

## The footmarks of Eugene Garfield in the journal *Scientometrics*

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The study attempts to survey the influence of Eugene Garfield on the journal *Scientometrics*. His contributions as editor, author, citing, cited and co-cited author, as well as eponymized scholar are considered. In all measures, he turns to be a ubiquitous and imperative personality of the history of the journal – and, of course, also the research field it covers.

### Introduction

If we compare the front materials of the very first issue of the journal *Scientometrics* (Vol. 1, No. 1, September 1978) with that of the most recent one (Vol. 82, No. 3, March 2010), among the long lists of editorial staff, we find a rather thin overlap. There are two fix points among the leading officials: present Editor-in-Chief (then Managing Editor) Tibor Braun and present Honorary Editor (then Editor-in-Chief) Eugene Garfield. (The only fixed star among the GI's of the Editorial Board is Francis Narin.)

The role and significance of Garfield was extraordinary from the very first moment of not even the birth but the conception of the journal. Two years before the actual launching, the late Imre Ruff, Tibor Braun's fellow Professor of Chemistry and pioneer of the field, invited Garfield to act as Co-Editor-in-Chief. He welcomed the bold initiative, and willingly accepted the invitation (Figure 1).

Encounters of Garfield and the journal *Scientometrics* have been regular and substantial ever since. Several aspects of this beneficial interaction are collected and documented in the present compilation. It has to be stressed that this study is restricted to the analysis of his direct influence exerted personally or through his published scientific works. The appraisal of the impact of his greatest masterpiece, whether we call it ISI, SCI,

WoS or WoK, just on this single journal would fill the multiple of the volume designated for this contribution.

### Garfield as author of *Scientometrics* papers

Given the early connection between Garfield and the journal *Scientometrics*, it is no surprise that his writings were present from the very first issue of the journal. In his "Editorial statement" (#1 in Table 1), he generously wrote: "We urge the wider utilization, not only of the Science Citation Index data, but of any other bibliographic databases to provide greater insights into the working of science. It is with this sense of purpose that the publication of *Scientometrics* is welcomed and we will do our utmost to make it a success."

His first original contribution was also published in the first volume of the journal. The paper (#2 in Table 1) was intended to give "a comprehensive discussion on the use of citation analysis to rate scientific performance and the controversy surrounding it", and is a creed of evaluative scientometrics ever since. Its first citation was a Letter to the Editor by Daryl Chubin<sup>1</sup>, who challenged Garfield on apparently omitting "several critical pieces that emanate from a scholarly segment of the science studies community". In his reply (#3 in Table 1), Garfield defended his selection of literature, and quoted Merton to properly position his paper: "[It] can be read less as a newly-

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December 21, 1976

I. Ruff, Ph.D., D.Sc./Chemistry  
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HUNGARY

Dear Dr. Ruff:

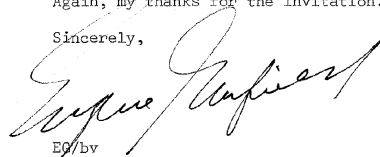
I am very happy to accept your invitation to be one of the editors-in-chief with Professors D. deSolla-Price, V. V. Nalimov and G. M. Dobrov of the new journal SCIENTOMETRICS.

The idea of an international journal which will publish papers on quantitative aspects of science of science and science policy is a good one. There are not many journals where researchers in these areas can publish their results quickly and have a broad readership.

The editorial board is a very distinguished one, and I am sure that with their help, the journal will be able to publish high quality papers. Please keep me informed of progress in the development of the new journal, and what ways you wish me to participate.

Again, my thanks for the invitation.

Sincerely,



EG/bv

Fig. 1 — Eugene Garfield's letter of acceptance to the invitation to act as Editor-in-Chief of the journal *Scientometrics*

developed defense of the use of citation analysis for assessing individual scientific performance than as a methodological manual for those who venture into those dangerous waters...[It is a] strong reminder that citation counts cannot be responsibly taken as the controlling basis for appraisals of individual performance." Wise words, worth remembering even three decades after. The paper was cited 106 times, making it one of the most cited article both of the author and of the journal.

