Discouraging Honorific Citation

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ABSTRACT

The paper presents a study on analysis of citations made in the introduction section of articles that report empirical research. The attempt is to proceed with the validation that pertinence of citations in scientific articles is a core problem in citation analytics. Citations made in the introduction sections of research articles published in Nature weekly journal were studied. The entire research articles published from Volume 523 to 527 were studied. The result showed that the mean pertinence for the entire study is about 32%. Overall, about 68% of citations made in the introduction sections may not be applicable in the computation of effective impact of publications. It forms one of the first attempts to use empirical methods to determine pertinence of citations in scientific publications. Here in, the rationale for the study is identified

Keywords: Content Analysis; Content pertinence; Performance evaluation; Impact Factor; Novelty; Citation analysis

INTRODUCTION

The journal publication system has been identified to play a very important role in the science social system. Cronin[1] identified that the perceived role and importance of the system is considerable and includes ensuring the preservation of standards and screening of knowledge added to the literature. It is also believed that the publication process forms the basis for the allocation of scientists' rewards and recognition when their work is published or cited. Price,[2] laid the foundation of the present reward system in the science social system, where citation is regarded as a means to distribute credits/recognition to the published scientists.

Although the use of citation analytics for this purpose is very vast,[3] however, it has also been advised that citation analytics should be used with caution.[4-6] Specifically, the following were identified as problems of citation analytics:

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erroneous computation of citation based impacts;[4] Problematic results due to variable coverage of search engines as well as their availability in international bibliometric data bases.[7] They can be directly or subtly gamed and manipulated by the editor through coercive citation or by the author through self citations.[8] Adedayo,[9-11] also indicated that, because citations are not always generally positive, it is possible that the present usage of citation analytics, to implicitly allocate rewards and recognition to counterproductive efforts. Studies have been published to discourage honourific reward allocation.[6,9,12]

Also, it has been proposed by Cawkell[13] that the citation analytics would work better, only if every citing author meticulously cited only the earlier works pertinent to theme of the new manuscript. Particularly, Adedayo,[14-16] identified that oftentimes, not all cited references express the same opinion with the manuscript where they are cited. If the issue of pertinence is adequately settled, then coercive and self citations would become of little or no significance.

In this particular article, an empirical investigation to study pertinent citations in the introduction sections of articles published in Nature, the weekly international journal of science published by Nature Publishing Group is presented. The idea presented in the report is very fresh, and original! It forms one of the first attempts to use empirical methods to determine pertinence of citations in scientific publications. Herein, the rationale for the study is identified

Methodology

Citation pattern in Research Articles published in Nature was studied. The weekly international journal, Nature, publishes different forms of articles such as: News & Views Articles, Research Article, Research Letters etc. Only citations in Research Articles were studied. Citation pattern in publication issues from Volume 523, Number 7560 to Volume 527, Number 7577 was studied. All Research Articles within this range were studied. A systematic cull of citation in the articles, as suggested and described by Adedayo[6,15,16] was adopted. Citations in the articles were classified as citations with Real and Imaginary Pertinence.[11,16] Citations made in Introduction sections were considered as Citations with Imaginary Pertinence while those made in the Methodology/Results/Discussion of Result/Conclusions are considered to have Real Pertinence. Citations made in the Methodology/Results/Discussion of Results/Conclusions are classified as Real Citations, because these truly show that the cited source support the new research being reported, and thus is pertinent to the reported study. Citations made in the Introduction sections are classified as Imaginary Citations. This because, any citation made in the Introduction that cannot be cited in the Methodology/Results/Discussion of Results/Conclusions can only be stated to have imagined pertinence to the study. The pertinence is only a figment in the imagination of the citing author.

The total number of authors cited in the Introduction sections were counted and recorded as N_c. Also, a counting of common citations made both in the Imaginary and the Real sections was made, and recorded as n_c. Pertinence (p) of the Imaginary section (Introduction section) of each article was determined by finding the ratio n_c: N_c expressed as a percentage i.e.

$$p = 100 \left(\frac{n_c}{N_c} \right) \qquad (1)$$

The average Pertinence, N_c, and n_c for the journal publication in a particular volume was determined. The overall averages for the journal entire study were also determined.

