

IMPACT FACTOR AS WE KNOW IT HANDICAPS NEUROPSYCHOLOGY AND NEUROPSYCHOLOGISTS

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A journal impact factor (IF) is calculated as the ratio between the number of citations in a given year to any item published in that journal in the previous two years and the number of research items published in the same journal in the same two years (Garfield, 2001). Several potential pitfalls of IF have been pointed out (see Discussion Forum in *Cortex*, issue 37, no. 4, 2001). Still IF is widely acknowledged as the standard measure for scientific quality; the higher the IF, the more prestigious the journal, and, by inference, the more prestigious are the articles published in that journal, and the authors of these articles. Intrinsic in this quality judgement should be the criterion that journals be compared within disciplines, and not across them. However, in this era of multidisciplinary, journals which publish articles from sibling disciplines compete to intercept good quality papers.

IF, as it is currently calculated, may favour some journal/disciplines and penalise others. In particular, since the two-year window places great emphasis on current research, slow-moving fields will be greatly

penalized when compared to fast moving topics. These slow-moving disciplines would fare much better were the citation interval longer. Neuropsychology, a typical slow-moving discipline, is a case in point. Neuropsychology papers are published in mainstream neuropsychology journals as well as in clinical neurology journals or neuroscience journals, which however also publish articles from fast-moving disciplines (e.g., basic neuroscience, neurophysiology, molecular biology, neuroimaging).

Table I shows the IF of five neuroscience journals and five neuropsychology journals (for years 2003 and 2004) selected by asking colleagues attending a European conference to name the five journals from each discipline that sprang to mind.

It appears that IF is higher for the neuroscience than for the neuropsychology journals. Therefore, to avoid being penalised when their c.v. is compared with colleagues from other disciplines competing for the same positions, or to boost their research assessment exercise output, neuropsychologists would submit their best papers

TABLE I
Impact Factor (two year window) and Cited Half Life of (a) five "neuroscience" and (b) five "neuropsychology" journals for years 2003 and 2004

| A) NEUROSCIENCE | | | | |
|--|--------------------|----------------------|--------------------|----------------------|
| Journal | 2003 Impact Factor | 2003 Cited Half-life | 2004 Impact Factor | 2004 Cited Half-life |
| Brain | 7.967 | 7.1 | 8.201 | 7.2 |
| Human Brain Mapping | 6.058 | 5.2 | 4.815 | 5.6 |
| Journal of Cognitive Neuroscience | 5.069 | 5.1 | 5.275 | 5.1 |
| Journal of Neuroscience | 8.306 | 5.3 | 7.907 | 5.6 |
| NeuroImage | 6.192 | 3.3 | 4.869 | 3.5 |
| <i>Average</i> | <i>6.7</i> | <i>5.2</i> | <i>6.2</i> | <i>5.4</i> |
| B) NEUROPSYCHOLOGY | | | | |
| Journal | 2003 Impact Factor | 2003 Cited Half-life | 2004 Impact Factor | 2004 Cited Half-life |
| Cognitive Neuropsychology | 2.317 | 7.6 | 2.746 | 7.9 |
| Cortex | 2.000 | 11.0 | 2.472 | 11.0 |
| Neuropsychologia | 2.695 | 8.3 | 3.668 | 8.3 |
| Neuropsychology | 2.027 | 6.2 | 2.357 | 6.7 |
| Journal of Clinical and Experimental Neuropsychology | 1.273 | 9.4 | 1.367 | 9.8 |
| <i>Average</i> | <i>2.1</i> | <i>8.3</i> | <i>2.6</i> | <i>8.5</i> |

Note. The cited half-life for Cortex for both years is recorded in ISI journal citation reports as >10; a (conservative) value of 11 was therefore used in calculating means, SDs and effect sizes.

TABLE II
Independent samples *t*-tests comparing neuropsychology and neuroscience journals in terms of mean impact factor (IF) and mean cited half-life (HL); effect sizes (Cohen's *d*) are also reported

| Index | Neuropsychology | | Neuroscience | | <i>t</i> | <i>p</i> | <i>d</i> |
|---------|-----------------|------|--------------|------|----------|----------|----------|
| | Mean | SD | Mean | SD | | | |
| IF 2003 | 2.06 | 0.52 | 6.72 | 1.37 | 7.10 | .001 | 4.50 |
| HL 2003 | 8.50 | 1.82 | 5.20 | 1.35 | 3.26 | .011 | -2.06 |
| IF 2004 | 2.52 | 0.83 | 6.20 | 1.70 | 4.34 | .005 | 2.75 |
| HL 2004 | 8.74 | 1.68 | 5.40 | 1.32 | 3.49 | .008 | -2.21 |

