none of the researchers from Table 1 appear in Table 2, indicating that the most frequently cited researchers do not necessarily contribute the most to peer review activities. Additionally, the corrSPR-index generally produces higher values than the H-index, emphasizing its effectiveness in recognizing researchers' peer review contributions—an essential yet often underappreciated aspect of academic engagement (Figure 3). To provide a complementary perspective, we also present the data sorted by the H-index (Figure S1). This approach enables a direct comparison between conventional citation-based impact and peer review engagement, revealing notable discrepancies between the two metrics and reinforcing the distinctiveness of the corrSPR-index.

Prior to applying parametric methods, the distribution of the corrSPR-index and H-index was evaluated. The H-index exhibit no significant deviation from normality according to the Shapiro–Wilk test (W = 0.950, p = 0.367), the Jarque–Bera test (χ^2 = 1.14, p = 0.566), and the Lilliefors test (D = 0.101, p = 0.853). In contrast, the corrSPR-index showed signs of non-normality based on the Shapiro–Wilk test (W = 0.813, p = 0.001) and the Lilliefors test (D = 0.256, p = 0.001), although the Jarque–Bera test did not reject the null hypothesis (χ^2 = 4.23, p = 0.120), suggesting a mild departure from a normal distribution. These results were supported by a visual inspection of histograms and Q–Q plots (Figures S2 and S3), which indicated symmetry and normality for the H-index and moderate asymmetry and heavy tails for the corrSPR-index.

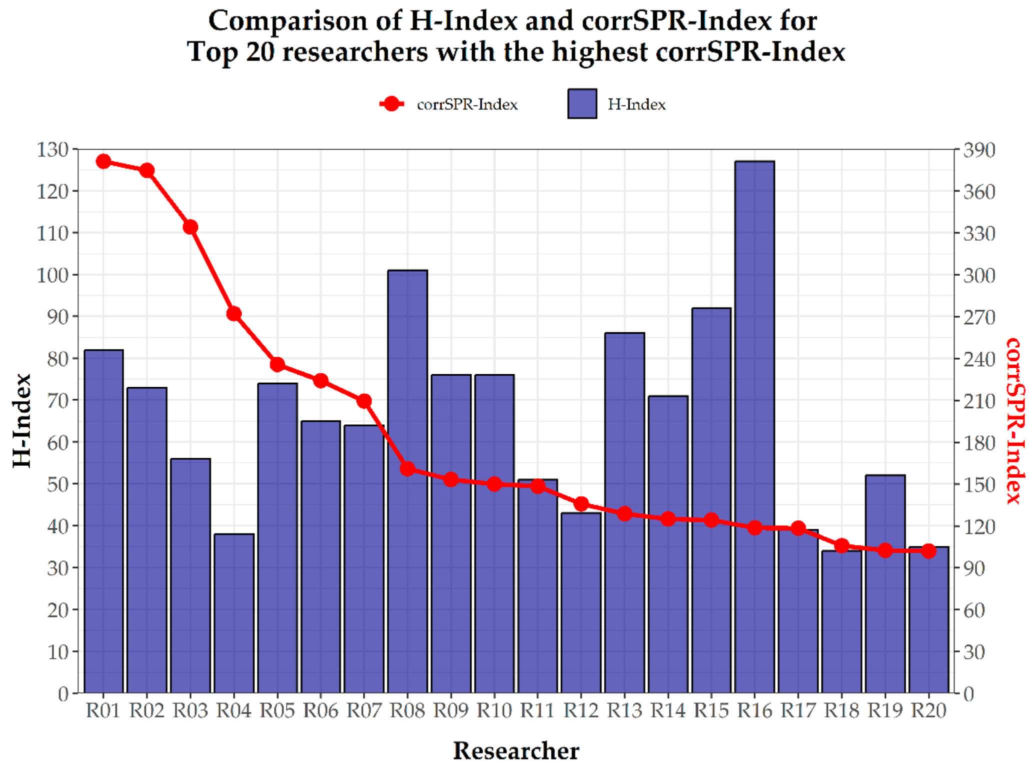

Figure 3. A comparison of the H-index and corrSPR-index for the top 20 researchers. The figure compares the H-index (blue bars) and the corrSPR-index (red line and points) for a group of top researchers. The H-index reflects citation-based impact, while the corrSPR-index incorporates peer review contributions.

