Authorship, scholarship and ergonomics

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Dans Le Travail Humain 2009/4 (Vol. 72), pages 397 à 403
Éditions Presses Universitaires de France

ISSN 0041-1868
ISBN 9782130573258
DOI 10.3917/th.724.0397

Article disponible en ligne à l'adresse
https://www.cairn.info/revue-le-travail-humain-2009-4-page-397.htm

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RÉSUMÉ

AUTEURS, PUBLICATIONS ET ERGONOMIE

Publier est un enjeu majeur pour les universitaires, les chercheurs et les auteurs. Alors qu’il est normal que le travail de recherche réalisé soit reconnu, la question de la paternité du texte et du rang des auteurs d’une publication reste difficile à résoudre. Au cours des dernières années, on peut constater une augmentation alarmante des publications comportant un nombre important d’auteurs. Toutefois, il semble que les revues d’ergonomie aient résisté à cette tendance. Différentes méthodes ont été élaborées pour évaluer l’activité de publication des auteurs mais aucune ne fait consensus. Au-delà de la méthode qui est finalement choisie pour procéder à cette évaluation, clarté, transparence et impartialité sont finalement nécessaires pour retrouver les fondamentaux éthiques de la publication scientifique.


INTRODUCTION

Scientific journals originated from meetings of the Royal Society in England and the Royal Academy in France, where new discoveries were read aloud and later published as a summary of proceedings (Guidotti, 2006). Scientists who could not attend these meetings would send a letter outlining their experiments and discoveries for their peers to scrutinise (Smith, 2008a). The publication of research findings has always represented a key component of research performance and its importance to the academic community has been noted for many years. In his 1894 inaugural address as President of the Texas Academy of Sciences, for example, George B. Halsted stated how original research and creative
Authorship is the “essence” of university teaching (Halsted, 1895). General medical journals began at the end of the 18th century (Smith, 2006), and within 100 years, scientific publication had become a way of life for the research scholar. Journal articles now represent the endpoint of a scientific process where information is incorporated into the working body of knowledge and thereby makes an author’s work more widely available for the scientific community to scrutinise and evaluate (Pearson, 1981).

**AUTHORSHIP VERSUS SCHOLARSHIP**

Authorship represents a contentious issue in modern academia as it implies accountability and independence (Davidoff et al., 2001). Scholars write articles for a variety of reasons and they usually have several goals when publishing; goals which may be simple or complex (Fye, 1990). As early as 1925, reasons such as the desire to contribute something to medical knowledge and the desire to extend one’s reputation, had been mentioned in the medical literature. Important research findings will always have their place in science and the people involved in this process should clearly be recognised. On the other hand, however, a research paper “does not exist through wizardry alone” (Horton, 1997), and rarely do all authors contribute to a paper in equal amounts (Sekercioglu, 2008). This then raises the question of exactly who qualifies for authorship. The lead author position is usually reserved for the individual making the largest contribution, followed sequentially by those with progressively less input. The last author position is often used for individuals who made little direct contribution to the project, but deserve some honour nevertheless (Laurance, 2006).

In certain circumstances, junior researchers may feel pressured to invite esteemed scholars to be co-authors, even those who have made little significant input. In some cases, projects with large amounts of data may legitimately list programmers as authors (Phibbs, 1996). Minor contributions abound, however, and there have subsequently been calls to exclude contributions such as formatting, proof reading, being a Head of Department, providing access to specialist equipment, preparing diagrams, entering data or providing ad hoc statistical advice (D’Auria, 1997). Similarly, tasks such as “holding the door open while rats are brought into the laboratory” does not constitute authorship (Smith, 1996). Some leading journals now encourage authors to list the specific contributions they made to a paper (Rennie, Flanagan, & Yank, 2000). While openness and transparency is clearly a key element in scientific ethics, not all scholars qualify for the author credit they obtain.

MULTIPLE AUTHORSHIP

Multiple authorship represents a contentious issue for modern academia and contemporary journal editors. On one hand, publications are essential for many researchers to maintain their own credibility and standing within the academic community (Rawbone, 2009). Researchers are being increasingly compelled to expand their CV with as many publications as possible. Quite simply, the more articles someone has, the more productive they are assumed to be (Greene, 2007). On the other hand, this may lead to unnecessary and unworthy author credit for scholars who have contributed relatively little. Multiple authorship incurs numerous problems for journals and the institutions in which their authors work (Kennedy, 2003), although it is not a new phenomenon. As early as 1958, McConnell stated that the listing of any more than three authors was “not justifiable” and minor specific contributions could simply be recognised in the Acknowledgements section. He also suggested how justification for the use of more than three authors’ names appeared to be the “accumulation of bibliographical credit for minor contributions” (McConnell, 1958). A trend away from individual investigators in favour of research teams had also become apparent during this time (Alexander, 1953).

According to Greene (2007), while any current issue of Nature still contains about the same number of articles as it did back in 1950, it lists around four times as many authors. Analysis conducted by the Institute for Scientific Information (ISI), now Thomson Reuters, has quantified the inexorable decline of single authors over the past 20 years. In 1981, for example, there were fewer than 50 articles listing 50 or more authors, but by 1994, this figure had climbed to around 400 (King, 1995). In 1997 there were 602 articles with 50 or more authors. In the year 2000, 324 articles listed over 100 authors (King, 2004). The number of articles with 500 authors or more increased from 40 in 2003 to 131 in 2005 (King, 2007). In the year 2000 an article published in the Lancet contained 918 authors (HOPE, 2000). In 2004 an article was published in Circulation Journal with 2,438 authors1 followed by an article in Physics Reports during 2006 which contained 2,512 authors2. The average number of authors per article has also been rising, from 1.8 in 19553, to 2.6 in 1990, and then to 3.6 in 2003 (King, 2004).

