

iMDの位置付けと可能性

TSUKUBA indexへのコメント

筑波大学図書館情報メディア系 教授
人工知能科学センター
附属図書館研究開発室
逸村 裕

ビブリオメトリクスの視点から

Index for **M**easuring **D**iversity



資金獲得

研究評価

Google Scholar



採用
昇進

教育
授業評価

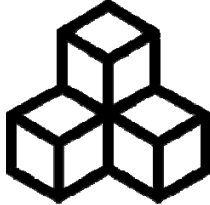
テニユア
業績評価



Impact Factor

h-index

FWCI



大学・研究機関



教員/研究者



研究成果

社会貢献

機関評価

InCites™

SciVal オルトメトリクス

引用情報

WEB OF SCIENCE™

Scopus

ビブリオメトリクス

科学計量学 Scientometrics

書誌・図書・文献・特許・引用などを量的に扱う

客観的な指標

学術雑誌論文の引用 Impact Factor

学術論文の生産性 h-index

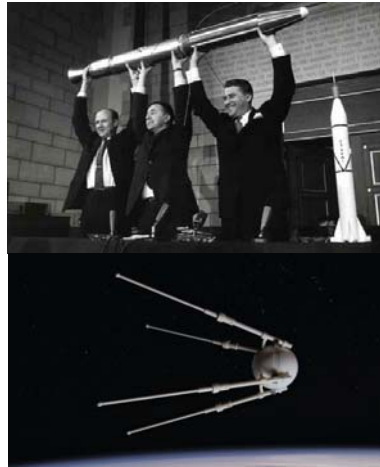
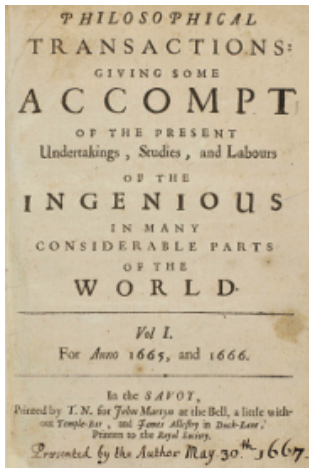
1916年ごろから研究論文がある

Bibliometricsという語は1969年から

図書館の世界では文献の利用を定量的にとらえる試みがなされていた

Bradford Zipf Lotka

1990年頃、研究評価に用いられるようになった



1665

The Royal Society.
Philosophical Transactions
<http://rstl.royalsocietypublishing.org>

1950s~

Big Science
情報爆発

Derek de Solla Price

リトルサイエンス・ビッグサイエンス(1963)