Based on these diagnostics, both parametric and non-parametric correlation methods were applied. Statistical analysis revealed no significant relationship between the corrSPR-index and the traditional H-index. Pearson's correlation coefficient indicated a weak, non-significant association ($r = 0.049$, $p = 0.838$), while Spearman's rank correlation coefficient suggested a slightly stronger but still non-significant association ($\rho = 0.246$, $p = 0.296$). These results suggest the relationship between the two indices is weak and neither clearly linear nor nonlinear. Linear regression analysis further supported these findings, showing very low explanatory power ($R^2 = 0.0024$, $p = 0.838$; Figure 4). The resulting regression equation, H-index = 64.32 + 0.0131 × corrSPR-index, indicates that changes in the corrSPR-index do not significantly predict variations in the H-index.

The residuals from the linear regression model were tested for normality using the Shapiro–Wilk test ($W = 0.9445$, $p = 0.291$), which did not indicate significant deviation from a normal distribution. This result was supported by a visual inspection of the Q–Q plot and histogram of residuals (Figure S4), both of which showed no substantial deviations from normality. Together, these findings confirm that the distribution of residuals satisfies the normality assumption required for the application of linear regression.

K-means clustering analysis identified two distinct researcher profiles, with centroids located at (corrSPR-index = 146.96, H-index = 67.88) and (corrSPR-index = 340.65, H-index = 62.25), respectively (Figure 5). The silhouette coefficient of 0.647 indicates a well-defined clustering structure. These findings suggest two distinct researcher profiles: one group characterized by a high corrSPR-index but moderate H-index values and another group with an intermediate corrSPR-index and slightly higher H-index. This differentiation reinforces the idea that the corrSPR-index captures dimensions of academic contribution not reflected by traditional citation-based metrics like the H-index.

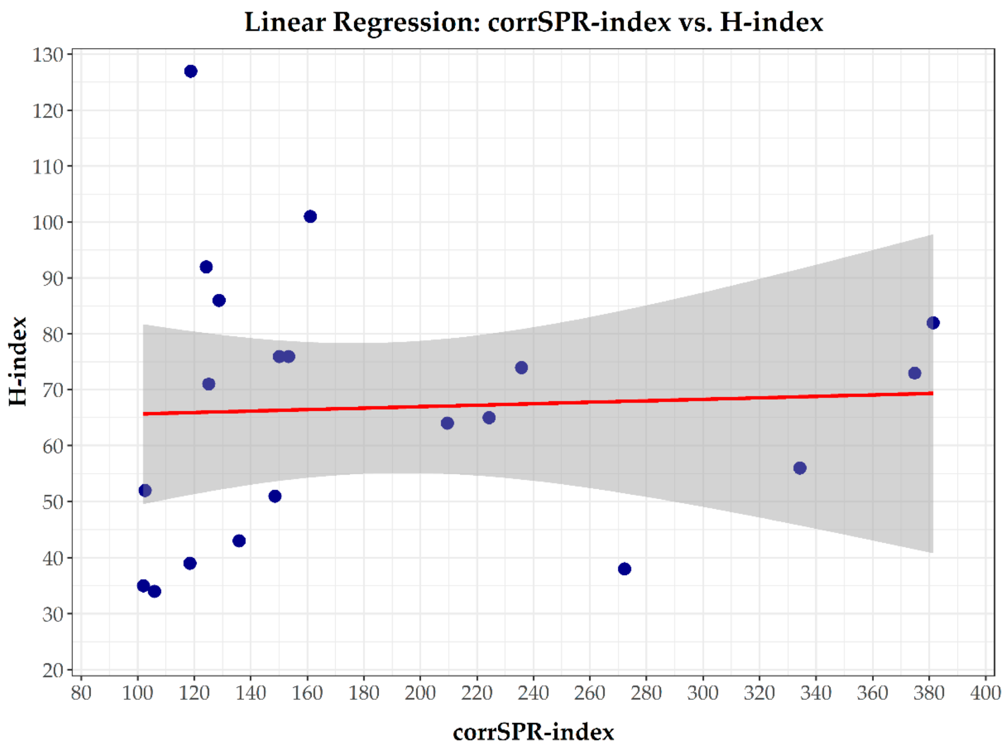

Figure 4. A linear regression model assessing the relationship between the corrSPR-index and the H-index. Each dot represents an individual researcher. The red line represents the fitted regression line, while the shaded area denotes the 95% confidence interval.

