

# Not just nickel-and-dime: An analysis of journal articles winning Ig Nobel prize during 2011–2020

Andy Wai Kan Yeung

Oral and Maxillofacial Radiology,  
Applied Oral Sciences and Community Dental Care,  
Faculty of Dentistry, University of Hong Kong, Hong Kong, CHINA  
e-mail: ndyeung@hku.hk  
ORCID: A.W.K. Yeung: 0000-0003-3672-357X

## ABSTRACT

*Ig Nobel prize is a satirical award given to achievements that are unusual, imaginative, and frequently produced in the form of journal articles. It was largely unknown how these award-winning articles were disseminated in the community in terms of academic citations and social media attentions. This study evaluated all journal articles winning the award during the period of 2011–2020 for their citation and social media performance metrics. There were 89 Ig Nobel prize-winning journal articles indexed by Scopus. On average, they were cited  $42.5 \pm 102.4$  times, published in journals with mean impact factor of  $3.476 \pm 4.102$ , and mentioned  $947.3 \pm 2887.2$  times and  $263.2 \pm 502.7$  times on Facebook and Twitter, respectively. Over half of them were published in the first quartile journals and awarded within 2 years since publication. Though Ig Nobel prize was originally intended to be satirical, prize-winning articles themselves were indeed impactful in the academia.*

**Keywords:** Ig Nobel prize; Citation analysis; Altmetrics; Satiric prize; Award-winning articles.

## INTRODUCTION

Winning the Nobel prize is considered one of the greatest honors that can be achieved by a scientist. Simultaneously, the Nobel prize is also a frequently covered topic in the academic literature. A quick Scopus search within “article title” field (Nobel prize\*) yielded more than 3430 papers mentioning the phrase “Nobel prize\*” on 29 March 2022. For instance, a citation analysis was conducted on Nobel prize-winning economists, and found that nearly 40 percent of them demonstrated a symmetrical bell-curve in terms of temporal changes in citations with the peak around the time of the Nobel award (Bjork, Offer, and Söderberg 2014). The coincidence of citation peak with award winning was similarly observed in the fields of chemistry and physics (Gingras and Wallace 2010). Winning a Nobel prize could not only boost the citations of oneself, but also attract citations to other references belonging to the same research theme (Frandsen and Nicolaisen 2013). These findings were not always unanimous, as methodological artifacts might exist and need to be accounted for (Farys and Wolbring 2017). Nonetheless, the above examples illustrated the interest of the academia on the relationship between citation accumulation and Nobel prize winning.

On the other hand, the Ig Nobel prize is a satiric award given to achievements (not restricted to academic) that are unusual and imaginative (see <https://improbable.com/ig/about-the-ig-nobel-prizes/>). The Ig Nobel prize has been awarded annually since 1991, and is considered as “arguably the highlight of the scientific calendar” (Pilcher 2004). A quick Scopus search on 29 March 2022 yielded 17 documents mentioning the phrase “Ig Nobel prize\*” in their titles. These were basically short documents that summarized who and what were awarded with the prizes without in-depth scientific investigations. For example, short news articles on *Nature* that interviewed Ig Nobel prize winners and briefly described their award-winning research works (Nadis 1998; Woolston 2014).

It was largely unclear if journal articles that won the Ig Nobel prize were making an impact in the academia by publishing in high impact journals and receiving many citations. Meanwhile, it was reasonable to expect that many of these articles would receive multiple social media mentions, because they could be perceived as funny and eye-catching enough to win the prize. However, it was unclear if the articles received these mentions equally and if the mentions were associated with citations. This study aimed to evaluate if there existed associations for these metrics. The following questions drive this study:

- (a) How many citations did Ig Nobel prize winning articles gain on average; and
- (b) Did citation of Ig Nobel prize winning articles correlate with Facebook and Twitter mentions?

## MATERIALS AND METHODS

The official website of the Ig Nobel Prize (see <https://www.improbable.com/ig-about/winners/>) was accessed in June 2021. Journal articles winning Ig Nobel prize over the last ten years (2011–2020) were included if they were indexed by Elsevier's abstract and citation database Scopus. The following parameters were recorded for each of the articles: award-winning year, actual publication year, journal impact factor (JIF) in the publication year, JIF quartile, Scopus citation count, Field-Weight Citation Impact (FWCI), total number of Shares, Likes & Comments from Facebook, and number of Tweets from Twitter. The JIF data were extracted from Clarivate Analytics' Journal Citation Reports (JCR) (<https://jcr.clarivate.com/>). As a limitation of the subscription of the content, JIF data prior to 1997 was unavailable. Citation count and FWCI were extracted from Scopus (<https://www.scopus.com/>). Please note that Scopus did not provide FWCI data for old publications, such as those published prior to 2000. Facebook and Twitter data were provided by PlumX Metrics (<https://plumanalytics.com/>) embedded in Scopus.