This seemingly continuous rise in multiple authorship is alarming, as superfluous authorship endangers the entire author credit system (Greene, 2007), and extra authors often serve only to “dilute” intellectual property, particularly among junior scientists (Tarnow, 1999). The cor-

rect listing of manuscript contributors appears to be a considerable challenge (Peh & Ng, 2009). Clearly, therefore, it is important to clarify who has done what, given that authors rarely contribute to a paper in equal amounts (Sekercioglu, 2008). Any citation metric that assumes otherwise, and thus treats all author contributions equally, is inherently unfair (Sekercioglu, 2009). Having a standardized method for the quantification of contributions is clearly needed in modern academia.

**AUTHORSHIP AND ERGONOMICS**

Encouragingly, journals in the field of ergonomics and human factors do not appear to be overloaded with multiple authors. One way to investigate this is to examine a bibliometric database, such as the *Science Citation Index*® (*sci*®). In 1995 (King, 1995) and 2004 (King, 2004), for example, lists of multiauthor articles in the fields of medicine, physics, biomedicine and physical sciences were published in *Science Watch*. According to Dul and colleagues (2004), there are six key journals in our field: *Human Factors, Applied Ergonomics, Ergonomics, the International Journal of Industrial Ergonomics, Le Travail Humain* and *Human Factors and Ergonomics in Manufacturing*. All six are included in the *sci*® and feature in the *Journal Citation Reports*® (*jcr*®) published annually by Thomson Reuters. Impact factors, a measure of how frequently a journal’s articles are cited following publication (Smith, 2007), are calculated each year for these six ergonomics periodicals. Analysis of these measures can provide some interesting insights (Smith, 2008b). A search of the *sci*® using the *Web of Science*® database reveals that of the 10 most highly-cited articles published in ergonomics journals, half (50%) listed a single author, 20% listed two authors, a further 20% listed 7 authors and 10% had four authors.

The most highly-cited article in the ergonomics field, Kuorinka and colleagues’ (1987) paper describing a standardised Nordic questionnaire for the analysis of musculoskeletal symptoms, had 7 authors. Of the ten most highly-cited articles ever published in *Le Travail Humain*, 70% listed two authors, with the remaining 30% being single author journal articles. The most highly-cited article from *Le Travail Humain*, a 1983 paper by Warr and Jackson (1984), only had two authors. Similarly, when examining the most recent full year of publication in *Le Travail Humain* (2008), it can be seen that 53% of all articles listed two authors, 20% had three authors and 13% were single author publications. Only two articles published in 2008 (Lefeuvre *et al.*, 2008; Poizat *et al.*, 2008) had four or more authors. Compared to certain other fields such as clinical medicine and physics, therefore, it would appear that ergonomics and human factors journals are currently resisting the trend for multiauthor papers.
THE WAY FORWARD

Like it or not, publishing is a fact of life for researchers (Vollmer, 2007). Just as cautious deliberation is at the heart of the scientific process (Smith & Guidotti, 2008), honest and equitable authorship should be at the heart of the publication process. Scientists have an absolute obligation to honesty (Alberts, 2008). Not all individuals in the research process qualify for authorship, and journals need to agree on key criteria for deciding who should be an author, who should be acknowledged, and those who should remain unlisted. But how does one compare “backache, versus headache versus heartache?” (Hunt, 1991). A few different methods for defining authorship have already been proposed. Hunt (1991), for example, described an “Authorship Index” whereby a certain number of points were awarded for certain activities, such as data capture, specialist input and so on. An individual whose total score exceeded a threshold value was accepted as an author, with author position ranked according to their score. Sekercioglu (2008) proposed a calculation whereby the $k^{th}$ ranked author contributes $1/k$ as much as the first author. Verhagen and colleagues (2003) have proposed the “QUAD System” where authorship is based on four categories: conception and design, data collection, data analysis and conclusions and manuscript preparation. According to Horton (1997), a better model would be to consider the investigator-editor relationship as a contract. Rennie and colleagues (1997) have further suggested that one or more contributors should guarantee the integrity of the entire work.

Perhaps another way forward may be to introduce a set of uniform requirements for manuscripts submitted to journals in the field of human factors and ergonomics. Instigating such a process may take time, however. Although uniform requirements for manuscripts submitted to biomedical journals were proposed over 30 years ago, such policies still do not exist in many of the smaller medical subdisciplines (Smith & Takahashi, 2007). Regardless of the method chosen to address this issue, openness, transparency and fairness in authorship clearly need to return to the forefront of publishing and scientific ethics.

REFERENCES


Authorship, scholarship and ergonomics


ABSTRACT

Authorship represents a contentious issue for modern academics, researchers and journal editors. While individuals should clearly be recognised for the work they do, agreement on who should be included as an author and at what rank, remains difficult to achieve. In recent years there has been an alarming rise in publications with significant numbers of authors, although encouragingly, ergonomics journals appear to have so far resisted this trend. Various methods have now been proposed for establishing author credit, although no Uniform Requirements have yet been agreed upon. Regardless of the method which is ultimately chosen to address this issue, openness, transparency and fairness in authorship clearly need to return to the forefront of publishing and scientific ethics.

Key words: Publishing, Authorship, Ergonomics, Scientific journals.

Paper received: July 2009.

Accepted by A. Lancry in modified form: August 2009.