RESULTS AND DISCUSSION

Tables 1 to 5 present the results for the study. Table 1 provides information on citation distribution of Introduction section in articles published in Volume 523 of Nature. From the table, the highest pertinence observed is 43%, with N_c of 42 and n_c of 18. The lowest pertinences were 0%. The averages for the volume are pertinence of 32.5%, N_c of 21.2 and n_c of 7. Table 2 provides the citation distribution in Volume 524. The highest pertinence observed is 100%, with N_c of 10 and n_c of 10. The lowest pertinence is 23% with N_c of 22 and n_c of 5. The averages for the volume are pertinence of 50.1%, N_c of 19.8 and n_c of 9.6. Table 3 provides the distribution for Volume 525. The highest pertinence observed is 62%, with N_c of 21 and n_c of 13. The lowest pertinence is 0%. The averages for the volume are pertinence of 30.7%, N_c of 18.7 and n_c of 6.3. Table 4 shows citation analytics for Volume 526. The highest pertinence observed is 78%, with N_c of 9 and n_c of 7. The lowest pertinence is 6%, with N_c of 34 and n_c of 2. The averages for the volume are pertinence of 30.5%, N_c of 18.1 and n_c of 5. In Table 5, we see the citation distribution for Volume 527. Highest pertinence observed is 47%, with N_c of 17 and n_c of 8. The lowest pertinence is 9%, with N_c of 23 and n_c of 2. The averages for the volume are pertinence of 19.45%, N_c of 28 and n_c of 4.9.

Figure 1 presents the cumulative frequency distribution of pertinence for the study, while Figure 2 gives overview of pertinence distribution with frequency. By determining the upper quartile in Figure 1, it is clear that over 75% of the articles have pertinences below 50%. This shows that majority of citations made in the introduction section of the articles studied have not validly supported the reported study. In Figure 2, only articles with pertinences less than 65% have shown frequencies ≥ 2. Figure 3 gives the frequency distribution of N_c for the study. Here, it is shown that the most frequent N_c lies within the range 5-35. Within this range, N_c have mostly frequencies ≥ 1. Figure 4 presents the frequency distribution of n_c within the articles analyzed. Frequencies were high for low n_c values. These decreased down the line. From here, it could be surmised that the probability of finding article with higher n_c decreases.

Overall the average pertinence for the study is found by calculating the mean for the average pertinences for all the issues analyzed i.e.

$$p_m = \frac{p_{vol.523} + p_{vol.524} + p_{vol.525} + p_{vol.526} + p_{vol.527}}{5}$$

Where pm is the mean of the average pertinences for all the issues analyzed.

$$p_m = \frac{(32.5 + 50.1 + 30.7 + 30.5 + 19.4)\%}{5}$$

Table 1: Citation distribution in articles published Volume 523

S/N	Journal Name	Journal Issue	Published Year	Article Page	N_c	Common citation	n_c	P(%)
1.	Nature	Vol. 523, No. 7560	2015	301	12	Refs. 9, 10, 11, 12	4	33
2.	"	"	"	308	23	Nil	0	0
3.	"	"	"	313	18	Refs. 6, 9, 18	3	17
4.	"	Vol. 523, No. 7561	"	419	14	Refs.: 1,3,4,5,6,7,8,9,10,11,13	12	86
5.	"	"	"	425	12	1,7,8	3	25
6.	"	"	"	431	42	Refs.:5,6,7,8,9,25,27,28,29,30,31,32,33,34,35,36,37	18	43
7.	"	Vol. 523, No. 7562	"	543	21	Refs.:3,6,7,9,8,12,15,16,17,18,20	11	52
8.	"	"	"	550	15	Nil	0	0
9.	"	"	"	555	29	Refs.:9,16,17,18,20,22,23,24,25,26,27	11	38
10.	"	"	"	561	26	Refs.:2,8,11,14,15,22,23,26	8	31
		Average for the Journal Volume 523			21.2		7	32.5

