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Indicators of Journal Quality

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Indicators of Journal Quality

Abstract

Some of the methodologies used to assess journal quality include citation analysis, peer analysis, circulation and coverage in indexing or abstracting services. (Ali, Young et al. 1996, p.41). Both quantitative and qualitative measures such as these are widely discussed in the literature. From a study conducted in the UK, Swan and Brown (1999) found that authors tended to consider firstly the reputation of the journal by using the impact factor, followed by international reach and coverage by abstracting and indexing services. They also found that “Scientists are much more concerned about the availability of an electronic version of the journal than are workers in the arts. Publication speed is also significant to scientists, particularly chemists, whereas it is much less important to people working in social sciences or the humanities”. (Swan and Brown 1999 cited in Houghton, Steele et al. 2003, p.62). In Australia: “Using simple quantitative publications measures in research evaluation and the distribution of funding in Australia has recently been criticised by the Australian Academy of Social Sciences (Mann 2002), Academy of Science (Barber 2002) and the Academy of the Humanities, particularly in relation to publication patterns and the impact on early career researchers. It appears to be leading to increased publication in ‘second tier’ journals” (Houghton, Steele et al. 2003, p.63). Researchers need, therefore, to consider the various methodologies appropriate to their discipline and be aware of the tools available to assist in identifying ‘quality’ journals in which to publish. This report focuses on the measures used by the Institute of Scientific Information (ISI) and the role of peer review as two primary indicators. It includes: • an overview of ISI • a section on peer review – including DEST and Ulrich’s • a UK perspective • an appendix of articles from non-scientific disciplines • an appendix of journal impact in relation to library holdings

Keywords

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INDICATORS OF JOURNAL QUALITY

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Indicators of Journal Quality

Introduction

Some of the methodologies used to assess journal quality include citation analysis, peer analysis, circulation and coverage in indexing or abstracting services. (Ali, Young et al. 1996, p.41). Both quantitative and qualitative measures such as these are widely discussed in the literature. From a study conducted in the UK, Swan and Brown (1999) found that authors tended to consider firstly the reputation of the journal by using the impact factor, followed by international reach and coverage by abstracting and indexing services. They also found that “Scientists are much more concerned about the availability of an electronic version of the journal than are workers in the arts. Publication speed is also significant to scientists, particularly chemists, whereas it is much less important to people working in social sciences or the humanities”. (Swan and Brown 1999 cited in Houghton, Steele et al. 2003, p.62). In Australia: “Using simple quantitative publications measures in research evaluation and the distribution of funding in Australia has recently been criticised by the Australian Academy of Social Sciences (Mann 2002), Academy of Science (Barber 2002) and the Academy of the Humanities, particularly in relation to publication patterns and the impact on early career researchers. It appears to be leading to increased publication in ‘second tier’ journals” (Houghton, Steele et al. 2003, p.63).

Researchers need, therefore, to consider the various methodologies appropriate to their discipline and be aware of the tools available to assist in identifying ‘quality’ journals in which to publish.

This report focuses on the measures used by the Institute of Scientific Information (ISI) and the role of peer review as two primary indicators. It includes:

- an overview of ISI
- a section on peer review – including DEST and Ulrich’s
- a UK perspective
- an appendix of articles from non-scientific disciplines
- an appendix of journal impact in relation to library holdings

Institute of Scientific Information

Journals that are included on the ISI databases have been through a rigorous selection process including peer review. ISI produces statistical analysis of journals, most widely used is the journal impact factor although the immediacy index and citing half-life are also useful indicators. The literature suggests the impact factor is just one of a suite of measures that should be used in conjunction with “measures of esteem, performance, visibility and testimony of peers expert in relation to the activity that is being analysed” (Butler 2004, p.xii) and yet article citation count is often used synonymously with research quality (Najman & Hewitt 2003, p. 64). Others would suggest that scholarly reputation is the most important measure of quality (Kabala 1998; Murphy 1996). Peer review is a process that assists with quality in an academic article, reviewers are “experts both in presentation of academic argument and the subject discussed by the individual article” (Day & Peters 1994, p. 6) These other measures are discussed in more detail further on in this report.

The journal **impact factor** is calculated by dividing the number of citations in the current year to articles published in the two previous years by the total number of articles published in the two previous years, (see Appendix 2 for top 50 impact journals).

