Tracking the digital footprints to scholarly articles: the fast accumulation and rapid decay of social media referrals

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Academics are increasingly encouraged to share their scholarly articles via social media, as part of a wider drive to maximize their dissemination and engagement. But what effect does this have? **Xianwen Wang** *has studied the referral data of academic papers, with particular focus on social media referrals and how these change over time. Referrals from social media do indeed account for a significant number of visits to articles, especially in the days immediately following publication. But this fast initial accumulation soon gives way to a rapid decay.*

PeerJ, an open access, peer reviewed scholarly journal, provides data on the referral source of visitors to all of its article pages. This is quite unique as such data is not available on other publisher or journal websites. These metrics are updated on a daily basis following an article's publication, meaning for the first time we are able to track the digital footprints to scholarly articles and explore people's visiting patterns.

In our previous study examining referral data collected from *PeerJ*, social network platforms were proven to be among the top referral sources. Social media directs many visitors to scholarly articles. In our more recent study, we used the daily updated referral data of 110 *PeerJ* articles collected over 90 days (22 January – 20 April 2016) to track the temporal trend of visits directed by social media.

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Twitter and Facebook account for most social media referrals

During our observation period, 19 February was the first day on which all 110 sample articles had visiting data, with 20 April being the last day of the research period and the point at which all papers in our sample had been published

for at least 60 days. According to the findings of our study, article visits directed by social referrals account for more than 12% of all visits (as shown in Figure 1). Twitter and Facebook are the two most important social referrals directing people to scholarly articles; between them accounting for more than 95% of all social referrals. Individually Twitter and Facebook were roughly equivalent to one another, each falling within the 42-54% range.
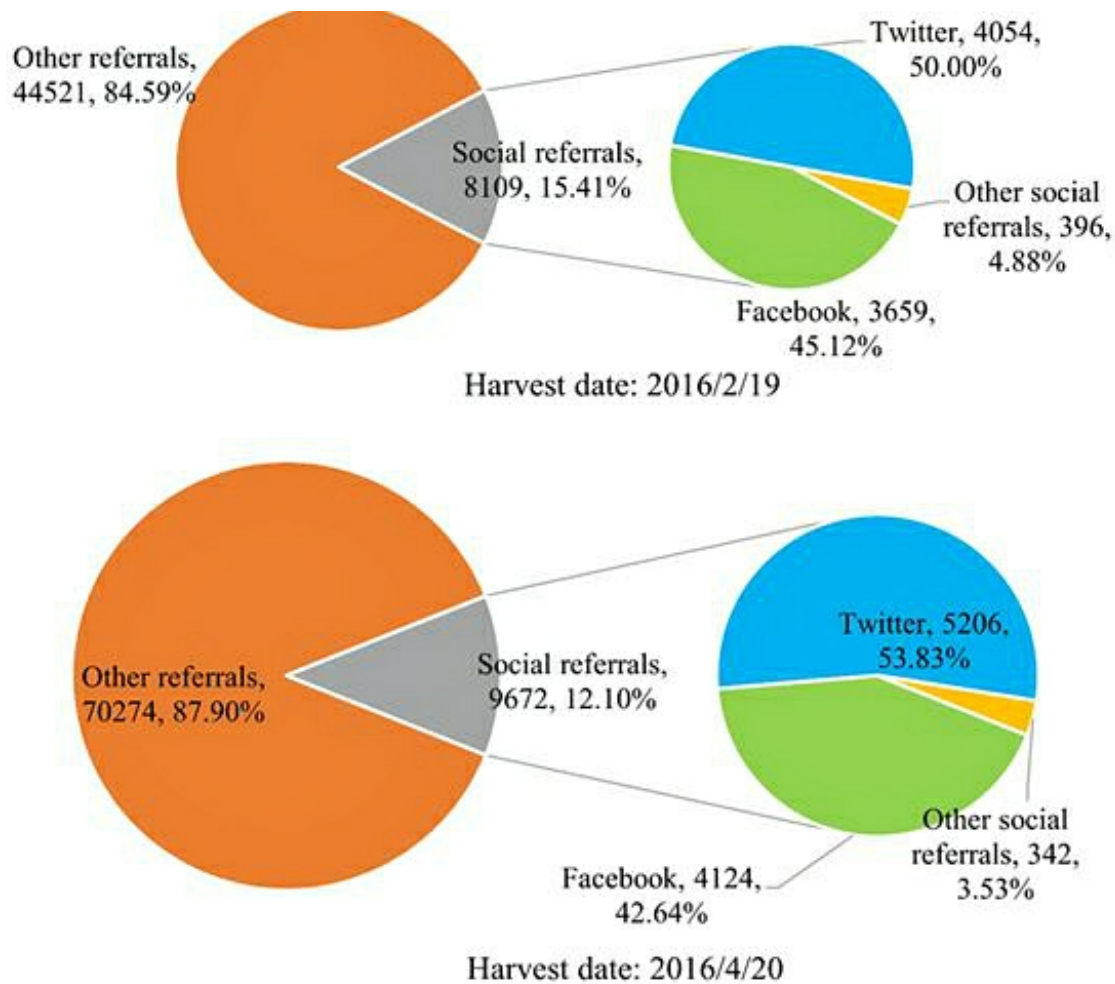