Table 2: Citation distribution in articles published Volume 524

S/N	Journal Name	Journal Issue	Published Year	Article Page	N_c	Common citation	n_c	P(%)
1.	Nature	Vol. 524, No. 7563	2015	47	10	Refs.:1,2,3,4,5,6,7,8,9,10	10	100
2.	"	"	"	54	22	Refs.:1,6,11,12,13,14,17,20,22	9	41
3.	"	"	"	59	19	Refs.:1,4,5,6,7,9,10,11,12,19	10	53
4.	"	Vol. 524, No. 7564	"	180	13	Refs.:3,5,6,10,11,12,13	7	54
5.	"	"	"	186	30	Refs.:5,7,8,9,11,12,13,14,15,16,17,18,19,20,21,23,26,27,30	19	63
6.	"	Vol. 524, No. 7565	"	303	22	Refs.:9,11,15,19,20,22	6	27
7.	"	"	"	309	11	Refs.:1,2,5,6,7	5	45
8.	"	"	"	315	19	Refs.:1,11,12,13,17,19	6	32
9.	"	Vol. 524, No. 7566	"	427	30	Refs.:1,2,3,4,5,6,9,11,13,14,18,19,21,22,23, 24,25,27,29	19	63
10.	"	"	"	433	22	Refs.:14,17,20,21,22	5	23
		Average for the Journal Volume 524			19.8		9.6	50.1

$$pm = 32.6\%$$

With this result, it is clear that, on the average, only 32.6% of citations in the introduction sections of the articles studied are pertinent to the reported research. This result is supported by the predictions made by Adedayo.[10] In his study, Adedayo,[10] extended the work of Saha *et al.*[3], drawing similarities between citations and votes. When citations are considered as votes, Adedayo,[10] predicted that majority of citations made in the introduction sections may not be applicable in the computation of effective impact of publications.

CONCLUSION

This study has shown that significant proportion of citations made in the introduction sections of scientific articles only have imagined pertinence to the study reported. The result of the study also supports the assertions of Adedayo,[6]

Table 3: Citation distribution in articles published Volume 525

S/N	Journal Name	Journal Issue	Published Year	Article Page	N_c	Common citation	n_c	P(%)
1.	Nature	Vol. 525, No. 7567	2015	56	9	Refs.:8,9	2	22
2.	"	"	"	62	30	Refs.: 11,12,13,20,21,23,28,29,30	9	30
3.	"	"	"	68	19	Refs.:14,17,18,19	4	21
4.	"	Vol. 525, No. 7568	"	201	19	Refs.:3,5,6,7,8,9,10,11,12,13, 14,15,16,17,18,19	16	84
5.	"	"	"	206	14	Refs.:8,11	2	14
6.	"	"	"	212	21	Refs.:10,12,13,18,19,20,21	7	33
7.	"	Vol. 525, No. 7569	"	333	14	Refs.:8,9,10,11,12	5	36
8.	"	"	"	339	17	Refs.:6,12	2	12
9.	"	"	"	345	33		13	39
10.	"	Vol. 525, No. 7570	"	479	7	Nil	0	0
11.	"	"	"	486	20	Refs.:16,17,19	3	15
12.	"	"	"	491	21	Refs.:2,7,9,10,11,13,15,16,17 ,18,19,20,21	13	62
	Average for the Journal Volume 525				18.7		6.3	30.7