The **immediacy index** is calculated by dividing the number of citations to articles published in a given year by the number of articles published in that year. It is useful in comparing how quickly journals are cited.

The **citing half-life** is the number of publication years from the current year that account for 50% of the current citations published by a journal in its article references. This helps evaluate the age of the majority of articles referenced by a journal, while dramatic changes in the citing half-lives over time may indicate a change in a journal's format.

The **cited half-life** is the number of publication years from the current year which accounts for 50% of current citations received. This helps evaluate the age of the majority of cited articles published in a journal. Only those journals cited 100 or more times have a cited half-life. A higher or lower cited half-life does not imply any particular value for a journal because one journal may provide more rapid communication of current information than another. Dramatic changes in cited half-lives over time may indicate a change in a journal's format. (Journal Citation Reports database)

The impact factor is not only used to evaluate journals but also provides a ranking system originally designed for chemistry and life sciences. These fields attract most of their citations approximately two years after publication, however, as an example a better measure for pure mathematics is a four year impact (Rousseau cited in Wormell 1998, p.596). Despite some authors stating impact factors measure visibility rather than quality (Bordons & Zulueta cited in Rowlands 2002, p.2), impact factors are used to “measure research performance of individuals, scientists, research groups, institutes, universities or even countries” (Moed, van Leeuwen et al. 1998, p.388). Amin and Mabe (2000) conclude that “Impact factors, as one citation measure, are useful in establishing the influence journals have within the literature of a discipline. Nevertheless, they are not a direct measure of quality and must be used with considerable care.” (Amin & Mabe 2000, p.6) In short, the journal impact factor cannot be dismissed, but used with an understanding of the limitations. It is also important to remember that “ISI does not comprehensively cover the output of Australian Research in: most fields in the humanities and social sciences; engineering, information sciences, and other fields of research in the applied sciences; or the applied end of the research spectrum, even for those fields generally well covered by ISI indices.” (Butler 2004, p.1)

ISI produces the following statistical packages (not subscribed to by the Library):

- [Australian University Indicators](#) is a summary of publications and citations statistics for 26 higher education institutions – UoW is included in the 26
- [Essential Science](#) is a compilation of science performance statistics and trends, derived from ISI databases, to rank authors, institutions, countries and journals
- [National Citation Reports](#) provide a data format, interface and critical comparative citation statistics that allows for complex manipulation of large set of data for a variety of analyses.

Table 1: Strengths and Limitations of Journal Impact Factors

Strengths	Limitations
<p>“The U.S. has demonstrated that publications that are highly cited in the research literature are much more likely to be cited in patents, suggesting strongly that research excellence and contributions to innovation go hand in hand.” (Foreword in Butler 2004)</p>	<p>Citations “only indicate that other professionals working in the same area have found the ideas in a specific article valuable in some way to their own work (whether positively or negatively).” (Murphy 1996, p.10)</p>
<p>“They are quantitative.” (Evans & White 2002, p.15)</p>	<p>“People with the same networks tend to heavily cite each other’s work...[with]..strong geographical and regional tendencies”. (Najman & Hewitt 2003, p.69)</p>
<p>“They are continually updated (approx on a two-monthly basis.” (Evans & White 2002, p.15)</p>	<p>Different disciplines vary in their profiles of research citation patterns and research quality, culture of citing (including one’s own). (Najman & Hewitt 2003, p.77; Murphy 1996, p.8)</p>
<p>“They are collected by a disinterested international organisation” (Evans & White 2002, p.15)</p>	<p>Favours English speaking countries and regions – not all research output is reported in ISI databases. (Evans & White 2002, p.16; Royle & Over 1994, p.78)</p>
<p>“Attempts to measure teaching quality across university sectors (eg. in the UK) have had poor success.” (Evans & White 2002, p.15)</p>	<p>“Citation statistics cannot be used to judge a single article...only...an average article.” (Kabala 1998, p.2)</p>
<p>“Although, at the level of an individual publication, citations do not necessarily equate with quality, at a broad enough level it is impossible to sustain high citation rates without research quality.” (Evans & White 2002, p.15)</p>	<p>“Impact factors are heavily influenced by subject field, document type and journal size; by the number of citations and by research level, shifting fashions and publication policy.” “Journals containing a high proportion of review articles have often much higher impact factors than ‘normal’ journals.” (Moed, van Leeuwen et al. 1998, p.416; Rowlands 2002, p.2)</p>
<p>“We take as axiomatic that research quality and teaching quality are linked – especially at late undergraduate and postgraduate levels” (Evans & White 2002, p.15)</p>	<p>“Being chosen as an ISI source journal may bring higher citation rates than for journals not listed in the ISI journal set. Citations may be attracted simply because journals are indexed in the citation indexes.” (Murphy 1996, p.10)</p>