Eugene Garfield

Science Citation Index 引用

Henry Small

Francis Narin

学術論文・雑誌の増加・EJ化・価格高騰

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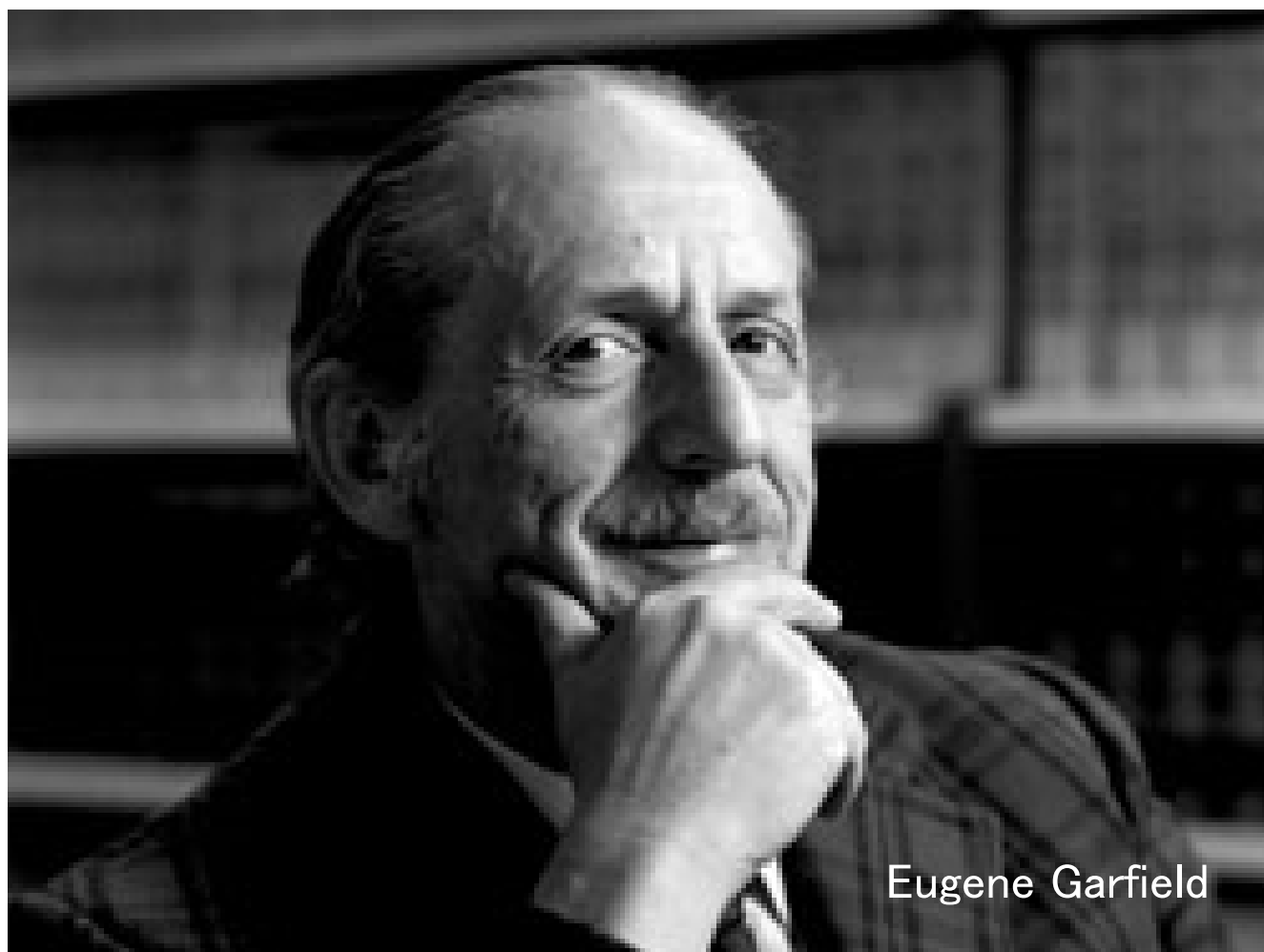
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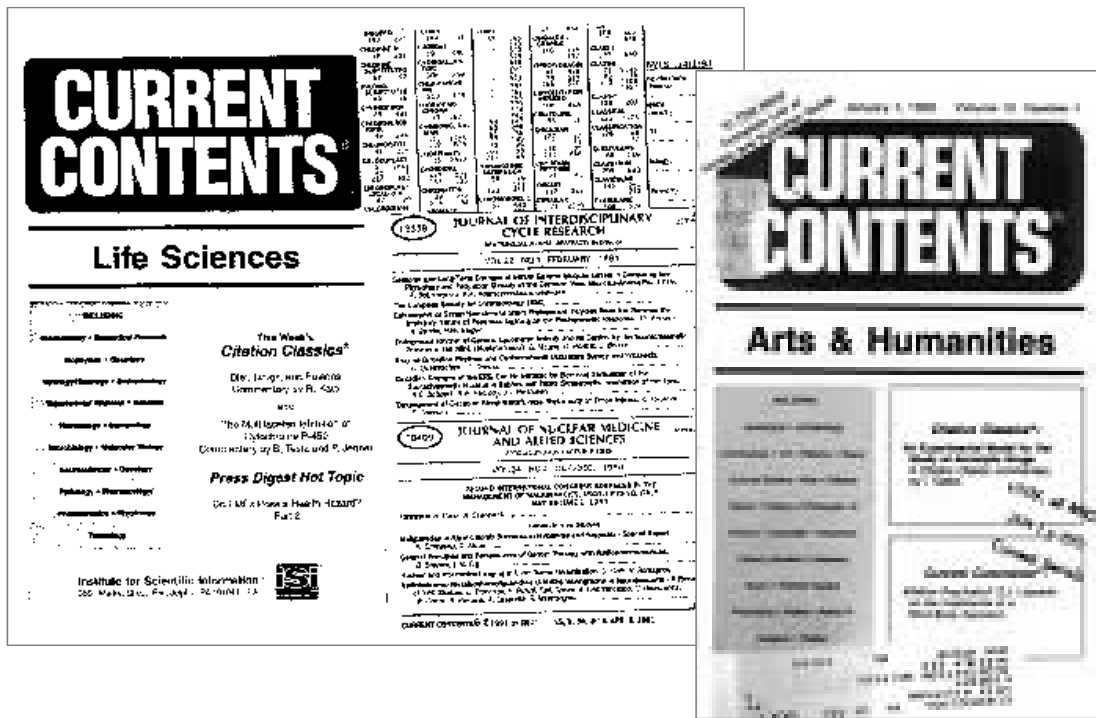
2014 Nobel Prize in Chemistry