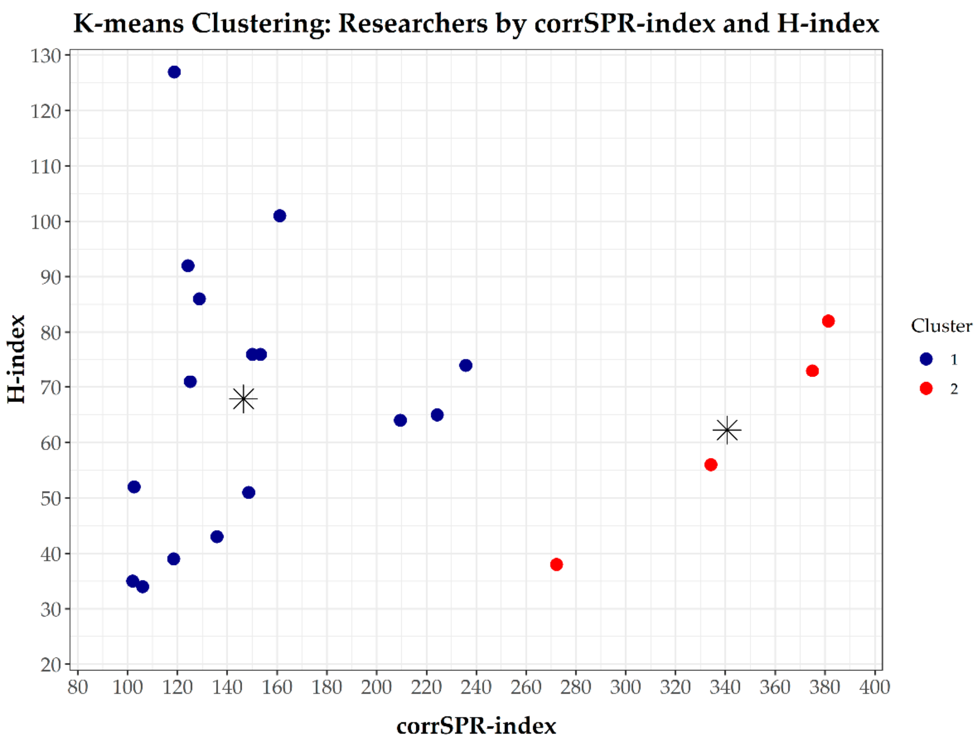

Figure 5. A K-means clustering of researchers based on corrSPR-index and H-index. The scatter plot visualizes the results of the K-means clustering analysis, classifying researchers into two distinct groups based on their corrSPR-index and H-index values. Each point represents an individual researcher, color-coded according to cluster membership. The centroids of each cluster are indicated by an * symbol.

The principal component analysis revealed that the first two principal components accounted for a substantial proportion of the total variance—52.9% for the first component and 35.9% for the second, summing to 88.8% overall (Figure 6). This indicates that the majority of variation among the six metrics can be effectively captured within a two-dimensional space.

The resulting biplot (Figure 6) showed a clear separation between variables associated with traditional bibliometric impact (the H-index, number of publications, and total citations) and those related to peer review activity (the corrSPR-index, number of reviews, and peer review metric). The loading vectors of the peer review variables were predominantly aligned with principal component 2, whereas publication- and citation-based metrics contributed more strongly to principal component 1. This divergence suggests that peer review engagement represents a distinct dimension of scholarly activity, not adequately captured by conventional citation-based metrics.