Strengths	Limitations
<p>“The quality of research outcomes is measurable not only for whole universities but also for individual departments” (Evans & White 2002, p.15)</p>	<p>“Only those classified as ‘articles’ or ‘reviews’ and ‘proceedings papers’ are counted in the denominator for the impact factor calculation, whereas citations to all papers (including editorials, news items, letters to the editor, etc) are counted for the numerator. This can lead to an exaggerated impact factor (average cites per paper) for some journals compared to others.” (Amin & Mabe 2000, p.6)</p>
<p>Despite the limitations, “when data are used to compare like with like, on a broad enough scale, useful objective comparisons can be made.” (Evans & White 2002, p.16)</p>	<p>“In several practical applications of impact factors, such as the use in the assessment of research performance in a university department or faculty covering several subfields rather than one, there is an absolute and urgent need to make cross comparisons among subfields. The ISI impact factor cannot be used directly for this purpose...” (Moed, van Leeuwen et al. 1998, p.416)</p>
<p>“Bibliometric assessment, in contrast to the subjectivity associated with peer review or evaluation, provides object specification of research performance.” (Royle & Over 1994, p.77)</p>	<p>“The system of journal categories developed by ISI ...is known to have certain shortcomings. For instance some categories cover rather specialised sub-disciplines (eg. endocrinology or astronomy) while others relate to broad fields such as biochemistry and molecular biology, general medicine or ‘multidisciplinary sciences’ (which includes the journals <i>Nature & Science</i>.” (Moed, van Leeuwen et al. 1998, p.417)</p>

Peer Review

Murphy says that peer review has been used as a primary criterion of journal quality because more than half the journal population in which Australian university researchers publish is beyond the range of measurement of the ISI indexes (Murphy 1996, p.12). Peer review takes many forms. Murphy (1996) explains that there are three main types of reviewing procedures and claims that the following range from the least to the most rigorous: open, single-blind, or double-blind. “In open reviewing, both authors’ names and affiliations and reviewers’ names are revealed to both parties in the process. Single-blind reviewing is when the authors’ names and affiliations are known to the reviewer but reviewers’ names are not known to authors. In double-blind reviewing, all names of all parties are withheld. Anonymity in reviewing is important because the process is basically subjective. With anonymity, judgements can be made freely without incurring later prejudice and recrimination.” (Murphy 1996, p.13). Bence and Oppenheim (2004) support this argument. Day & Peters (1994) claim that “The rigour of the review process is a major indicator of the likely quality level of the journal as a whole” (Day & Peters 1994, p.7) In Table 2 below the strengths and limitations of peer review are presented:

Table 2: Strengths and Limitations of Peer Review as an indicator of journal quality

Strengths	Limitations
Peer reviewers are the “experts both in the presentation of academic arguments and the subject discussed by the individual article” (Day & Peters 1994, p.6)	“Individuals in the process are influenced in their task of reviewing by their own experience and knowledge, as well as their ignorance.” (Murphy 1996, p.12)
“Quality of scholarly content itself is assured principally through the use of peer review in the selection of articles for publication, the status of the peer reviewer, and the rigour with which such review is conducted.” (Murphy 1996, p.1)	“There are significant variations in the levels of rigour of the review process.” (Murphy 1996, p.13)
A report entitled Key Perspectives (2002) found that “among their international sample of researchers, 74% strongly agreed that peer review was preferred [as a quality control measure]” (Houghton, Steele et al. 2003, p.63)	

Two major tools (other than ISI) used to identify peer-reviewed journals are the Department of Education, Science and Training (DEST)’s Register of Refereed Journals and Ulrich’s International Periodical Directory (Ulrich’s).