Figure 1: The proportion of article visits from social referrals on two specific days. Source: Wang et al, (2016). Tracking the digital footprints to scholarly articles from social media, *Scientometrics*. **© Akadémiai Kiadó and republished here with permission.**

Attention from social media: "easy come, easy go"

To track temporal trends in what percentages of total visits to articles could be accounted for by social media referrals, the daily visiting data of each article were grouped according to the publish–harvest interval days (the number of days from publication to data being recorded). The visiting dynamics analysis (Figure 2) shows an obvious overall downward temporal trend in the proportion of all visits originating from social media. Where papers had been published for just one day, social referrals accounted for 20% of all visits. After 90 days, this percentage falls to only 9%.

Overall, during the initial period following a scholarly article's publication, social attention comes very quickly. In most cases, visits from social media are much faster to accumulate than visits from other referrals, with most of those visits directed by social referrals being concentrated in the few days immediately following publication. About 77% of the visits from social media are generated in the first week after publication. However – "easy come, easy go" – social buzz around scholarly articles doesn't last long, leading to a rapid decay in the article visits from social
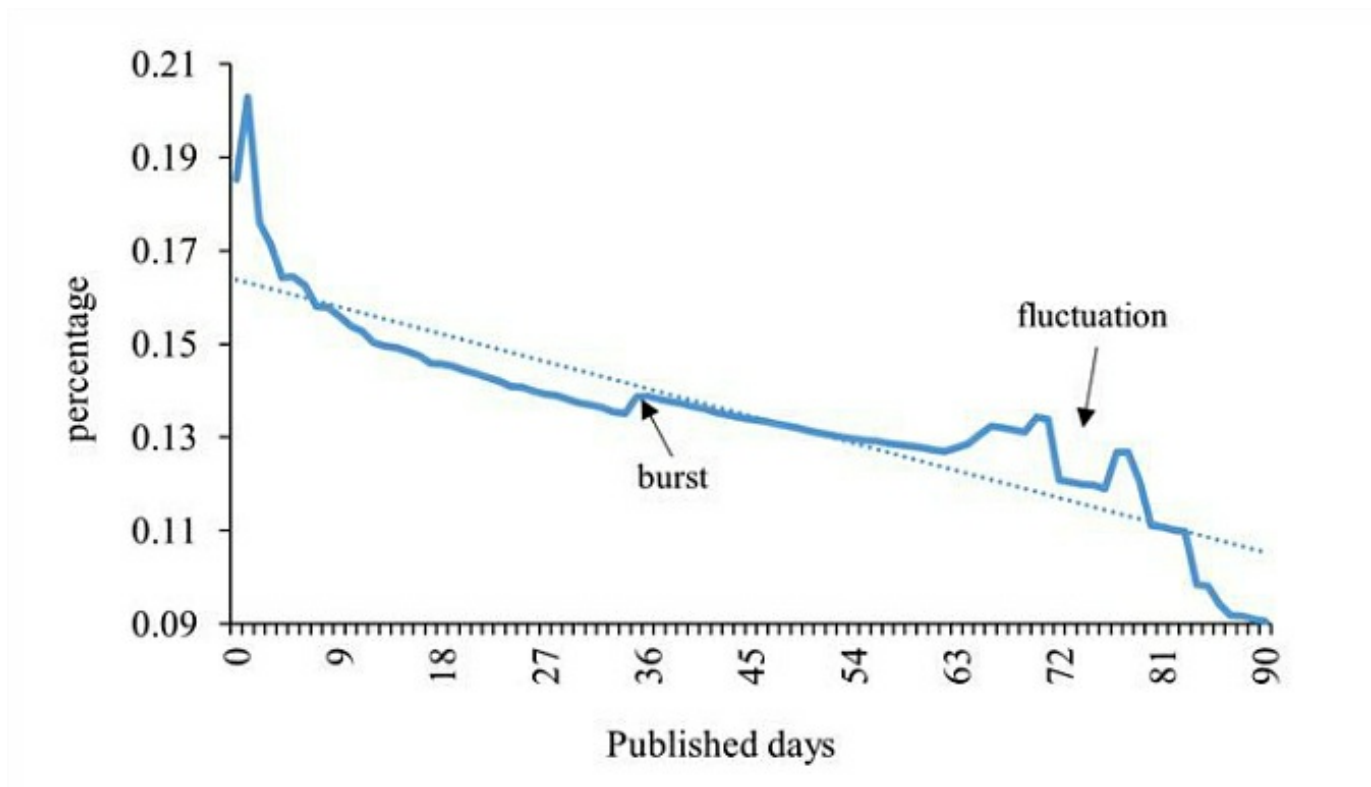
referrals.

