

Literature Citations in the Internet Era

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J. A. Evans's report "Electronic Publication and the Narrowing of Science and Scholarship" (18 July, p. 395) suggests that (i) the average age of citations to scientific papers dropped over the years as more electronic papers became accessible and (ii) the citations are concentrated on a smaller proportion of papers and journals. Such conclusions are not warranted by Evans's data. To measure the evolution of the average (or median) age of the references contained in papers, one has to look at all the references in all published papers and observe the evolution of their age over time. As we have shown using Thomson Reuters's Web of Science data for the period 1900 to 2004 (for a total of 500 million references in 25 million papers), the average (and median) age of all references began to decrease in 1945 but has increased steadily since the mid-1960s. This trend is visible in all sciences, including the social sciences and the humanities (1, 2). The median age of references in fields of science and engineering moved from 4.5 years in 1955 to more than 7 years in 2004, and in medical sciences it increased from 4.5 to 5.5 during the same period (1). In fact, Evans's conclusions only reflect a transient phenomenon related to recent access to online publications and to the fact that the method used does not take into account time delays between citation year and publication year. Our data also show that in disciplines in which online access has been available the longest (such as nuclear physics and astrophysics), the age of references declines for a number of years in the 1990s but then increases from 2000 to 2007, the last available year of our data set. We have also measured the concentration of citations (and journals) by three different methods, including the one used by Evans. All three measures clearly show that concentration is in fact declining for papers as well as for journals (3). Although many factors affect citation practices, two things are clear: Researchers are increasingly relying on older science, and citations are increasingly dispersed across a larger proportion of papers and journals.

References

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