[DEST’s Register](#) is a list of journal titles that have been assessed by DEST as satisfying the peer review requirements for the Higher Education Research Data Collection (HERDC). Those specifications state that submitted articles must contain a “statement in the journal which shows that contributions are peer reviewed” as well as a “statement or acknowledgement from the journal editor which shows that contributions are peer reviewed”. (Department of Education Science and Training 2004, p.20) Many of the titles in the DEST Register are not contained in the ISI databases or Ulrich’s.

[Ulrich’s](#) is one of the world’s largest sources of information about periodicals. DEST acknowledges that if a journal title is listed as *refereed* in this directory then it also meets their refereeing requirements. Refereed titles in Ulrich’s have been through a peer review process: “the system of critical evaluation of manuscripts/articles by professional colleagues or peers. The content of refereed publications is sanctioned, vetted, or otherwise approved by a peer-review or editorial board. The peer-review and evaluation system is utilized to protect, maintain, and raise the quality of scholarly material published in serials. Publications subject to the referee process are assumed, then, to contain higher quality content than those that aren’t.” (Ulrich's International Periodical Directory).

UK Perspective

In an article about the role of publications in the United Kingdom Research Assessment Exercise, it was stated that publications provided “the most valid, fair and direct way to compare the research performance of departments” and that only those based on peer review... were capable of yielding a reasonably valid measurement of departmental performance.” (Gillette cited in Bence & Oppenheim 2004, p.55).

Importantly, the Research Assessment Exercise has taken into consideration the growth of electronic publishing and “since 2001 e-publications were deemed to count towards the RAE in the same way as equivalent peer-reviewed print publications.” (Bence & Oppenheim 2004, p.59). ISI has taken a similar approach and covers nearly 200 peer-reviewed Open Access journals (ie. Those journals that are available electronically at no cost to an individual or institution). (Thomson ISI 2004)

One concern arising from academics about the assessment of research publications for the purpose of Research Assessment is reflected in a study conducted of academic lawyers by Campbell et al (1999): “... [it was] a waste of time to try to publish anything (or write) anything which will not “count” or rate highly in the RAE.... I have been required to produce a larger number of shorter papers for quality journals, at the expense of embarking on more long term, and I believe more valuable, work.” (Campbell, Vick et al. 1999, p.476).

Appendix 1

ARTICLES FROM NON-SCIENTIFIC DISCIPLINES

Another issue in examining journal 'quality' is discipline differences. Below is an annotated list:

Borland, Jeff. (2003) 'Benchmarking research performance of the Department of Economics', University of Melbourne

Discussion of a benchmarking exercise to assess the Department's performance in contributions to knowledge that are publishable in internationally leading general and field journals and international quality research on the Australian economy and economic policy issues. He says "the large number of Economics Departments in Australia and internationally, and the general acceptance of refereed journal publications as the predominant means of contribution to economics, make the type of benchmarking exercise that is reported in this note valid and informative in the discipline area of economics.

Lee, K., M. Schotland, P. Bacchetti & L. A. Bero (2002). 'Association of journal quality indicators with methodological quality of clinical research articles' *JAMA: the journal of the American Medical Association* 287(21): 2805-2808

This study looked at whether journal characteristics of peer-review status, citation rate, impact factor, circulation, manuscript acceptance rate, and indexing on MEDLINE or the Brandon/Hill Library List are associated with the methodological quality of original research articles they publish.

Locke, J. & A. Lowe (2002). 'Problematising the construction of journal quality: an engagement with the mainstream' *Accounting Forum* 26(1): 45-71

This article describes research into the measurement of quality of refereed accounting journals.

Lowe, A. & J. Locke (2004). 'Perceptions of journal quality and research paradigm: results of a web-based survey of British accounting academics' *Accounting, Organizations and Society* In Press, Corrected Proof, Available online 2 July 2004, 1-18

Reports the results of a web-based survey of the ranking of peer reviewed accounting journals by UK academics.

Nederhof, A. J., M. Luwel & H. F. Moed (2001). 'Assessing the quality of scholarly journals in Linguistics: an alternative to citation-based journal impact factors' *Scientometrics* 51(1): 241-265
Methods were developed to allow quality assessment of academic research in linguistics in all sub-disciplines world-wide. Limitations and potentials for application of bibliometric methods in output assessments are discussed.