Statistical analyses were performed with IBM SPSS Statistics 26.0. Pearson's correlation tests were performed to evaluate if there existed linear correlations in the JIF, citation, and social media data with publication year. Tests with  $p < 0.05$  were considered statistically significant.

Data are deposited at <https://doi.org/10.6084/m9.figshare.16632826>. This study involves no animal or human subjects, so ethical approval was not needed.

## RESULTS

There were 89 journal articles indexed by Scopus that won the Ig Nobel prize during 2011–2020 (please note that some of them might have already been published before this period). They were cited between 1 to 940 times ( $M = 42.5$ ,  $SD = 102.4$ ). FWCI ranged from 0.10–14.59 ( $M=1.8$ ,  $SD=2.2$ ). JIF ranged from 0 – 30.432 ( $M=3.476$ ,  $SD=4.102$ ). Number of Facebook mentions were between 0 – 19778 ( $M=947.3$ ,  $SD=2887.2$ ). Number of Twitter mentions were between 0 – 3069 ( $M=263.2$ ,  $SD=502.7$ ). Years of delayed recognition (years between publication and winning Ig Nobel prize) were from -2 to 38 ( $M=6.7$ ,  $SD=9.0$ ) (Table 1). Over half of the 89 articles were awarded within 2 years since publication. Note that the -2 years came from (Yang et al. 2021) which was awarded the prize in 2019 and subsequently published as a full paper in 2021 (its earliest form was a conference abstract presented in late 2018). There was a broad spectrum of award categories, with the largest category being Medicine ( $n = 18$ ). Among the categories with at least 3 articles, the highest mean citation category was Psychology (140.8 citations per article), and the highest mean social media attention was Biology (Facebook: 3726.5 mentions, Twitter: 808.3 mentions) (Table 2).

Table 1: Years Between Publication and Winning an Ig Nobel Prize.

Years of delayed recognition	N
-2	1
-1	1
0	14
1	20
2	9
3	8
4	0
5	2
6–10	11
11–15	11
16–20	2
>20	10

Table 2: Award Categories of the 89 Ig Nobel Prize-Winning Journal Articles

Category	N (% of 89)	Citation (mean ± SD)	FWCI (mean ± SD)	Facebook mentions (mean ± SD)	Twitter mentions (mean ± SD)
Medicine	18 (20.2%)	24.1 ± 23.5	1.1 ± 0.7	551.3 ± 992.6	147.5 ± 214.4
Physics	9 (10.1%)	21.2 ± 24.0	1.6 ± 1.3	292.8 ± 497.4	158.7 ± 215.2
Psychology	8 (9.0%)	140.8 ± 323.7	1.9 ± 1.7	463.0 ± 627.5	253.8 ± 450.3
Biology	6 (6.7%)	26.5 ± 26.2	0.9 ± 0.6	3726.5 ± 7884.6	808.3 ± 876.3
Economics	5 (5.6%)	14.6 ± 10.1	0.8 ± 0.7	292.8 ± 211.1	270.6 ± 430.3
Chemistry	4 (4.5%)	52.3 ± 47.1	2.1 ± 2.3	61.0 ± 94.2	95.8 ± 31.0
Public Health	4 (4.5%)	74.5 ± 64.7	1.5 ± 0.7	150.5 ± 230.7	73.0 ± 118.2
Nutrition	3 (3.4%)	38.3 ± 39.6	3.0 ± 2.7	522.3 ± 321.8	164.7 ± 190.2
Peace	3 (3.4%)	99.0 ± 63.5	5.5 ± 3.4	1426.7 ± 2450.3	139.3 ± 121.1

Categories with only two papers were as follows: anatomy, medical (medicine) education, physiology & entomology, and reproduction. Categories with only one paper were as follows: acoustics, anthropology, archaeology, arctic science, art, biology & astronomy, cognition, diagnostic medicine, entomology, fluid dynamics, management, materials science, mathematics, neuroscience, obstetrics, perception, physiology, probability, and reproductive medicine.