CAS congratulates Eric Betzig, Stefan W. Hell and William E. Moerner, winners of the 2014 Nobel Prize in Chemistry.


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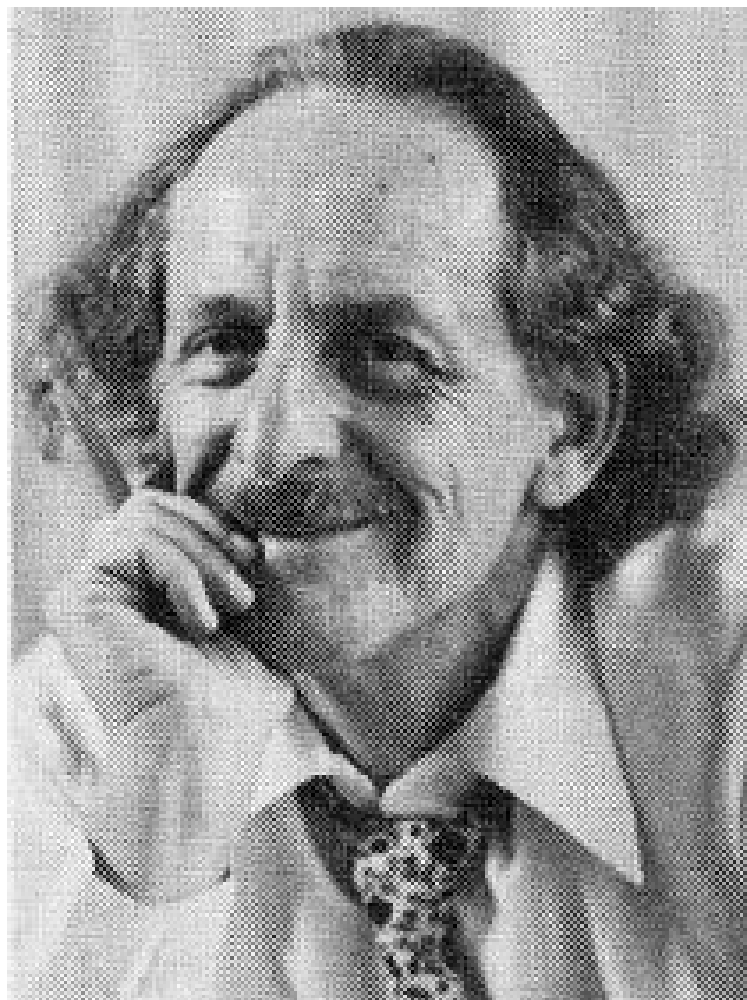
HIGHLIGHTS

- Search multiple disciplines
- Find high-impact articles
- Discover emerging trends

INTENDED FOR

- Academic Researcher
- Librarian
- University Student

Current Contentsに
収録する雑誌を
どうやって選ぶか？



Impact Factor (IF) とは？

学術雑誌の評価指標

「ある雑誌に掲載・発表された論文が**平均的には何回引用されたか**を示す尺度。対象年の前2年間の引用統計を平均化・計算されています」

Journal Citation Report(JCR)で毎年発表

「Journal Impact Factor(JIF)」とも

論文インパクトファクター (*Science*, 1955)

populations that scarcely need vaccination, because of a low incidence of paralysis, already have an abundance of

National Foundation for Infantile Paralysis.
7. J. F. Enders, T. H. Weller, F. C. Robbins, *Science* 100, 84, (1949).
8. J. S. Youngner, *Proc. Soc. Exptl. Biol. and Med.*

17. D. M. Horstmann et al., *J. Exptl. Med.* 86, 309 (1947).
18. D. Bodian, *Am. J. Hyg.* 60, 338 (1954).
19. H. A. Howe, I. M. Morgan, and L. Dong, *J. Exptl. Med.*

J. Hyg. 60, 83 (1954).
5. D. Bodian, *Med.* 57, 81 (1953).
6. This work was aided by a grant from the

Sci. 222, 292 (1951).
16. A. B. Sabin and R. Ward, cited in *J. Mt. Sinai Hosp.* 11, 185 (1944).