Appendix 2

LIBRARY JOURNALS WITH IMPACT - 2003

Journal impact factor is a measure of the frequency with which the 'average article' in a journal has been cited in a particular year. The impact factor assists in the evaluation of a journal's relative importance, when compared to others in the same field.

The impact factor is calculated by dividing the number of current citations to articles published in the previous two years by the total number of articles published in the previous two years.

Below is a list of selected subject headings from the ISI Web of Knowledge Journal Reports, 2003. Within each subject heading the three most highly cited journal titles are provided with their impact factor.

- The Library provides access to 89% of the social sciences and science journals.

SOCIAL SCIENCES

Please note: the impact factor may only be compared to other journals in the same subject category.

Held by UWL	Journal title	Subject Category	Impact Factor
Y	Journal of memory and language	Applied linguistics	2.736
N	Language and cognitive processes	Applied linguistics	1.825
Y	Journal of neurolinguistics	Applied linguistics	1.571
Y	Academy of management review	Business	4.415
Y	Academy of management journal	Business	3.343
Y	Strategic management journal	Business	2.723
Y	Journal of accounting & economics	Business, finance	3.844
Y	Journal of finance	Business, finance	3.267
Y	Journal of financial economics	Business, finance	2.723
Y	Human communication research	Communication	1.612
Y	Public opinion quarterly	Communication	1.280
N	Media psychology	Communication	1.167
Y	Family planning perspectives	Demography	3.241
Y	Population bulletin	Demography	3.000
Y	Demography	Demography	1.780
Y	Journal of economic literature	Economics	5.243
Y	Quarterly journal of economics	Economics	4.756
Y	Journal of accounting & economics	Economics	3.844
Y	Review of educational research	Education & educational research	1.690
Y	American educational research journal	Education & educational research	1.635
Y	Reading research quarterly	Education & educational research	1.632
Y	Environment and planning d-society & space	Environmental studies	2.269
Y	Harvard environmental law review	Environmental studies	1.789
Y	Environment and planning a	Environmental studies	1.780
Y	Ethnicity & health	Ethnic studies	0.744
Y	Ethnic and racial studies	Ethnic studies	0.712

N	Identities-global studies in culture and power	Ethnic studies	0.625
Y	Family planning perspectives	Family studies	3.241
Y	International family planning perspectives	Family studies	1.617
Y	Journal of research on adolescence	Family studies	1.605
Y	Progress in human geography	Geography	3.653
N	Transactions of the institute of British geographers	Geography	2.438
Y	Environment and planning d-society & space	Geography	2.269
Y	Health affairs	Health policy & services	3.673
Y	Milbank quarterly	Health policy & services	3.524
Y	Medical care	Health policy & services	3.152
Y	American historical review	History	0.883
Y	Environmental history	History	0.718
Y	Journal of American history	History	0.587
Y	Industrial relations	Industrial relations & labor	1.308
Y	Industrial & labor relations review	Industrial relations & labor	1.301
Y	Journal of labor economics	Industrial relations & labor	1.260
Y	Harvard law review	Law	7.179
Y	Yale law journal	Law	6.507
Y	Stanford law review	Law	4.750
Y	Birth-issues in perinatal care	Nursing	1.709
Y	Advances in nursing science	Nursing	1.625
Y	Nursing outlook	Nursing	1.169
Y	Archives of general psychiatry	Psychiatry	10.519
Y	American journal of psychiatry	Psychiatry	7.157
N	Journal of clinical psychiatry	Psychiatry	4.978
Y	Monographs of the society for research in child development	Psychology, developmental	7.500
Y	Development and psychopathology	Psychology, developmental	4.378
Y	Journal of the American academy of child and adolescent psychiatry	Psychology, developmental	3.779
Y	Annual review of sociology	Sociology	3.205
Y	American sociological review	Sociology	2.383
Y	American journal of sociology	Sociology	2.333
N	Housing policy debate	Urban studies	1.429
Y	Housing studies	Urban studies	1.301
Y	Urban studies	Urban studies	1.297
N	Journal of womens health & gender-based medicine	Women's studies	1.561
Y	Signs	Women's studies	1.122
Y	Reproductive health matters	Women's studies	1.113

SCIENCES

Please note: the impact factor may only be compared to other journals in the same subject category.