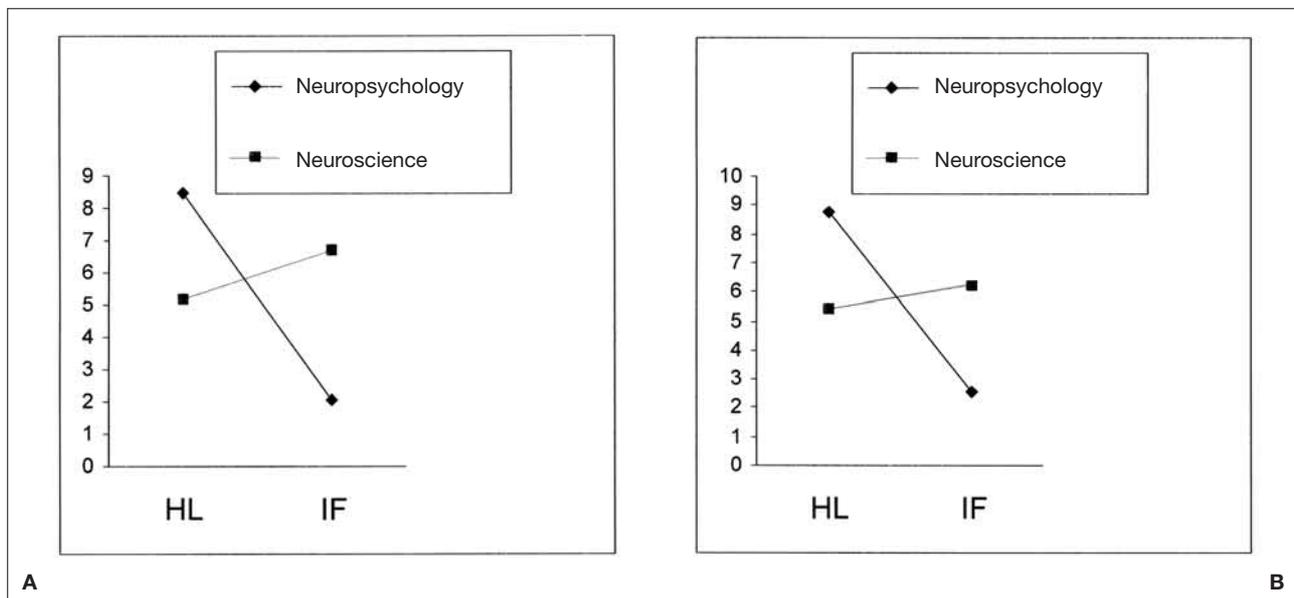


Fig. 1 – A double dissociation (crossover interaction) between Impact Factor and Cited Half-Life between neuropsychology and neuroscience journals for (a) year 2003 (i.e., citations in 2003 for papers published in 2001-2) and (b) year 2004 (i.e., citations in 2004 for papers published in 2002-3).

to non neuropsychology journals. Moreover, libraries, basing their ranking on IF, will prefer to subscribe to non neuropsychology journals.

However, the other columns in Table I report the data from another quality measure published yearly by ISI alongside IF, namely the Cited Half-Life (HL). The cited half-life is the age range of 50% of the journal's cited articles (ISI Web of Knowledge, 2005), i.e. it is a measure of citation survival, the more a paper continues to be cited over the years the higher the HL. This measure of long-lasting quality favours neuropsychology journals over neuroscience journals.

We calculated Cohen's *d* (an index of effect size) for the difference between neuropsychology and neuroscience journals for IF and HL. Both effect sizes for 2004 data can be classified as very large using Cohen's (1988) criteria. Moreover, independent samples *t*-tests comparing mean IF and mean HL are both significant (Table II). The equivalent data from 2003 yielded a virtually identical pattern of results. The resulting crossover interactions are illustrated graphically in Figure 1.

Neuropsychology journals are greatly handicapped compared to journals from sibling disciplines by adopting a two-year window rather than a longer interval as the standard citation time. The result of casually accepting a measure which severely penalises our discipline may have unwanted practical consequences. We appreciate that when studied within disciplines the journal rankings based on different number of years IF do not differ significantly (Garfield, 2001). Yet, this logic would not apply to multidisciplinary disciplines, hence we propose that a longer citation interval (e.g., 5-year window interval) should be adopted when evaluating the quality research output in neuropsychology.

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