

High readership on academic social platforms could poorly reflect conservation interest

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Abstract Social media are being used increasingly by the science community to share research output with a wide audience and to seek feedback. They are also used as alternatives to the traditional citation-based assessment of the impacts of scientific products and even to inform employment decisions in academia. One of these media platforms, ResearchGate, is a popular application with more than 20 million users who share and discuss scientific products. We report on a remarkably high level of interest in one of our publications on ResearchGate about the Eurasian wild pig *Sus scrofa* in Iran, a poorly studied species in a conservation priority region. The number of reads of our publication was c. 1,500 times higher than the mean per publication for scientists from a range of American and Asian universities. Comparison with other ResearchGate statistics and reader feedback indicates these reads resulted from data-gathering processes unrelated to the details of the research. Although this raises questions regarding the ability of ResearchGate and similar platforms to measure research interest and impacts reliably, we use the popularity of our article as an opportunity to advocate for conservation research in an understudied region and on an understudied species.

Keywords Article influence, bibliometrics, biodiversity conservation, Iran, research bias, ResearchGate, social media, Suidae

In 2011 we co-authored a short article describing morphological variation amongst wild pigs *Sus scrofa* from Iran (Meijaard & Moqanaki, 2011). The article was published in *Suiform Soundings*, the specialist newsletter of the IUCN Species Survival Commission Wild Pigs, Peccaries, and Hippos Specialist Groups. It included a map of South-west Asia (Central Intelligence Agency, 1996) and nine photos of *S. scrofa*. The article was made available on the website

of *Suiform Soundings* in December 2011 and a copy of the article was uploaded to ResearchGate, a popular scientific research-sharing website, in 2015.

The current (December 2022) number of ‘reads’ (i.e. accesses) for the article is 74,991, of which 74,346 (99%) were read by non-ResearchGate members and only 365 resulted in reads of the full text. By comparison, the mean number of reads per publication from ResearchGate-listed users based in American universities varied in one study between 37.6 and 42.3 depending on the type of university, and the mean reads per publication for ResearchGate users from 21 top Chinese research universities was 32.8 (Yan & Zhang, 2018). Another study based on the same dataset but comparing different scientific disciplines found a mean of 38.4 reads per publication in life sciences and biomedicine (Yan et al., 2021). Our total reads of 74,991 is also much higher than the mean reads of 943.7 of 150 articles that were amongst the 10 most cited articles in a journal ranked amongst the top 10 in communication research (Wasike, 2021). The high number of reads of our Iranian wild pig article is in stark contrast with its low number of citations, which, in December 2022, stood at one on ResearchGate and three on Google Scholar; i.e. 0.08–0.24 citations per year. We note that the number of reads is positively correlated with the ResearchGate Score (Copiello & Bonifaci, 2019), a measure of scientific reputation based on the contributions, interactions and reputation of an individual researcher (Yu et al., 2016). We also note that although ResearchGate reads are sometimes considered an alternative social media metric to assess research interests, the Score, amongst other ResearchGate metrics, is criticized for its lack of transparency, irreproducibility and redundancy (Kraker & Lex, 2015; Nicholas et al., 2016; Copiello, 2019; ResearchGate, 2022).

The high number of reads of this article, published in a specialist publication and on a narrow topic, raised our suspicion as to whether this truly reflected research interest in the subject. On 4 February 2019, Meijaard (2019a) therefore posted a question on ResearchGate that asked whether the reads of the Iranian wild pig paper were genuine reads or whether bots (i.e. software applications that run automated tasks) or internet search-related tools were involved that were generating statistics to indicate that the paper was read. We received 51 answers, including ‘... this is by far most likely to be a bot problem ...’ and ‘... you are probably right to assume that there hasn’t been a sudden scholarly spike in academic interest in Iranian boar populations ...’. One respondent commented that ‘ResearchGate counts

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each view of figures as one read, and as the article has a map and several photos of the animal, probably every person who views it already counts as approximately 10 reads'. In relation to the latter answer, we note that the map from the article is currently the top image search result on Google Search when using the keyword search term 'Southwest Asia', which links to the ResearchGate page for the Iranian wild pig article. This could constitute anecdotal evidence supporting the notion that miscellaneous internet searches resulted in the high readership of the article. We do not know the details of the processes and algorithms that resulted in our map being the top-ranked Google Search result in this context.