Held by UWL	Journal Title	Subject Category	Impact Factor
Y	Faseb Journal	Biology	7.172
Y	Bioessays	Biology	6.491
Y	Biological Reviews	Biology	4.925
Y	Medicinal Research Reviews	Chemistry, Medicinal	7.788
Y	Natural Product Reports	Chemistry, Medicinal	7.529
Y	Journal Of Medicinal Chemistry	Chemistry, Medicinal	4.820
Y	Chemical Reviews	Chemistry, Multidisciplinary	21.036
Y	Accounts Of Chemical Research	Chemistry, Multidisciplinary	15.000
Y	Chemical Society Reviews	Chemistry, Multidisciplinary	9.569
Y	VLDB Journal	Computer Science, Information Systems	4.545
Y	IEEE Network	Computer Science, Information Systems	3.871
Y	ACM Transactions On Information Systems	Computer Science, Information Systems	3.533
Y	Journal Of Hydrology	Engineering, Civil	1.354
Y	Journal Of Composites For Construction	Engineering, Civil	1.234
Y	Coastal Engineering	Engineering, Civil	1.181
Y	IEEE Signal Processing Magazine	Engineering, Electrical & Electronic	4.241
Y	IEEE Network	Engineering, Electrical & Electronic	3.871
Y	IEEE Transactions On Pattern Analysis And Machine Intelligence	Engineering, Electrical & Electronic	3.823
Y	Advances In Applied Mechanics	Engineering, Mechanical	4.222
Y	Progress In Energy And Combustion Science	Engineering, Mechanical	2.963
Y	International Journal Of Plasticity	Engineering, Mechanical	2.768
Y	Global Change Biology	Environmental Sciences	4.152
Y	Environmental Science & Technology	Environmental Sciences	3.592
N	Global Biogeochemical Cycles	Environmental Sciences	3.383
N	Nature Genetics	Genetics & Heredity	26.494
N	Nature Reviews Genetics	Genetics & Heredity	25.664
Y	Genes & Development	Genetics & Heredity	17.013
Y	Quaternary Science Reviews	Geography, Physical	3.181
Y	Holocene	Geography, Physical	2.281
Y	Quaternary Research	Geography, Physical	2.248
Y	Geology	Geology	3.065
Y	Journal Of Metamorphic Geology	Geology	2.490
Y	Journal Of Geology	Geology	2.442
Y	Oceanography And Marine Biology	Marine & Freshwater Biology	2.647
Y	Advances In Marine Biology	Marine & Freshwater Biology	2.500
Y	Canadian Journal Of Fisheries And Aquatic Sciences	Marine & Freshwater Biology	2.432
Y	Progress In Materials Science	Materials Science, Multidisciplinary	12.000

Y	Nature Materials	Materials Multidisciplinary	Science,	10.778
Y	Materials Science & Engineering R-Reports	Materials Multidisciplinary	Science,	10.032
Y	Bulletin Of The American Mathematical Society	Mathematics		3.647
N	Journal Of The American Mathematical Society	Mathematics		2.457
Y	Communications On Pure And Applied Mathematics	Mathematics		2.250
Y	Nature	Multidisciplinary Sciences		30.979
Y	Science	Multidisciplinary Sciences		29.162
Y	Proceedings Of The National Academy Of Sciences Of The United States Of America	Multidisciplinary Sciences		10.272
Y	Birth-Issues In Perinatal Care	Nursing		1.709
Y	Advances In Nursing Science	Nursing		1.625
Y	Nursing Outlook	Nursing		1.169
Y	Reviews Of Modern Physics	Physics, Multidisciplinary		28.172
N	Physics Reports-Review Section Of Physics Letters	Physics, Multidisciplinary		11.980
Y	Reports On Progress In Physics	Physics, Multidisciplinary		8.409
Y	Progress In Polymer Science	Polymer Science		7.759
N	Advances In Polymer Science	Polymer Science		6.955
Y	Macromolecules	Polymer Science		3.621
Y	Annual Review Of Psychology	Psychology		9.896
Y	Psychological Bulletin	Psychology		8.405
Y	Psychological Review	Psychology		8.357

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