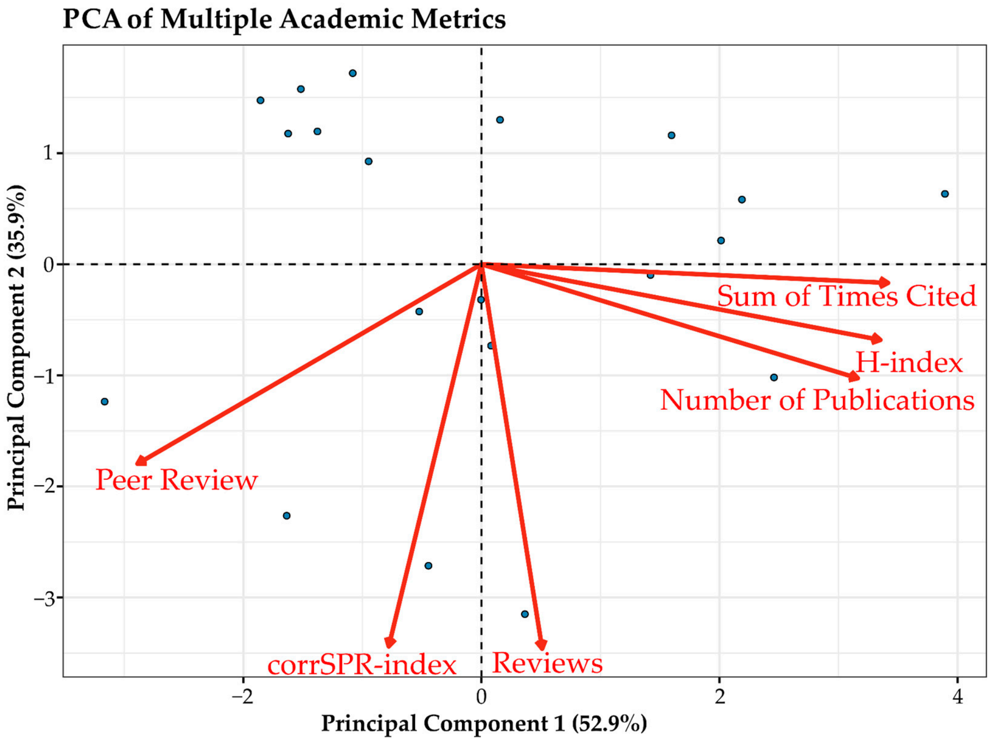

Figure 6. A principal component analysis (PCA) biplot showing the distribution of researchers (points) and the loadings of six standardized variables (arrows): the H-index, corrSPR-index, number of publications, total citations, number of peer reviews, and composite peer review metric. Each dot represents an individual researcher. The arrows indicate the direction and magnitude of each variable's contribution to the principal components.

In Table 3, a second correction factor was introduced to further refine the corrSPR-index by incorporating the average length of peer reviews conducted by each researcher. This correction factor was calculated by comparing individual review word counts to the overall average derived from 9,566,437 reviews (Web of Science data). Reviewers who consistently produced shorter-than-average reviews received a slight penalty, whereas those who authored more detailed reviews either maintained or slightly improved their rankings. Despite this adjustment, the overall ranking remained largely unchanged compared to Table 2, suggesting that the corrSPR-index remains a stable and robust metric (Figure 7). This refinement also encourages researchers to provide more comprehensive and in-depth evaluations, ensuring that peer review contributions are not only frequent but also meaningful—enhancing the quality and rigor of academic discourse.