26. H. A. Howe, D. Bodian, I. M. Morgan, *Am. J. Hyg.* 51, 85, (1950).
27. H. A. Howe, *Am. J. Hyg.* 60, 371 (1954).

Citation Indexes for Science

A New Dimension in Documentation
through Association of Ideas

Eugene Garfield

"The uncritical citation of disputed data by a writer, whether it be deliberate or not, is a serious matter. Of course, knowingly propagandizing unsubstantiated claims is particularly abhorrent, but just as many naive students may be swayed by unfounded assertions presented by a writer who is unaware of the criticisms. Buried in scholarly journals, critical notes are increasingly likely to be overlooked with the passage of time, while the studies to which they pertain, having been reported more widely, are apt to be rediscovered." (1)

In this paper I propose a bibliographic system for science literature that can eliminate the uncritical citation of fraudulent, incomplete, or obsolete data by making it possible for the conscientious scholar to be aware of criticisms of earlier papers. It is too much to expect a research worker to spend an inordinate amount of time searching for the bibliographic descendants of antecedent papers. It would not be excessive to demand that the thorough scholar check all papers that have cited or criticized such papers, if they could be located quickly. The citation index makes this check practicable. Even if there were no other use for a citation index than that of minimizing the citation of poor data, the index would be well worth the effort required to compile it.

This paper considers the possible utility of a citation index that offers a new

approach to subject control of the literature of science. By virtue of its different construction, it tends to bring together material that would never be collated by the usual subject indexing. It is best described as an association-of-ideas index, and it gives the reader as much leeway as he requires. Suggestiveness through association-of-ideas is offered by conventional subject indexes but only within the limits of a particular subject heading.

If one considers the book as the macro unit of thought and the periodical article the micro unit of thought, then the citation index in some respects deals in the submicro or molecular unit of thought. It is here that most indexes are inadequate, because the scientist is quite often concerned with a particular idea rather than with a complete concept. "Thought" indexes can be extremely useful if they are properly conceived and developed.

In the literature-searching process, indexes play only a small, although significant, part. Those who seek comprehensive indexes to the literature of science fail to point out that such indexes, although they may be desirable, will provide only a better starting point than the one provided in the selective indexes at present available. One of the basic difficulties is to build subject indexes that can anticipate the infinite number of possible approaches the scientist may require. Proponents of classified indexes may suggest that classification is the solution to this problem, but this is by no means the

case. Classified indexes are also dependent upon a subject analysis of individual articles and, at best, offer us better consistency of indexing rather than greater specificity or multiplicity in the subject approach. Similarly, terminology is important, but even an ideal standardization of terminology and nomenclature will not solve the problem of subject analysis.

What seems to be needed, then, in addition to better and more comprehensive indexes, alphabetical and classified, are new types of bibliographic tools that can help to span the gap between the subject approach of those who create documents—that is, authors—and the subject approach of the scientist who seeks information.

Since 1873 the legal profession has been provided with an invaluable research tool known as *Shepard's Citations*, published by Shepard's Citations, Inc., Colorado Springs, Colo. (2). A citation index is published for court cases in the 48 states as well as for cases in Federal courts. Briefly, the Shepard citation system is a listing of individual American court cases, each case being followed by a complete history, written in a simple code. Under each case is given a record of the publications that have referred to the case, the other court decisions that have affected the case, and any other references that may be of value to the lawyer. This type of listing is particularly important to the lawyer, because, in law, much is based on precedent.

Citation indexes depend on a simple system of coding entries, one that requires minimum space and facilitates the gathering together of a great volume of material. However, a code is not absolutely necessary if one chooses to compile a systematic listing of individual cases or reports, with a complete bibliographic history of each of them. Thus, it would be possible to list all pertinent references under each case with sufficient com-

Mr. Garfield is a documentation consultant with offices at 1330 Spring Garden St., Philadelphia 1, Pa.