Table 4: Citation distribution in articles published Volume 526

S/N	Journal Name	Journal Issue	Published Year	Article Page	N_c	Common citation	n_c	P(%)
1.	Nature	Vol. 526, No. 7571	2015	62	25	Refs.:5,7,8,9,10,11,14,17,19, 20,21,24,25	13	52
2.	"	"	"	68	7	Refs.:1,2	2	29
3.	"	"	"	75	16	Refs.:3,6,8,10,16	5	31
4.	"	"	"	82	12	Refs.:5,8,11,12	4	33
5.	"	Vol. 526, No. 7572	"	207	4	Refs.:1	1	25
6.	"	"	"	212	17	Refs.:11,16	2	12
7.	"	"	"	218	32	Refs.:4,5,6,17,18,19,20,26, 29,30,31	11	34
8.	"	"	"	224	31	Refs.:5,10,16,26,27,29	6	19
9.	"	Vol. 526, No. 7573	"	380	16	Refs.:7,9,10,11,12,13	6	38
10.	"	"	"	385	10	Refs.:3,9,10	3	30
11.	"	"	"	391	34	Refs.:32,33	2	6
12.	"	"	"	397	23	Refs.:5,8,16,18,19,21,22,23	8	35
13.	"	Vol. 526, No. 7574	"	519	19	Refs.:9,10,11,13,17	5	26
14.	"	"	"	525	6	Refs.:1,3,5	3	50
15.	"	"	"	531	25	Refs.:12,13,16,20,23	5	20
16.	"	"	"	536	14	Refs.:4,8,10,13	4	29
17.	"	Vol. 526, No. 7575	"	653	21	Refs.:9,10,11,20	4	19
18.	"	"	"	660	19	Refs.:4,6,9,14	4	21
19.	"	"	"	666	9	Refs.:1,3,4,6,7,8,9	7	78
20.	"	"	"	672	22	Refs.:1,2,13,16,21	5	23
	Average for the Journal Volume 526				18.1		5	30.5