Meanwhile, the most cited article was Strack, Martin, and Stepper (1988) (940 citations; Fritz Strack; Germany; 2019 Ig Nobel Prize in Psychology), an article reporting that subjects found cartoons significantly funnier if they held a pen between their teeth (which facilitated smiling) than between their protruded lips (which prevented smiling). The article reported two similar experiments based on 92 and 83 subjects respectively, and the result was revoked (not replicated) by a subsequent replication study with 1894 subjects (Wagenmakers et al. 2016).

The article with highest Facebook mentions was Hart et al. (2013) (19778 mentions; Vlastimil Hart, Petra Nováková, Erich Pascal Malkemper, Sabine Begall, Vladimír Hanzal, Miloš Ježek, Tomáš Kušta, Veronika Němcová, Jana Adámková, Kateřina Benediktová, Jaroslav Červený and Hynek Burda; Czech Republic, Germany, and Zambia; 2014 Ig Nobel Prize in Biology), an article that reported observations from 70 dogs about their defecation (1893 times) and urination (5582 times). It concluded that dogs preferred to excrete with their body aligned along the North-South axis of the Earth's magnetic field, which was not observable when the magnetic field was unstable.

Moreover, the most highly Tweeted article was Eren et al. (2019) (3069 Tweets; Metin Eren, Michelle Bebbler, James Norris, Alyssa Perrone, Ashley Rutkoski, Michael Wilson, and Mary Ann Raghanti; USA and UK; 2020 Ig Nobel Prize in Materials Science), which tested and revoked the claim that knives manufactured from frozen human faeces could be functional for cutting, based on two knife designs and faeces from two subjects.

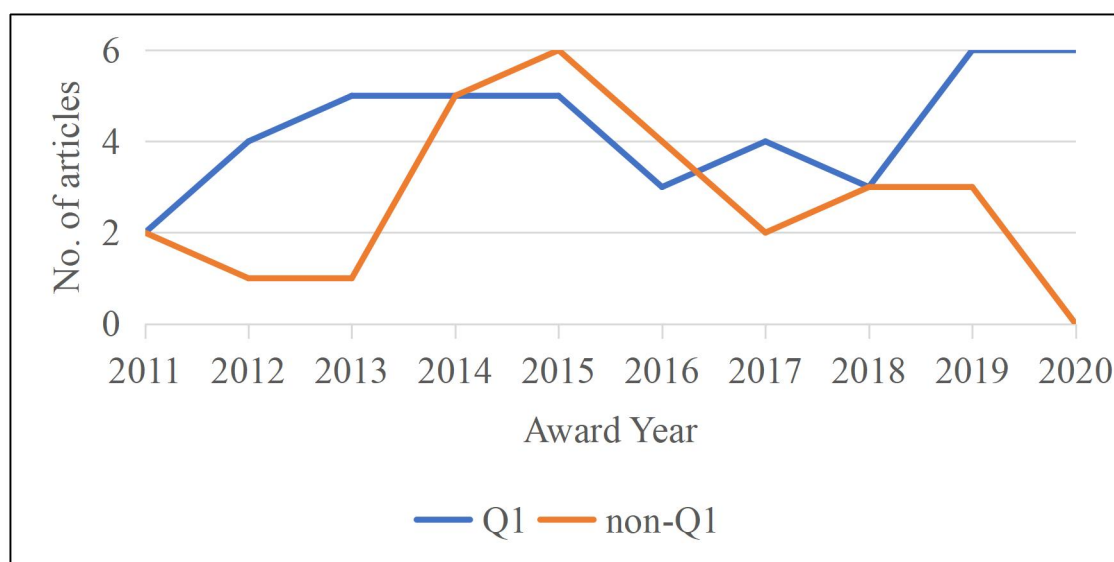
Finally, the article with the longest delayed recognition was Barry, Blank, and Boileau (1980), (38 years since its publication, John Barry, Bruce Blank, and Michel Boileau; USA, Japan, Saudi Arabia, Egypt, India, and Bangladesh; 2018 Ig Nobel Prize in Reproductive Medicine). It introduced a test that involved 4 pieces of postage stamps to differentiate if male subjects were having complete nocturnal erections for the evaluation of impotence.