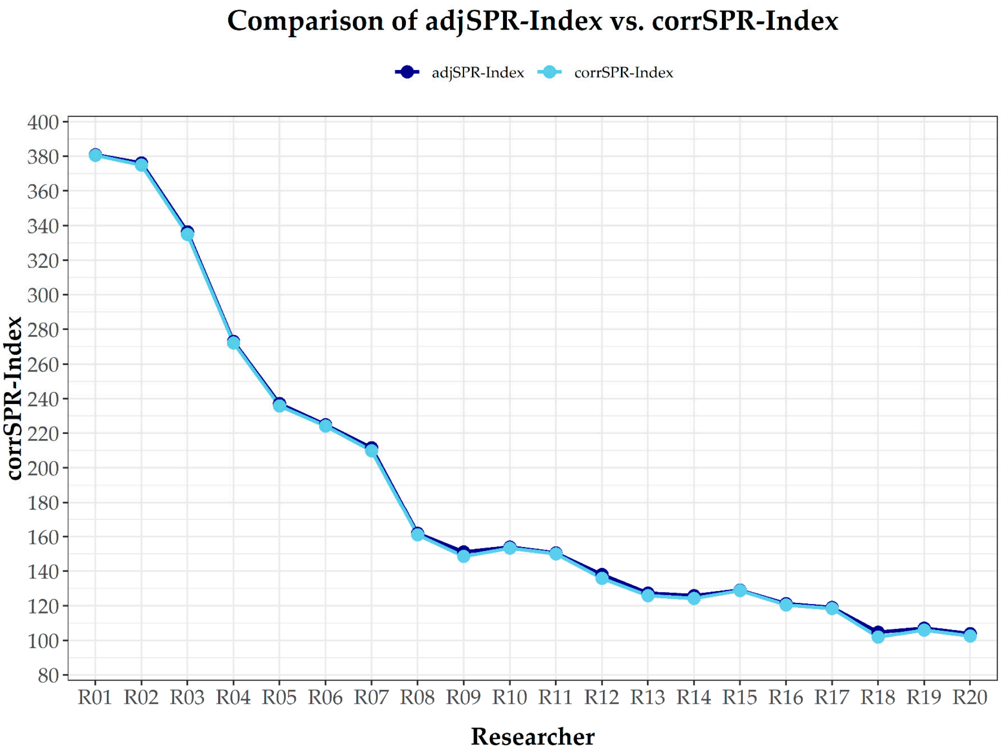

Figure 7. A comparison of the adjSPR-index vs. the corrSPR-index. This figure compares the adjSPR-index (dark blue) and the corrSPR-index (sky blue) across different researchers. The adjSPR-index incorporates a correction factor accounting for the length of peer reviews, while the corrSPR-index reflects the unadjusted metric.

Table S2 presents a list of 19 researchers who, despite having an H-index of zero or at most eight, were classified as highly cited researchers. This discrepancy highlights a critical flaw in Clarivate's data compilation and validation processes, suggesting a failure to accurately assess research impact. Equally concerning is the presence of highly cited researchers lacking a Web of Science profile (marked as 'Claim Profile' in Table S3), totaling 173 researchers (25.82%) out of the 670 surveyed in this study. These inconsistencies underscore potential limitations in Clarivate's current methodology.

Additionally, we compared the corrSPR-index of 40 researchers with a mid-range H-index (15–25) (Table 4) to that of the top 40 most-cited researchers from the 690 surveyed (Table 1) to explore potential differences in research impact. Constructing Table 4 posed challenges, as 52.94% (45/85) of the mid-range H-index researchers with Web of Science profiles reviewed were labeled 'Claim Profile,' hindering data collection (Table S4). When comparing the researchers in Table 1 to those in Table 4, we found that, in both cases, few researchers actively engage in peer review work. However, for those who do participate in peer review, the corrSPR-index tends to yield higher values than the H-index, highlighting its ability to capture a different dimension of academic contribution.

4. Discussion

One of the primary limitations of the H-index, as highlighted in this study, is its heavy reliance on citation counts as a measure of research impact. Citation counts can be influenced by various factors, such as disciplinary citation practices, self-citations, and the age of publications, which may introduce biases and inaccuracies when comparing researchers across diverse fields (Hirsch, 2005; Waltman, 2016). Moreover, the H-index does not account for the quality or significance of publications, as it focuses solely on citation frequency. This limitation hinders its ability to capture other critical aspects of academic contributions, including researchers' influence beyond academia, participation in collaborative projects, or engagement in peer review activities (Bornmann & Daniel, 2007; Moed, 2017). Additionally, citation patterns vary significantly across disciplines, with some fields naturally accumulating citations more rapidly than others. Consequently, the H-index may disadvantage researchers in disciplines with inherently lower citation rates, rendering it an incomplete metric for comprehensive academic evaluation (Ruiz-Castillo & Waltman, 2015).

The need for alternative metrics to address these shortcomings has spurred the development of indices such as the corrSPR-index, proposed in this study. The adjSPR-index aims to provide a more holistic assessment by incorporating not only the number of publications and citation frequency but also verified peer reviews and, potentially, the length of those reviews. These additional factors offer a broader perspective on researchers' contributions, engagement, and depth of involvement in the scholarly community (Gingras, 2016; Wouters et al., 2019). While the H-index remains widely used, ongoing discussions and refinements of evaluation metrics are essential to ensure fair and comprehensive assessments of research impact. The adjSPR-index represents a step forward in this direction; however, further research and validation are required to establish it as a reliable and widely adopted metric (Kamrani et al., 2021).