Figure 2: Temporal trend of the proportion of visits from social media in the total visits. Source: Wang et al, (2016). Tracking the digital footprints to scholarly articles from social media, *Scientometrics*. © Akadémiai Kiadó and republished here with permission.

The role of social buzz in directing people to scholarly articles can be illustrated by a specific example. As shown in Figure 2, a small but noticeable increase occurs at the middle part of the curve. We reviewed the data and discovered that this small burst is attributable to a jump in visits from Twitter to paper 1605. Paper 1605 was published on 2 February 2016. To 6 March, the number of article visitors directed by Twitter had reached 381. On 7 March, a particularly influential Twitter account (with 1.97 million followers) tweeted about the paper. That tweet was retweeted 11 times on the same day and is the reason the number of article visitors from Twitter rose dramatically from 381 to 751 in only a few days.

The fluctuation visible towards the end of the curve is caused by the vast decrease in the number of samples with sufficiently long time windows (in number of days since publication).

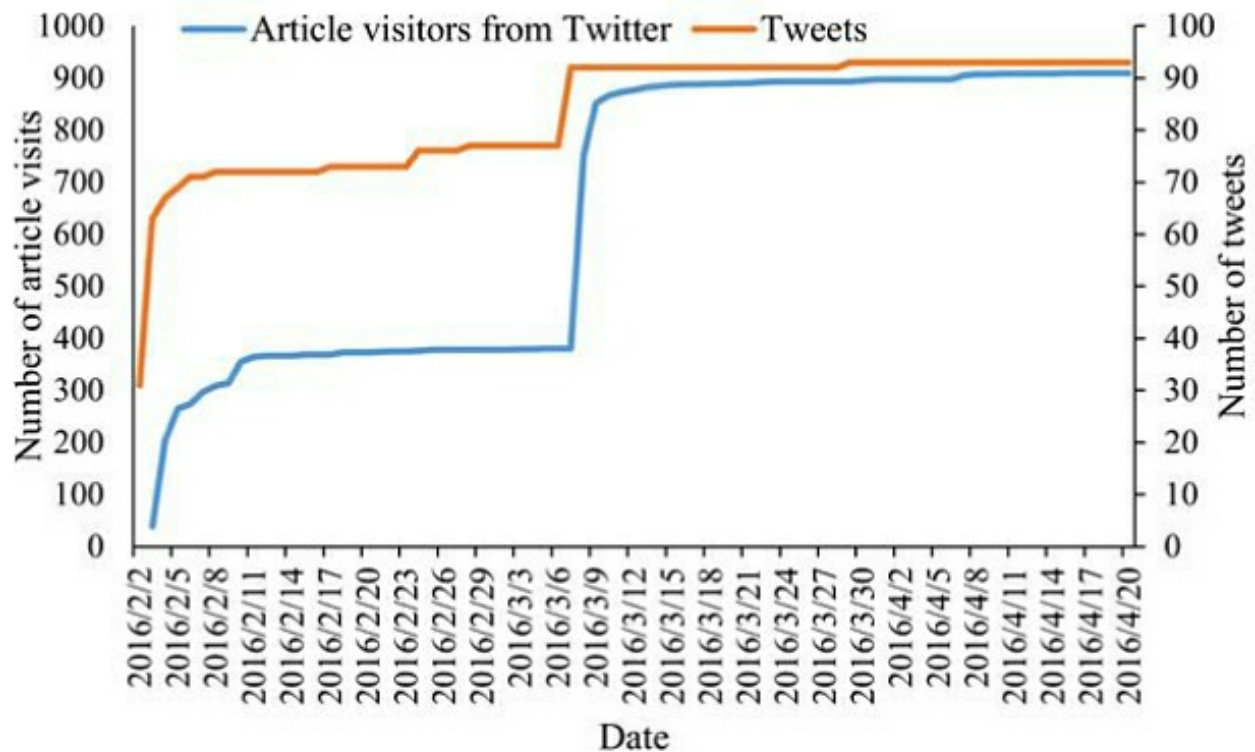**Synchronism between the number of tweets and article visitors from Twitter**

Figure 3: Synchronism of temporal trend of tweets and their procured visits for the paper 1605. Source: Wang et al, (2016). Tracking the digital footprints to scholarly articles from social media, *Scientometrics***. © Akadémiai Kiadó and republished here with permission.**

The synchronism of the growth in the number of tweets and that in article visitors from Twitter testifies partially that social mentions do direct people to read scholarly articles, although we don't know who is directed by which tweet. Article visitors from social referrals may be researchers, students, or even the general public. However, it does prove that the public attention on social media can be transformed into the real clicks on scholarly articles.

This blog post is based on the author's co-written article, 'Tracking the digital footprints to scholarly articles from social media', published in Scientometrics (DOI: 10.1007/s11192-016-2086-z).

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