SCIENCE, VOL. 122

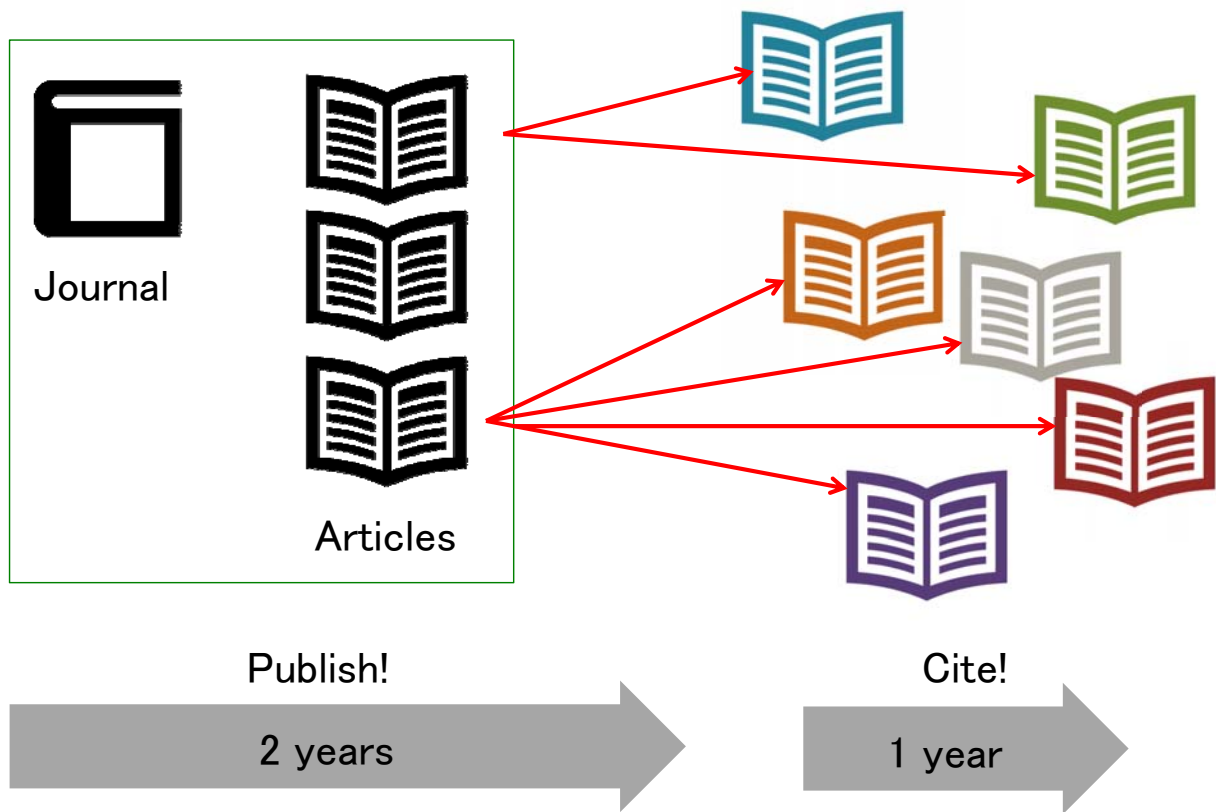


IFの算出方法

X年から過去2年分の論文がX年に引用された回数

X年から過去2年分の論文数

IFの算出方法



IFの算出方法

X年から過去2年分の論文がX年に引用された回数

X年から過去2年分の論文数

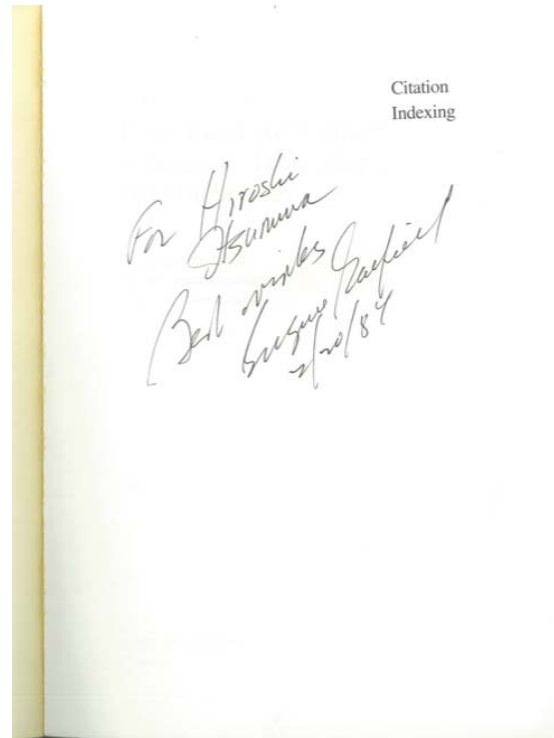
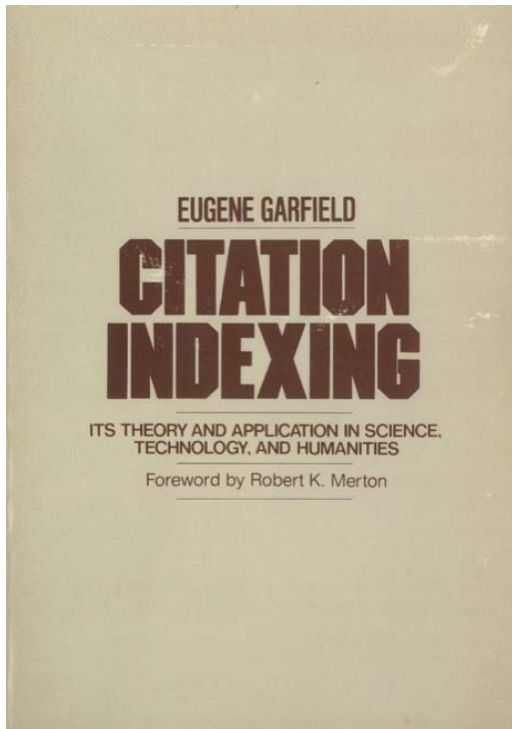
1年間の引用回数 6

$$\frac{\text{1年間の引用回数 } 6}{\text{2年間の論文数 } 3} = 2.0$$

2年間の論文数 3

これが何を意味するか

計量書誌学の発展



IFと研究評価

IFは引用からの雑誌の指標である、研究(者)評価には使えない、と何度も指摘されているが

雑誌の定量的な評価についてはこれまで多くの指標が検討されてきた

最も広く普及しているのがIF。5 year IF、Fieldnormalized IFなどバリエーションもある
アイゲンファクタ(EigenFactor)も被引用数に基づく指標

佐藤翔. 学術情報をめぐる新たな評価指標--Impact Factor, h-index, Eigenfactor, Article Influence, Usage Factor. 薬学図書館, vol.54, no.2, p.121-132, 2009.