Most of Garfield's later contributions to the journal were items about persons (sadly, about great colleagues having passed away) except for a contribution to a discussion issue on "Theories of Citation?" (#6 in Table 1) and a refreshing original paper co-authored by Henk Moed in 2004 (#10). As Editors of *Scientometrics*, we sincerely hope that the list in Table 1 is incomplete yet.

### Garfield as author of papers cited in *Scientometrics*

In total, 251 journal articles of Garfield (including Current Contents whether published in the Current Contents

or in the "Essays of an Information Scientist" volumes) have been cited in 318 *Scientometrics* papers 646 times. It means that about 1 of every 8 papers in *Scientometrics* had at least one Garfield article in its reference list. The time span of the cited papers is from 1955<sup>2</sup> to 2007<sup>3</sup>, an amazing 53 years. The paper most cited in *Scientometrics* is his 1972 *Science* article<sup>4</sup> receiving 69 citations in this journal (from among the more than 800 citations received by this paper in total). This was the paper laying the foundations of the concept of impact factor.

As shown in Figure 2, the first wave of citations came in the late seventies–early-to-mid eighties followed by the second one a decade later, and no sign of decay can be seen up to the present.

### Garfield as author of papers citing *Scientometrics*

The first citation the journal *Scientometrics* has ever received (and recorded in international databases) came from Garfield in August, 1979<sup>5</sup>. Still in this year, in an imaginative essay<sup>6</sup>, he introduced the journal in details to

Table 1— Eugene Garfield's papers published in the journal *Scientometrics*

Sl. No.	Author(s)	Title	Bibliographic data	Times cited
1	Garfield, E	Editorial statement	1(1) (1978) 5–7	0
2	Garfield, E	Is citation analysis a legitimate evaluation tool?	1(4) (1979) 359–375	106
3	Garfield, E	Is citation analysis a legitimate evaluation tool? Reply	2(1) (1980) 92–94	0
4	Garfield, E	In tribute to Derek John deSolla Price – A citation analysis of Little Science, Big Science	7(3-6) (1985) 487–503	13
5	Garfield, E; Small, H	Michael, J. Moravcsik – Multidimensional scholar and hero of third-world science	20(1) (1991) 19–24	1
6	Garfield, E	Random thoughts on citationology. Its theory and practice – Comments on theories of citation?	43(1) (1998) 69–76	26
7	Garfield, E	Foreword	50(1) (2001) 5–6	0
8	Garfield, E	Reminiscences of Vassily V. Nalimov	52(2) (2001) 165–166	0
9	Garfield, E	The intended consequences of Robert K. Merton	60(1) (2004) 51–61	1
10	Moed, HF; Garfield, E	In basic science the percentage of 'authoritative' references decreases as bibliographies become shorter	60(3) (2004) 295–303	8