In response to the answers, Meijaard (2019b) tested the hypothesis that the connection with Iran and, more broadly, some of the countries that frequently appear in the international media could have caused this interest. Meijaard (2019b) uploaded an article on ResearchGate with the title: 'Determining the presence of great apes in Iraq, Iran, Syria, Lybia [sic] and North Korea'. The two-page article described the reasoning behind the publication, noting that great apes do not occur in these countries, and included the same map of South-west Asia used in the original article on Iranian wild pigs. This spoof article did not receive a particularly high number of reads: 1,359 by December 2022, of which 1,154 (85%) were by ResearchGate members. This is much lower than the reads of the Iranian wild pig article, but still considerably higher than mean values reported for research from US and Chinese institutions (Yan & Zhang, 2021; Yan et al., 2021). We note that the amusing title could have attracted readers, and our various questions and answers on this topic could have created specific interest amongst our ResearchGate followers. Nevertheless, Meijaard (2019a) concluded in his response to the ResearchGate community that the presence of a map or particular keywords, such as the names of prominent countries in the international media or the reference to iconic, conservation-dependent great apes in these countries, could increase the attention given to publications, but these do not fully explain the high reads garnered by the Iranian wild pig paper.

Our findings indicate that, firstly, the high visibility of a particular scientific topic on public platforms does not always mean genuine interest in that topic or in its authors. We do not know how frequently such biases occur on ResearchGate or similar platforms. Nevertheless, our experience is important because there is increasing interest in using social media metrics as alternatives to citation-based assessments of the impacts of scientific products and even in employment decisions in academia (Elmore, 2018; Merga et al., 2020; Araujo et al., 2021). Popular academic social networking sites such as ResearchGate are leading this change through their various impact metrics (Meier & Tunger, 2018; ResearchGate, 2023; but see

Copiello, 2019). Although there seems to be some correlation between publicity around articles on social media platforms and future citations (Lamb et al., 2018; Araujo et al., 2021), our experience indicates that in some cases high apparent visibility has little to do with public or scientific interest. It would be of particular concern if manipulation of social media metrics was possible, thereby allowing individual authors to boost their standing. This concern is reflected in calls to be more cautious regarding the use of social media metrics, such as the various scores available on ResearchGate (Nicholas et al., 2016; Copiello, 2019). We believe that the high readership of our article on Iranian wild pigs is probably the result of unrelated internet-based searches and does not reflect genuine research interest. We leave it to the reader to decide how this insight could be used to increase the number of people viewing or reading their online articles.

Secondly, the wild pig in Iran is a neglected species that needs more research and conservation attention. Pigs are ecologically important but knowledge regarding their management remains poor, especially in Asia (Melletti & Meijaard, 2017). Furthermore, Iran is a country of major conservation importance, being home, for example, to more species categorized as threatened on the IUCN Red List than any other country in West and Central Asia except Turkey and Yemen (IUCN, 2022). The zoological literature of Iran is rich compared to that from other countries in the region (Anderson, 2002; Yusefi et al., 2019), and Iranian scientists are producing increasing numbers of publications on the fauna and flora of Iran and contributing to regional and international conservation science and practice. However, decades of political isolation and economic sanctions have made long-term international collaborations difficult (Adab et al., 2016). In addition to funding limitations and some restrictions on collaboration, the unpredictability of the relationship of Iran with the international community, and global foreign policy, has sometimes posed a major risk to Iranian researchers with international contacts (Khalatbari et al., 2018). For the time being, we believe it is improbable that wild pig conservation will become a priority area of research in Iran. Nonetheless, research has been published on Iranian wild pigs in recent years (e.g. Khalilzadeh et al., 2016; Ashrafzadeh et al., 2018), and although the focus has been on *S. scrofa* as a source of zoonotic infections (e.g. Maleki et al., 2020), knowledge of Iranian wild pigs has nevertheless improved. Thus, in conclusion, although we realize that the attention received by our article on Iranian Suidae does not reflect genuine conservation science interest in either pigs or Iran, we appreciate the opportunity it has given us to highlight these important conservation topics. We hope that as a result, the science community will further increase its interest in conservation research in general and wild pig research specifically both in Iran and in other understudied parts of South-west Asia.

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Conflicts of interest None.

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