被引用文献と引用文献の出版年の差、すなわち引用年齢による補正を施したDiscounted IF (Zimmermann, 2012)

引用の最新性・即時性に焦点を当て、引用年齢に基づいて雑誌を評価する指標: 即時性指数、被引用半減期、引用半減期など数多く提案

それらを総合的に考慮するRM-indexによる雑誌ランキングの試み(Raj & Zainab, 2012)

既往研究の多くは、被引用数や引用年齢など、引用という側面からの評価が中心

そのような指標の妥当性は、引用という行為に評価的観点(Moravcsik & Murugesan、1975)(特にポジティブな評価)を認めるのが前提

しかしそれは分野によって、特に人文系では、様相が大きく異なる

そもそも、人文系ではIFが入手・利用できない雑誌が多く、それに代わる指標が検討されている

Marchi & Lorenzetti (2016)は、人文系のようにIFが使えないとき、雑誌の重要度をいかに定量的に計測すべきかについて、雑誌への質問紙調査に基づき議論している

雑誌の評価には引用に基づくものだけでなく**多様な指標**が必要であり、それらを併せて用いることで多面的な評価を実施するのが望ましいと考えられる

重要と考えられる側面の1つが、論文の**著者所属の多様性**である

これは、Web of Scienceなどにおける雑誌の採録基準でも触れられている(Testa, 2004)

必ずしも国際共著が高い被引用数につながるとは限らないという指摘もある (Peclin et al., 2012)