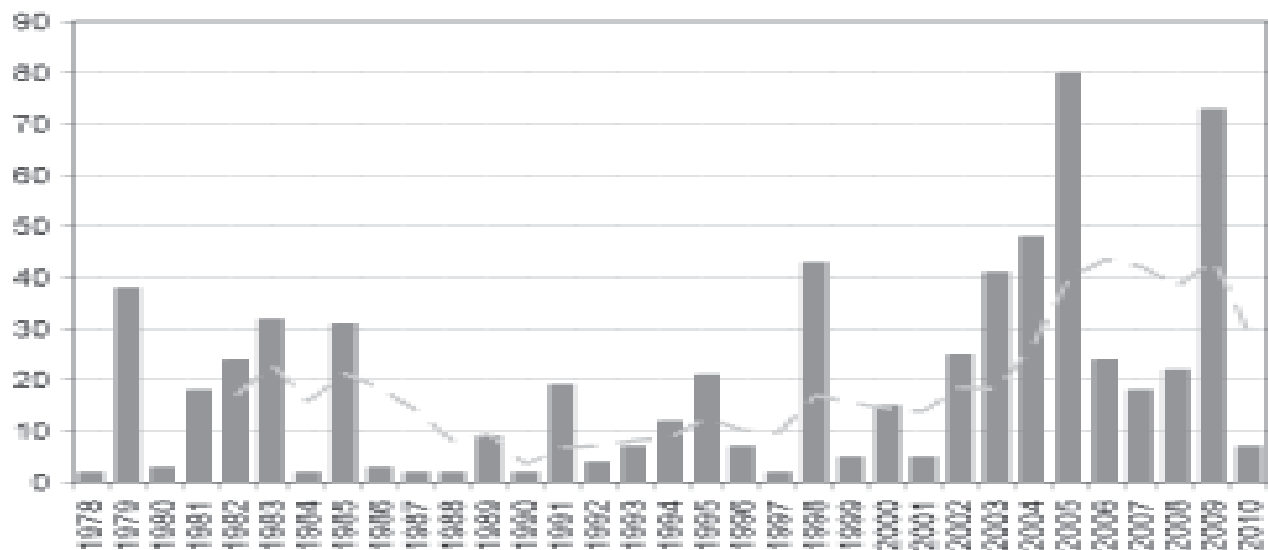


Fig. 2 — Number of citations in *Scientometrics* to Eugene Garfield's papers. Annual values (bars) and 5-year moving average (dashed line)

the overly wide readership of *Current Contents*. His words of recommendation have a message valid until today: "Measuring science has become an important issue [...]. The public everywhere is demanding better use of scarce research funds. *Scientometrics* can provide the kind of quantitative data that legislators can understand. The qualitative conclusions one can draw from such data

will always depend upon the wisdom used in their application."

Garfield cited *Scientometrics* in 50 of his journal articles (including *Current Contents*) 100 times. Since these papers received a total of about 500 citations (with an h-index of 10), he contributed to the "indirect influence"<sup>7</sup>

Table 2—Eugene Garfield’s most cited papers citing *Scientometrics*

Sl. No.	Author(s)	Title	Bibliographic data	Times cited
1	Garfield, E	The history and meaning of the journal impact factor	<i>JAMA-J. Am. Med. Assoc.</i> , 295(1) (2006) 90–93	189
2	Small, H; Garfield, E	The geography of science - Disciplinary and national mappings	<i>J. Inf. Sci.</i> , 11(4) (1985) 147–159	99
3	Garfield, E	From citation indexes to informetrics: Is the tail now wagging the dog?	<i>Libri</i> , 48(2) (1998) 67–80	37
4	Pudovkin, AI; Garfield, E	Algorithmic procedure for finding semantically related journals	<i>J. Am. Soc. Inf. Sci. Technol.</i> , 53(13) (2002) 1113–1119	35
5	Garfield, E	Random thoughts on citationology. Its theory and practice - Comments on theories of citation?	<i>Scientometrics</i> , 43(1) (1998) 69–76	26
6	Garfield, E	Validation of citation analysis	<i>J. Am. Soc. Inf. Sci.</i> , 48(10) (1997) 962–962	16
7	Garfield, E	When to cite	<i>Libr. Q.</i> , 66(4) (1996) 449–458	16
8	Garfield, E; Melino, G	The growth of the cell death field: An analysis from the ISI Science citation index	<i>Cell Death Differ.</i> , 4(5) (1997) 352–361	15
9	Garfield, E	Impact factors, and why they won’t go away	<i>Nature</i> , 411(6837) (2001) 522–522	11
10	Garfield, E; Pudovkin, AI; Istomin, VS	Mapping the output of topical searches in the Web of Knowledge and the case of Watson-Crick	<i>Inf. Technol. Libr.</i> , 22(4) (2003) 183–187	10

