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LETTER

# Multiple First Authors as Equal Contributors: Is It Ethical?

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The recent article titled "Evaluation by citation" by Maarten van Wesel (2016) outlines the thorny ethical dilemma driving the "publish or perish syndrome" that promotes scientific shortcuts leading to ethical misconduct. When I started writing papers three decades ago at the Smithsonian Institution in the United States, we were taught by senior scientists on the ethics of scientific writing that precisely outlined specifics on how to list co-authors in papers based on their actual contributions. What I understood then was that those who are engaged in designing, collecting and analyzing data in fact prepare the paper and they usually take the lead role in authorship while the research adviser being a mentor and senior scientist accepts the responsibility of corresponding authorship. The corresponding author's duty involves overall accountability for the paper that includes crosschecking data factuality, ethical implications and communication with the journal's editorial office. Others who participate in the paper are listed as 2nd, 3rd, and 4th respectively, based on their authentic contributions. This ethical tradition of allocating authorship has been increasingly replaced in recent years by multiple authors taking credit for first authorship based on the criterion of "equal contributors".

Although the ethically-contentious multiple authorship debate in scientific publication has started nearly two decades ago (Rennie et al. 1997; Smith 1997), writers often maintain the status quo where the first and the last (corresponding) authors hold the actual authority for scientific/ethical responsibility and recognition

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involving a published paper. We now live in a globalized world where a single scientist doing independent research work leading to single-authored research papers in high impact journals has become a rare occurrence. Collaborations and partnerships have become a way of life in scientific research, be it the journal publication industry or the patent registration industry (Wagner and Leydesdorff 2005; Ma et al. 2009). Competition to get grants, promotions, awards, and other perks including the overall science kudos has increased enormously for scientists. As a result, more than one scientist in a collaborative paper is motivated to take the first authorship credit that eventually leads to creation of the baffling phrase, "equal contribution". Journals are dependent on authors for their contributions; without them, their products cannot be marketed to the target audience. Therefore, journals adopt and also adapt to the new creations involving stars, asterisks, crosses, double/triple crosses and other strange signs to denote authorship.

Since the 1990s, there has been an increasing growth in the number of papers in which more than one author claims first authorship using the equal contributor criterion in several journals covering the science and engineering fields. Initially, it started with two authors claiming the first authorship. I was shocked when I saw a paper published in the *Plant Journal* in 2014 (impact factor 5.972) where six authors (out of total 14) had claimed the first authorship with a cross sign asterisk that referred to a statement that 'these authors contributed equally to this work' (http://onlinelibrary.wiley.com/doi/10.1111/tpj.12676/pdf). The cross-signed statement is so small that readers may need a magnifying glass to have a good look at it clearly. It indicates that even the journal may not like readers to see this statement at first sight. If this trend continues, it's a matter of time before all authors may claim first authorship in all papers. To make the ethical crisis worse, some argue that it's time to recognize the co-first authorship in journals as a reality facing the scientific journal industry since many researchers desperately depend on it to get promotions, grants, awards and other monetary benefits (Conte et al. 2013).

But the question is, would it be possible and practical for several authors to equally contribute in a single research paper? If so, what are the scientifically-testable measures and variables that journals can use to authenticate this far-fetched claim? Without analyzing the underlying ethical concepts and consequences of multiple authors taking credit for co-first authorship, why do journals continue to publish the ethically-questionable papers? Although some leading journals such as *Nature* and *Science* ask authors to provide details on their individual contributions in a multi-authored paper, they seldom authenticate the authors' actual contributions. Why? It goes beyond the journals' and editors' ability to make such an intensive and time-consuming examination. Therefore, journals take the statements of the authors on face value since scientists are supposed to uphold ethical values and integrity. So, where does ethics stand in this confusing authorship accountability saga?

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