著者所属の多様性は、雑誌の国際性・国際的可視性に関わる

Andrei et al. (2016)は、Theil (1967)の集中度指標を利用して、著者の所属国の分布をもとに雑誌の国際的可視性を評価

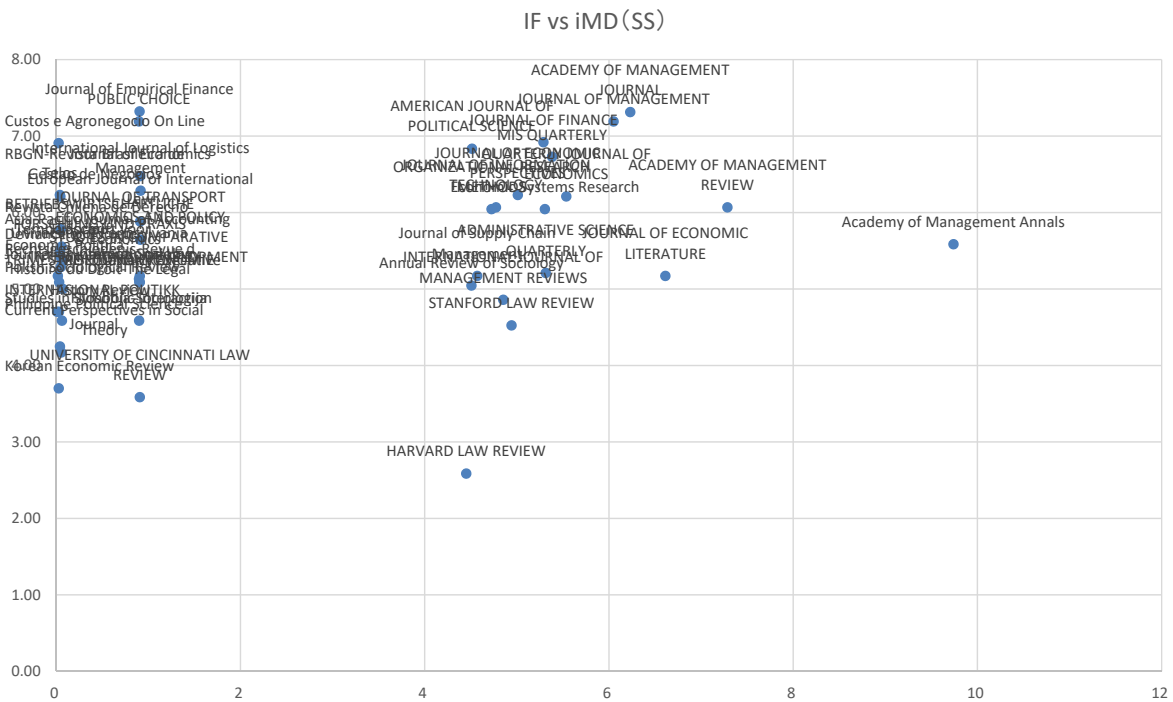
Dyachenko (2014)は、著者の所属、言語の分布をもとに、雑誌の国際化の度合を分析し、分野間比較

しかしながら、著者所属の多様に関する定量的な分析手法は検討が**未だ不十分**であり、雑誌の評価指標として確立していないのが現状である

IFとiMD順位比較

Journal	Impact Factor	Journal	iMD対数 (2)
Nature Biotechnology	43.113	Nature Communications	11.65
Nature Materials	38.891	PNAS	11.47
Nature	38.138	Nature	11.07
Nature Nanotechnology	35.267	Applied Physics Letters	10.97
Science	34.661	Physical Review D	10.91
Nature Genetics	31.616	Journal of Biological Chemistry	10.90
Nature Photonics	31.167	Chemical Communications	10.88
Nature Medicine	30.357	Physical Review Letters	10.87
Cell	28.710	Physical Review B	10.86
Nature Chemistry	27.893	ASTROPHYSICAL JOURNAL	10.85
Nature Methods	25.328	Monthly Notices of the Royal Astronomical Society	10.72
Immunity	24.082	Science	10.58
Cancer Cell	23.214	Analytical Chemistry	10.57
Cell Stem Cell	22.387	Angewandte Chemie International	10.52

IFとiMD比較 SS



iMDの可能性

学術情報DBにおける学術雑誌の格付け指標
大学の研究力評価のデータとして

謝辞

さまざまなアドバイスとデータ提供をいただいた
皆様に感謝いたします