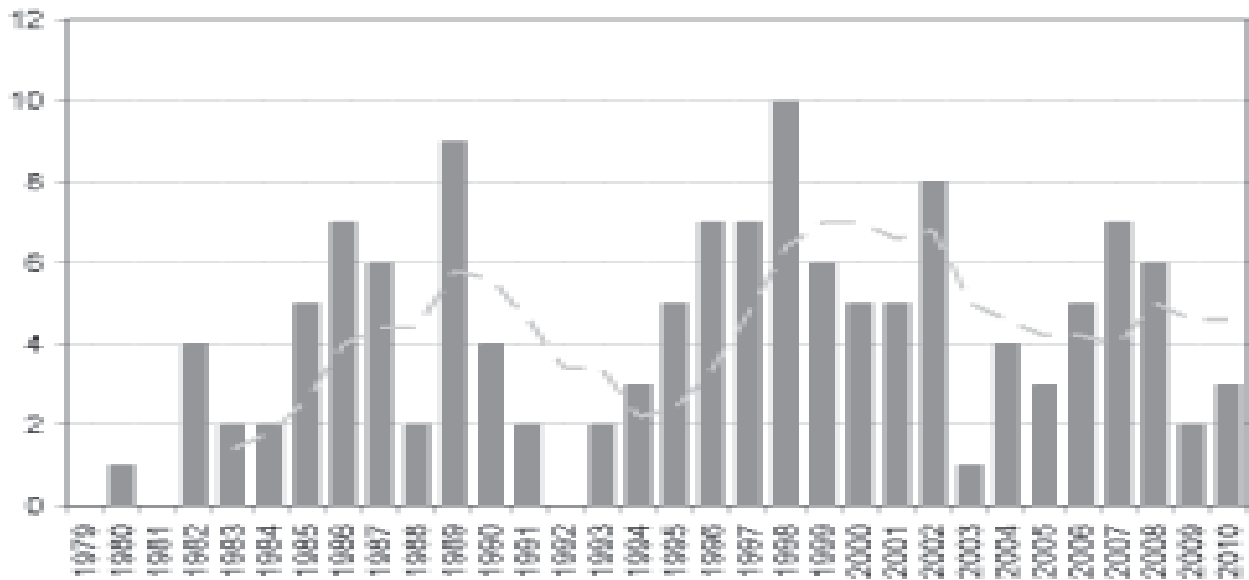


Fig. 3 — Number of citations in *Scientometrics* to Garfield’s book “Citation Indexing”. Annual values (bars) and 5-year moving average (dashed line)

of the journal immensely. Table 2 lists the “h-core” of these articles, i.e., the 10 papers receiving at least 10 citations.

### Garfield’s book on “Citation Indexing”

Garfield’s landmark book<sup>8</sup> has been published in 1979, almost simultaneously with the first volume of the journal *Scientometrics*. Obviously, the book could not utilize, therefore, *Scientometrics* references. The journal was, on the other hand, a significant source of references to the book: 133 of its 848 citations came from *Scientometrics* papers. Figure 3 shows the time trends of these citations. It can be clearly seen that after the peaks of the late eighties and the years of the turn of the millennium, the end of the first decade of the 21st century brought another renaissance of the book, which can be

therefore considered an indispensable companion book for (at least) two centuries.

The close relation between the book and the journal is also shown by the fact that in 408 cases from the 848 citations the book was co-cited with at least one *Scientometrics* paper; 83 of them have been published in *Scientometrics* itself. The “h-core” of the highest co-cited *Scientometrics* papers (12 papers co-cited at least 12 times) is listed in Table 3. These papers can be regarded as the closest relatives of the book from the journal – at least from a co-citationist perspective.

Taking into account that 133 papers citing the book were published in *Scientometrics* and a further 408–83=325 cited at least one *Scientometrics* paper, a total of 458 citing papers (54%) were related to the journal in some or another way.

Table 3 — *Scientometrics* papers most co-cited with Garfield’s “Citation Indexing” book

Sl. No.	Author(s)	Title	Bibliographic data	Times co-cited
1	Moed HF, Debruin RE, Van Leeuwen TN	New bibliometric tools for the assessment of national research performance – database description, overview of indicators and first applications	33 (1995) 381–422	22
2	Small H, Sweeney E	Clustering the science citation index using co-citations, Part 1. A comparison of methods	7 (1985) 391–409	22
3	Garfield E	Is citation analysis a legitimate evaluation tool?	1(4) (1979) 359–375	21
4	Cozzens SE	What do citations count – the rhetoric-first model	15 (1989) 437–447	20
5	Schubert A, Braun T	Relative indicators and relational charts for comparative-assessment of publication output and citation impact	9 (1986) 281–291	20
6	Schubert A, Glänzel W, Braun T	Scientometric datafiles - a comprehensive set of indicators on 2649 journals and 96 countries in all major science fields and subfields 1981-1985	16 (1989) 3–478	19
7	Small H, Sweeney E, Greenlee E	Clustering the science citation index using co-citations, Part.2. Mapping science	8 (1985) 321–340	18
8	Leydesdorff L	Theories of citation?	43 (1998) 5–25	16
9	Small HG, Crane D	Specialties and disciplines in science and social-science - examination of their structure using citation indexes	1 (1979) 445–461	15
10	Peritz BC	A classification of citation roles for the social-sciences and related fields	5 (1983) 303–312	15
11	Van Raan AFJ	Advanced bibliometric methods as quantitative core of peer review based evaluation and foresight exercises	36 (1996) 397–420	13
12	Moed HF, Burger WJM, Frankfort JG, Van Raan AFJ	The application of bibliometric indicators – important field-dependent and time-dependent factors to be considered	8 (1985) 177–203	13

