$h$-index: Assessing a researcher’s impact

2015 Scholar’s Cooperative Brown Bag Series

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Schildman Medical Library
What is the $h$-index?

A combined measure of researcher productivity (# of publications) and impact (# of citations)

Created in 2005 by physicist Jorge E. Hirsch (UCSD)

What is the $h$-index?

An $h$-index of $h$ means that an author’s $h$ most highly cited articles have at least $h$ citations each.

The 6 most highly-cited articles have been cited at least 6 times each.
The *$h$*-index assesses researchers

<table>
<thead>
<tr>
<th>ITEM</th>
<th>METRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>journal article</td>
<td>citations (and altmetrics)</td>
</tr>
<tr>
<td>journal</td>
<td>impact factor</td>
</tr>
<tr>
<td>researcher</td>
<td><em>$h$</em>-index</td>
</tr>
</tbody>
</table>
Advantages of $h$-index

- **Informative**: more informative than # of publications or # of citations

- **Simple**: easy to calculate and understand

- **Robust**: insensitive to “one-hit wonders” or an excess of uncited papers—as rewards researchers who consistently publish influential work
Disadvantages of $h$-index

- **Simple**: ignores other aspects of research impact

- **Cannot decrease**: researchers can maintain a good $h$-index even if they cease to be productive

- **Gameable**: can be inflated by self-citation (5-25%)

- **Relative**: depends on discipline, length of research career, number of co-authors, etc.
Alternatives to $h$-index

$g$-index: accounts for highly cited articles
contemporary $h$-index: accounts for recency of articles
individual $h$-index: accounts for co-authors
$m$-quotient: accounts for career length

$a$-index, $ar$-index, $e$-index, $c$-index, $h’$-index, $h(2)$-index, $h_f$-index, $h_T$-index, $h_w$-index, HCP indicator, $i10$-index, $IQp$-index, maxprod index, $p$-index, $\pi$-index, $r$-index, $s$-index, success-index, $t$-index, $w$-index
$k$-index

Ratio of Twitter followers ("celebrity") to citations ("scientific value")

$k$-index $\geq 5$: overblown public profile

Tools for calculating $h$-index

Web of Science
Scopus
Google Scholar

Publish or Perish software
(http://www.harzing.com/pop.htm)

$h$-index prediction tool
(http://klab.smpp.northwestern.edu/h-index.html)
Web of Science

Basic Search

Akers KG

Author

TIMESPAN

All years

From 1900 to 2015

MORE SETTINGS
Web of Science
Web of Science

Published Items in Each Year

Citations in Each Year

Results found: 44
Sum of the Times Cited: 729
Sum of Times Cited without self-citations: 490
Citing Articles: 380
Citing Articles without self-citations: 365
Average Citations per Article: 3.86

H-index: 14

Sort by: Times Cited - highest to lowest

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<tr>
<th>Year</th>
<th>Total</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Average Citations per Year</th>
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<td>9</td>
<td>11</td>
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<td>5</td>
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1. Programming social, cognitive, and neuroendocrine development by early exposure to novelty
   - By: Tang, Akaysha C.; Akers, Katherine G.; Reeb, Bethany C.; et al.

2. Posttraining Ablation of Adult-Generated Neurons Degrades Previously Acquired Memories
   - By: Amada-Carvalho, Mathie; Sakkapich, Mosanari; Akers, Katherine G.; et al.
   - JOURNAL OF NEUROSCIENCE, Volume 31, Issue 42, Pages: 15113-15127, Published: OCT 19 2011

3. How do room and apparatus cues control navigation in the Morris water task? Evidence for distinct contributions to a movement vector
   - By: Hamilton, Derek A.; Akers, Katherine G.; Weisend, Michael P.; et al.
   - JOURNAL OF EXPERIMENTAL PSYCHOLOGY-ANIMAL BEHAVIOR PROCESSES, Volume 33, Issue 2, Pages: 100-114, Published: APR 2007

4. The relative influence of place and direction in the Morris water task
<table>
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<td>Effect of high-frequency stimulation of the perforant path on previously acquired spatial memory in rats: Influence of memory strength and reactivation</td>
<td>Akers, K.G., Hamilton, D.A.</td>
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Scopus

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<td>Fetal alcohol exposure leads to ab...</td>
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<td>Effects of exposure to moderate la...</td>
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<tr>
<td>19</td>
<td>12</td>
<td>Comparison of developmental traj...</td>
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</tbody>
</table>

This author's h-index is 15

The h-index is based upon the number of documents and number of citations.