Table 3 lists the correlation results between the parameters. The award year was only positively correlated with Twitter mentions ( $r = 0.247$ ,  $p = 0.020$ ). Citation count was positively correlated with years of delayed recognition, JIF, and FWCI, but not with social media mentions. Finally, Facebook and Twitter mentions showed a strong positive correlation ( $0.806$ ,  $p < 0.001$ ). Nearly half of the 89 articles ( $n = 43$ ) were published in Quartile 1 journals according to JIF quartile (Figure 1).

Table 3: Relationship between Year, Citation, and Social Media Parameters

	Years of delayed recognition	Journal impact factor	Citation	Field-Weight Citation Impact	Facebook mentions	Twitter mentions
Award year	r = 0.090 p = 0.402	r = -0.094 p = 0.410	r = 0.026 p = 0.806	r = -0.079 p = 0.498	r = 0.054 p = 0.613	r = 0.247 <b>p = 0.020</b>
Years of delayed recognition		r = 0.023 p = 0.844	r = 0.307 <b>p = 0.003</b>	r = -0.174 p = 0.133	r = -0.157 p = 0.142	r = -0.233 <b>p = 0.028</b>
Journal impact factor			r = 0.320 <b>p = 0.004</b>	r = 0.076 p = 0.516	r = -0.048 p = 0.673	r = -0.007 p = 0.951
Citation				r = 0.702 <b>p &lt; 0.001</b>	r = -0.043 p = 0.691	r = -0.088 p = 0.414
Field-Weight Citation Impact					r = -0.018 p = 0.876	r = -0.080 p = 0.490
Facebook mentions						r = 0.806 <b>p &lt; 0.001</b>

Figure 1: Number of Articles Published in the First Quartile (Q1) According to Journal Impact Factor (JIF)



## DISCUSSION AND CONCLUSIONS

This study, for the first time, showed that many journal articles winning the Ig Nobel prize indeed had their own scientific merits, instead of generally being taken with a pinch of salt. For example, half of them were published in Q1 journals, cited multiple times, and had >1.0 FWCI implying a higher-than-average citation impact in their respective field or niche areas.

Previous studies on specific journal(s) reported some mild to moderate positive correlations between Twitter mentions and citation counts (Xia et al. 2016; Zhang, Blazar, and Earp 2021). Besides, by analyzing social media data from Altmetric, it was found that Twitter contained much more article mentions than Facebook (Mullins, Boyd, and Corey 2020; Nocera et al. 2019). Neither of these phenomena was observed in this study. Perhaps it partly related to the different samples

examined. It also depended on the tweeting behavior of the Twitter users involved. A prior study suggested that only <10% of tweets represented curating and informing about state-of-the-art, otherwise the majority was “almost entirely mechanical and devoid of original thought, no evidence of conversation, tweets generated by monomania, duplicate tweeting from many accounts under centralized professional management, and tweets generated by bots” (Robinson-García et al. 2017). Meanwhile, another study classified Twitter users into four categories, disseminators, influential users, common users, and hidden influential users (Liang et al. 2019). Whether a topic would go viral or not might depend on the composition of the retweeting users (Liang et al. 2019). Here, the Ig Nobel prize was likely to attract a burst of mentions of the awarded articles through the social media within a short period of time due to the satirity and absurdity promoted by the prize. However, academic citations might not be accumulated in the same speed, especially that citations often take time whereas these articles were often awarded the prize within two years of publication. Therefore, the discussion here was not intended to probe into the underlying mechanisms of the relationship between citation count and social media attention. Rather, the key message here was that the Ig Nobel prize-winning articles were well-received in the academia with their own scientific merits, instead of being viral online but without any scientific impact.

The current study had some limitations. The analyzed literature set was relatively small, meaning that the findings might not be generalized to a broader literature. Subgroup analyses regarding each award category were not performed due to their small sample sizes. Articles winning the award prior to 2010 were not included, because it was reasoned that sharing and commenting on journal articles through social media was probably less common in the old days, given that the number of Twitter-focused research papers rose significantly since the beginning of the 2010s (Williams, Terras, and Warwick 2013).

In conclusion, Ig Nobel prize-winning journal articles received not only large numbers of Facebook and Twitter mentions, but also considerable number of citations. However, social media attention did not show correlation to citations. Half of the articles were published in Q1 journals in terms of JIF, and they covered a wide range of topics in various research fields. Though originally intended to be satirical, Ig Nobel prize-winning articles were indeed impactful.

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