Table 4 — Vinkler's papers in *Scientometrics* using the term "Garfield factor"

Sl. No.	Author(s)	Title	Bibliographic data
1	Vinkler P	An attempt for defining some basic categories of scientometrics and classifying the indicators of evaluative scientometrics	50 (2001) 539–544
2	Vinkler P	Subfield problems in applying the Garfield (Impact) Factors in practice	53(2002) 267–279
3	Vinkler P	Dynamic changes in the chance for citedness	54 (2002) 421–434
4	Vinkler P	Relations of relative scientometric indicators	58 (2003) 687–694
5	Vinkler P	Science indicators, economic development and the wealth of nations	63 (2005) 417–419
6	Vinkler P	Composite scientometric indicators for evaluating publications of research institutes	68 (2006) 629–642
7	Vinkler P	Introducing the Current Contribution Index for characterizing the recent, relevant impact of journals	79 (2009) 409–420
8	Vinkler P	The pv-index: a new indicator to characterize the impact of journals	82 (2010) :61–475

### Garfield as eponym

In his brilliant essay<sup>9</sup>, Garfield collected a treasury of useful and entertaining information on eponymy in science. He also touches on the phenomenon of self-eponymy, and confesses: "I've had a hand in this game. Several years ago I proclaimed Garfield's law of concentration<sup>10</sup> and Garfield's constant<sup>11</sup>. Garfield's law of concentration is not really a law but a principle. It asserts that a small group of multidisciplinary and high-impact specialty journals account for a large percentage of references and publications in all fields of science. Garfield's constant refers to the average number of citations per cited paper in the annual Science Citation Index". There was no sign that any of these concepts would have found their way to *Scientometrics* papers; as a matter of fact, we could find only one single non-self-citation to one of these self-eponyms in the literature<sup>12</sup>.

There are, however two non-self-eponyms which, although their first occurrence were not in *Scientometrics*, but were attempted to be propagated to a wider audience through this journal.

Jasienski coined the term "Garfield's demon" as a metaphor of the all-seeing database that later evolved to the Web of Knowledge. The term remained largely unrecognized having been published in a local Polish periodical<sup>13</sup>, but a recent reintroduction in *Scientometrics*<sup>14</sup> may bring it a wider recognition. In the author's words: "Eugene Garfield's citation-counting demon aims at bringing order to the world of human intellect. Its goal is to scan bibliographies of millions of academic publications, and to reveal in the patterns of

citations and co-citations of papers how people think. It detects emerging frontiers of research, and ranks scientific journals, individual researchers, organizations, or even countries by their importance in the quest for knowledge."

Vinkler created the term "Garfield factor" as a synonym for the "traditional" JCR impact factor to distinguish it from the numerous modified or "improved" variants. After first using it in a multi-author volume<sup>15</sup>, he consistently used the term in his *Scientometrics* articles (Table 4) and also elsewhere<sup>16</sup>.

One paper was found in the literature using the term "Garfield factor" by authors other than the creator of the term<sup>17</sup>.

### Conclusions

Eugene Garfield's influence on the journal *Scientometrics* has been, is and will be immense. It dates back far before the actual launching of the journal, continued permanently up to the present days, and certainly will last long in the future. It manifests itself in editorial work, authorships, citations, references and, above all, in the omnipresence of his intellectual radiation wherever the web of science (not necessarily the Web of Science) is studied and analyzed. We, editors, authors and readers of the journal enjoy the benefits of this radiation, and wish to enjoy it for long in the future.

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