Note: Scopus is in progress of updating pre-1996 cited references going back to 1970. The h-index might not be fully accurate.
Scopus

This author's h-index is 15

The h-index is based upon the number of documents and number of citations.

Note: Scopus is in progress of updating pre-1996 cited references going back to 1970. The h-index might change.
Publish or Perish software (free)

Publish or Perish

Are you applying for tenure, promotion or a new job? Do you want to include evidence of the impact of your research? Is your work cited in journals which are not ISI listed? Then you might want to try Publish or Perish, designed to help individual academics to present their case for research impact to its best advantage.

**Version:** 4.15.1 (31 May 2015)
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- Download for OS X
- Download for GNU/Linux

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- What Publish or Perish is for
- How to cite Publish or Perish
- Metrics
- Training resources
- Caveat emptor
- Download and install PoP
  - Publish or Perish on Microsoft Windows
**h-index prediction tool**

### H-index prediction

Read details in *Acuna, Allesina, Kording, Nature, 489, 201-202 (2012)*

**H-index**
- **5**

**# articles**
- **12**

**Years since first article**
- **8**

**# distinct journals**
- **5**

**# articles in "top" journals**
- **1**

![Graph showing future h-index over years ahead]

- **Future h-index**
  - **Years ahead**: 1 to 10
  - **Future h-index**: 6, 8, 9, 11, 12, 12, 14, 15, 16, 16


**# distinct journals**: number of different journals where you have published in.

**Note**: The equations and the calculator model people that are in *Neurotree*, have an h-index 5 or more, and are between 5 to 12 years after publishing first article.

More info:
- [All media (Wired, The Scientists, The Chronicle, etc.)](#)
- [Article in Nature](#) | [Editorial in Nature](#) | [Podcast (around 14 min. mark) in Nature podcast](#) | [Podcast NPR Science Friday (Spanish)](#
What is a good $h$-index?

For physicists:

Successful $\rightarrow h$-index of 20 after 20 years of activity
Outstanding $\rightarrow h$-index of 40 after 20 years of activity
Truly unique $\rightarrow h$-index of 60 after 20 years of activity

$h$-index $= 12 \rightarrow$ tenure
$h$-index $= 18 \rightarrow$ full professorship
$h$-index $= 15-20 \rightarrow$ fellowship in American Physical Society
$h$-index $\geq 45 \rightarrow$ membership in National Academy of Sciences

84% of physicists who won Nobel prizes had an $h$-index of at least 30

What is a good $h$-index?

For social scientists:

http://blogs.lse.ac.uk/impactofsocialsciences/the-handbook/chapter-3-key-measures-of-academic-influence/
Validity of $h$-index

NIH-funded researchers have higher $h$-indices than non-NIH-funded researchers.

Ophthalmologists:

Validity of $h$-index

NIH-funded researchers have higher $h$-indices than non-NIH-funded researchers.

Radiologists:

<table>
<thead>
<tr>
<th>Variable</th>
<th>NIH Funding</th>
<th>No NIH Funding</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>($n = 48 [23%]$)</td>
<td>($n = 162 [77%]$)</td>
</tr>
<tr>
<td>$h$-index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>19.1 ± 12.6</td>
<td>10.4 ± 9.0</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>19.5 (9–28.5)</td>
<td>7.5 (4–16)</td>
</tr>
</tbody>
</table>

Questions?

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