The corrSPR-index has the potential to revolutionize science by recognizing researchers who actively contribute to peer review. When analyzing researchers with a high corrSPR-index, we observe that only a few contribute substantially. However, unlike the H-index, which does not account for peer review, the corrSPR-index appropriately rewards these contributions. Our analysis revealed no significant relationship between the corrSPR-index and the H-index. The weak and non-significant correlations, coupled with the low explanatory power of the regression model, indicate that the corrSPR-index does not directly predict variations in the H-index. However, the well-defined clustering structure suggests the presence of distinct researcher profiles, underscoring that the corrSPR-index captures a complementary aspect of scholarly impact, particularly in the context of peer review contributions. These findings reinforce the notion that the corrSPR-index represents a distinct dimension of academic performance that is not strongly associated with citation-based metrics such as the H-index, thereby emphasizing the need for alternative bibliometric indicators to assess broader aspects of scientific engagement.

Despite the potential advantages of the corrSPR-index, our analysis revealed significant inconsistencies in the Highly Cited Researchers list. Approximately 25% (173/690) of the profiles were marked as "Claim Profile," indicating that these researchers do not actively manage or engage with their citation records. This percentage is even higher among those with a mid-range H-index (15–25), reaching 52.94% (45/85; Table S4), which imposes notable limitations on the model presented here. Additionally, we identified critical errors in the list, including incorrect researcher links, name mismatches, and the inclusion of individuals with only a single publication or an H-index of zero—who should not qualify for inclusion. These findings highlight major flaws in the database's data curation process, underscoring the need for more rigorous verification and quality control (Ioannidis et al., 2014). Furthermore, these inaccuracies impose limitations on the corrSPR-index, as it relies on potentially flawed or imprecise data. Another challenge is the lack of a standardized word count for reviewer comments, complicating efforts to establish a meaningful baseline. Due to these limitations, the corresponding data could not be included in Table S1. These issues emphasize the urgent need for a more stringent approach to ensuring data accuracy and improving review processes, which may extend beyond the database used in this study. Addressing these concerns could enhance the reliability of researcher impact assessments (Tennant & Ross-Hellauer, 2020). These inconsistencies in researcher records not only highlight flaws in data management but also raise questions about the engagement of highly cited researchers in fundamental academic responsibilities, such as peer review.

Our results align with previous studies that challenge the reliance on single bibliometric measures to comprehensively evaluate scholarly impact. Khurana and Sharma (2022) argue that ranking methodologies based solely on the H-index may systematically undervalue the contributions of early-career and lower-ranked researchers, whose academic influence might not yet be fully reflected in citation-based metrics. They emphasize that alternative indices, such as modifications of the H-index, can better account for the early-stage impact of researchers, thereby promoting a more equitable ranking system within a discipline.

Furthermore, the well-defined clustering structure observed in our study reinforces the notion that academic performance is inherently multidimensional, shaped by factors beyond citation accumulation. Ameer and Afzal (2019) demonstrate that while both quantitative and qualitative bibliometric indices offer valuable insights, no single metric is sufficient for consistently identifying top-performing researchers, particularly in the neuroscience domain. Their analysis reveals that even the most effective indices, such as the hg-index and R-index, fail to rank at least 60% of award-winning researchers within the top 10% of their respective ranked lists. This limitation underscores the inherent challenges of relying on any single metric to comprehensively capture scholarly excellence, highlighting the need for a more integrative approach that considers diverse dimensions of academic contribution.

In line with this perspective, growing attention over the past decade has been directed toward the limitations of the H-index, leading to the proposal of more refined and robust bibliometric indicators. Among these, the success index introduced by Franceschini et al. (2012) stands out for its ability to normalize citation impact across scientific fields and its suitability for evaluating interdisciplinary or institutionally diverse publication sets. By using a reference sample rather than bibliographic references alone to estimate the propensity to cite, the success index avoids key statistical weaknesses and reduces the risk of metric manipulation. In a critical reassessment of the H-Index, Koltun and Hafner (2021) argued that it no longer provides a reliable proxy for scientific reputation. They highlighted its susceptibility to self-citation and promotion strategies, as well as its inability to differentiate between the quantity and quality of research output. Their large-scale analysis further demonstrated that emerging authorship patterns, such as hyperauthorship, have significantly contributed to the metric's declining effectiveness. Similarly, Ding et al. (2020) reinforced that no single metric is universally reliable and emphasized the need for contextualized and multidimensional evaluation practices. They stressed that bibliometric indicators should be complemented by peer review and social impact assessments and that author influence must consider the diversity of citation sources, not just their frequency.

