Do shorter Cortex papers have greater impact?

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One way of analysing the impact of academics, articles or journals is to examine their citation rates (Aksnes, 2003, Fowler & Aksnes, 2007, Della Sala & Grafman, 2007, 2009). Indices of citation rates include Immediacy Index, which reflects the number of times articles published within a given year were cited during that year divided by the total number of articles published in that journal that year, and Impact Factor, which reflects the total number of articles published over a 2-year-period were cited during the following year divided by the total number of articles published in the same journal in the same 2-year-period. However, the current methods used to calculate such citation rates, such as that by the Institute of Scientific Information, have been criticized for their vagueness (see Foley & Della Sala, 2010), openness to manipulation (Brumback, 2009; Foley & Della Sala, 2010) and bias towards faster moving disciplines (Della Sala & Crawford, 2006, 2007; Della Sala & Grafman, 2009).

Recently, another possible bias has emerged, the difference in citations between longer and shorter articles. Longer papers may reflect deeper thinking and greater clarity (Haslam, 2010) than shorter papers, but they have also been criticized as being over-long (Park, 2009) and inaccessible (Taylor, 2009).

Haslam (2010) examined the publications from three major psychology journals (Psychological Science, Cognition and Journal of Experimental Social Psychology) for number of citations and length of article. He found that although longer articles received on average more citations, shorter articles received more citations per page than longer articles. Thus, the relative impact of shorter articles was higher than that of longer articles.

Haslam’s claim implies therefore that it is convenient for journals to publish shorter papers, as this is likely to increase their performance indexes. However, as both the Immediacy Index and the 2-year Impact Factor are calculated by dividing number of citations by number of total articles published, reducing the word limit of papers (whilst maintaining the same number of pages overall), could increase the denominator in both measures, hence possibly lead to a decrease of citation rates.

In this paper, we examine how article length of papers published in Cortex affects citation rates within the same year and the year following publication.

We have excluded from this analysis Letters, Editorials and all other special items which although short are clearly conveying a different kind of information. All peer-reviewed research papers and all review articles published in Cortex in 2009 and 2010 were included in the analysis. Articles were labelled as “short” or “long” by splitting their total number of pages using their median.

In 2009 and 2010, a total of 201 research articles and reviews were published in Cortex. This comprised 107 articles published in 2009, covering 1010 pages, and 94 in 2010, covering 1040 pages. For the 2 years, the 201 articles consisted of 89 ‘short’ (59 in 2009 and 30 in 2010) and 112 ‘long’ articles (48 in 2009 and 64 in 2010; see Table 1). Overall, the mean length of all articles was 10.20 pages [standard deviation (SD) = 3.58; range = 4–22]. The mean length of the 89 short articles was 7.07 pages (SD = 1.44, range = 4–9) and 12.69 pages (SD = 2.71, range = 10–22) for the 112 long articles.

The 107 articles published in 2009 received a total of 235 citations that year, and 613 in 2010, accruing a total of 848 citations within 2 years. Interestingly, the citation rates reflect an increase of 260.85% in citations in the year following publication. The 59 short articles published in 2009 received 114 citations that year, and 252 in 2010, thus only accruing an extra 221.05% of citations in 2010. In 2010, the 94 articles comprised 30 short articles, which received 56 citations in 2010, and 64 long articles, which received 161 citations. There was no significant difference between the short and long
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articles in the total number of citations received in 2009 ($U = 1399.00, p = ns$) or 2010 ($U = 1399.00, p = ns$), nor within the number of citations the short and long articles published in 2010 received that year ($U = 814.00, p = ns$).

Similarly, for articles published in 2009, there was no overall correlation between length of article and number of citations received in either 2009 ($\rho = -.04, p = ns$) or 2010 ($\rho = .02, p = ns$). Neither was there a significant correlation between length of articles published in 2010 and number of citations received that year ($\rho = .15, p = ns$).

When number of citations was divided by number of pages, the short articles published in 2009 received an average of .31 citations per page in 2009, and .90 in 2010, whereas the long articles published in 2009 received an average of .20 citations per page in 2009 and .44 in 2010. The short articles published in 2010 received an average of .28 citations per page and the long articles received .20 citations per page. The short articles published in 2009 received proportionally more citations than the long articles in 2009 ($U = 1071.00, p < .05$) and 2010 ($U = 506.00, p < .05$), but with no significant difference in citations per page between the short and long articles published in 2010 ($U = 736.00, p = ns$).

Although short and long articles received the same number of citations, short articles gathered proportionally more citations per page than the long articles in the year following publication. This supports Haslam’s findings that shorter publications have greater relative impact per page than longer ones. However, this does not necessarily translate to greater performance indexes, as Haslam’s argument implied.

Consider the following hypothetical situation: if 10 long papers with an average of 10 pages each get 100 citations, they will result in an Impact Factor of 10, which is one per page. Now suppose that 10 short papers of five pages on average, get 50 citations in all, they will get half of the citations of the longer articles, i.e., five each versus 10 each, but the same value per page, i.e., one per page. However, to fill the journal pages one will need a greater number of shorter articles, hence increasing the number of overall items published. So, in this example, suppose that the journal has in total 1000 pages in a year, this results in 100 long articles versus 200 short articles, therefore the total number of citations received will be divided by 100 in case of the long but by 200 in case of the short. So, in our example, the 100 long papers will get 1000 citations, resulting in an Impact Factor of 10, whereas the 200 short papers will also get 1000 citations, resulting though in an Impact Factor of 5. The “per page” citation argument contains a possible flaw as to the increase of Impact Factor if short papers are published. In fact this would be true only if the advantage of citations per page exceeds the cost of increasing the number of source items.

Now, let us scrutinise some real data, we will use the 613 2010 citations of the 2009 short ($n = 59$) and long ($n = 48$) articles as an example. These 59 short articles covered a total of 418 pages, whereas the 48 long articles covered a total of 592 pages in Cortex 2009. The 59 short articles received 361 citations the following year versus the 252 citations of the 48 long articles. Hence, the shorter papers did indeed receive a greater ratio of citations (361/59 = 6.12, vs 252/48 = 5.25; $U = 506.00, p < .05$). Also, within the time window considered, in total, shorter papers covered less Cortex pages than the longer ones. Thus, Haslam’s claim is correct: short papers are more quoted per page, but this translates into an Impact Factor advantage only if the more citations per page accrued by short papers overwhelm the cost of increasing the number of source items in the denominator.

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