Taken together, these findings underscore the challenges of relying on a single metric to evaluate academic performance. They reaffirm the importance of adopting a more holistic and balanced approach that considers various dimensions of research influence—including contributions to peer review, interdisciplinary collaborations, and mentorship. By integrating these factors, academic assessment can become more equitable and provide a more comprehensive measure of scholarly impact.

Another concerning issue is that many highly cited researchers do not actively contribute to the peer review system. While they publish extensively and receive significant citations, they either abstain from peer review activities, do not claim their reviews, or fail to enable the option to display their review history in Clarivate. This lack of engagement raises concerns about the equitable distribution of responsibilities within the academic ecosystem. A select group benefits from high status, funding, recognition, and career advancement opportunities—including positions at leading global institutions—while contributing little to the system that upholds research integrity (Costas & van Leeuwen, 2012; Smith, 2006; Teixeira da Silva & Dobránszki, 2015).

The reluctance of researchers to review manuscripts submitted to scientific journals—particularly paid open-access journals—presents additional challenges for the peer review system. This trend inadvertently shifts the burden onto those who remain committed to reviewing, regardless of the journal type. The resulting imbalance in review workload not only affects the efficiency of the evaluation process but also raises concerns about potential biases in research assessment. Addressing this issue requires broader systemic changes; however, immediate efforts should focus on alleviating the burden on dedicated reviewers and ensuring the sustainability of the peer review system during this transitional period (Ross-Hellauer, 2017; Tennant et al., 2017).

As proposed in this study, the corrSPR-index could incentivize researchers to acknowledge and value peer review efforts by actively recording and claiming their reviews. Moreover, this highlights the need for Clarivate to implement stricter data collection and verification measures before publishing such a prestigious list. By explicitly recognizing and quantifying peer review efforts, the corrSPR-index provides a valuable tool for fostering a more sustainable peer review system, ensuring that essential academic contributions receive the acknowledgment they deserve. Ensuring that peer review contributions are transparently documented and integrated into researcher evaluations is critical for fostering a fairer and more sustainable academic system (Bornmann, 2011; Haustein & Larivière, 2015).

5. Conclusions

The corrSPR-index, introduced as an enhancement to the H-index, offers a more comprehensive framework for researcher evaluation by integrating normalized publication impact with their verified peer review contributions. By incorporating review length, the adjSPR-index acknowledges both the depth of engagement and the intellectual effort invested in the review process, addressing a critical gap in traditional bibliometric indices. While this metric represents a step toward a more holistic assessment of research impact, its widespread adoption requires further validation through empirical studies, cross-disciplinary testing, and the refinement of data collection methodologies. Additionally, addressing inconsistencies in citation databases and standardizing peer review documentation will be essential to ensuring the corrSPR-index's reliability and effectiveness in academic evaluations. However, for those who do participate in peer review, the corrSPR-index tends to yield higher values than the H-index, highlighting its ability to capture a different dimension of academic contribution.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/publications13020022/s1, Figure S1. Comparison of corrSPR-index (bars) and H-index (line) for 20 researchers; Figure S2. A histogram and Q–Q plot illustrating the distribution of H-index values; Figure S3. A histogram and Q–Q plot showing the distribution of the corrSPR-index; Figure S4. A histogram and Q–Q plot of the residuals from the linear regression model; Table S1: Highly cited researchers from Web of Science; Table S2: Data compilation errors in Web of Science among 690 highly cited researchers; Table S3: list of highly cited researchers without a profile on Web of Science (Displayed as "Claim Profile"); Table S4: The availability of Web of Science profiles for researchers with a mid-range H-index (15–25).

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Abbreviations

The following abbreviations are used in this manuscript:

SPR-index	Scientific Peer Review Index
H-index	Hirsch index
IF	Impact factor
NP	Number of publications

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