Table 5: Citation distribution in articles published Volume 527

S/N	Journal Name	Journal Issue	Published Year	Article Page	N_c	Common citation	n_c	P(%)
1.	Nature	Vol. 527, No. 7576	2015	49	17	Refs.:1,2,5,6,7,12,13,17	8	47
2.	"	"	"	54	38	Refs.:3,4,5,35,36	5	13
3.	"	"	"	59	20	Refs.:2,3,18,19,20	5	25
4.	"	"	"	64	40	Refs.:2,3,7,32,33,40	6	15
5.	"	Vol. 527, No. 7577	"	179	23	Refs.:9,12	2	9
6.	"	"	"	186	27	Refs.:6,7,8,15,16,17,18	7	26
7.	"	"	"	192	30	Refs.:22,23,28	3	10
8.	"	"	"	198	29	Refs.:24,25,26	3	10
	Average for the Journal Volume 526				28		4.9	19.4
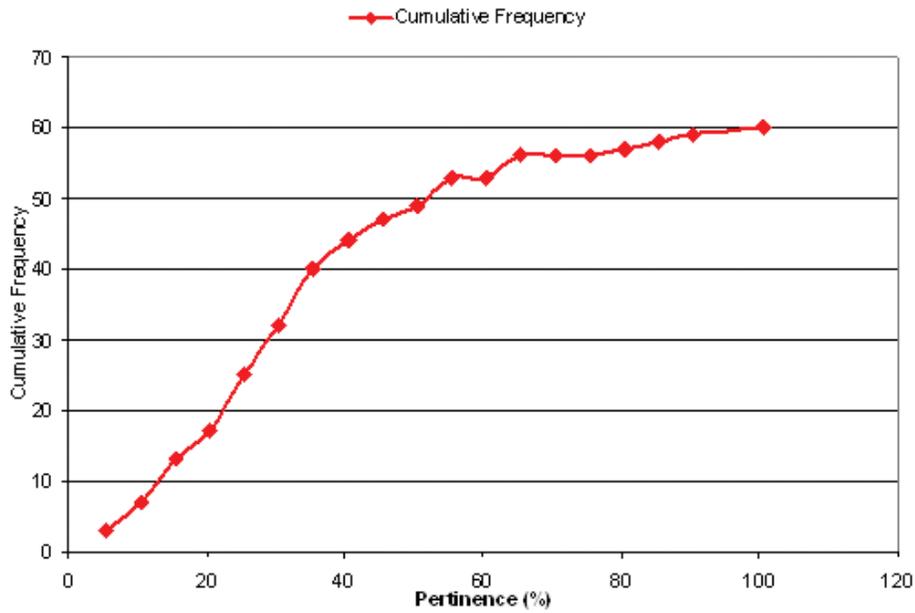
Figure 1: Cumulative Frequency Distribution of Pertinence for the Study
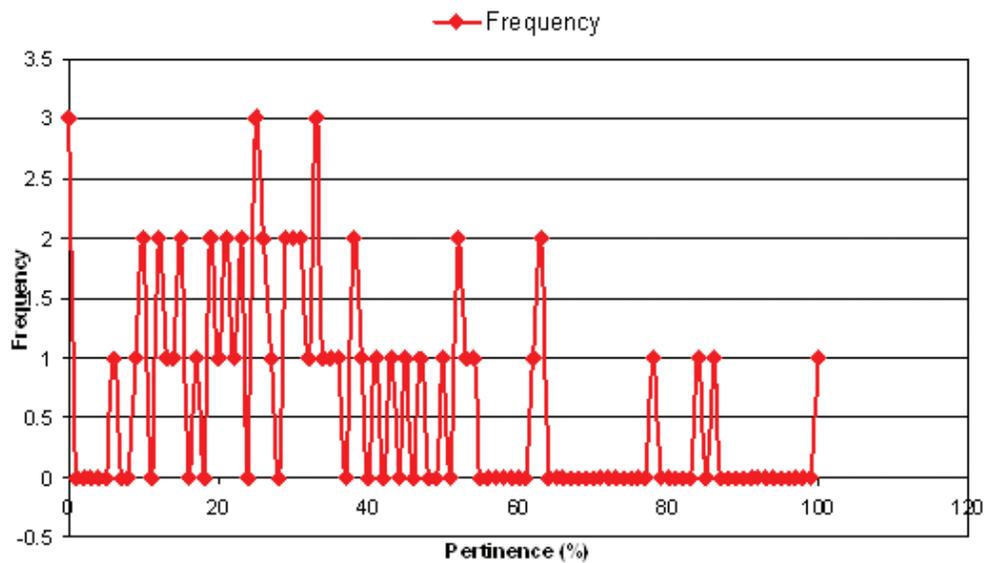
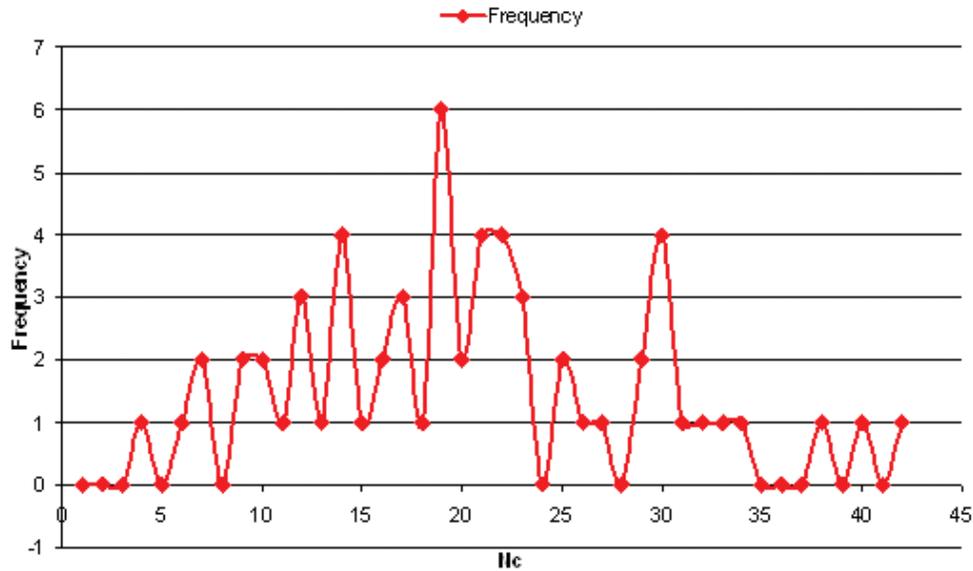**Figure 2:** Frequency Distribution of Pertinence for the Study

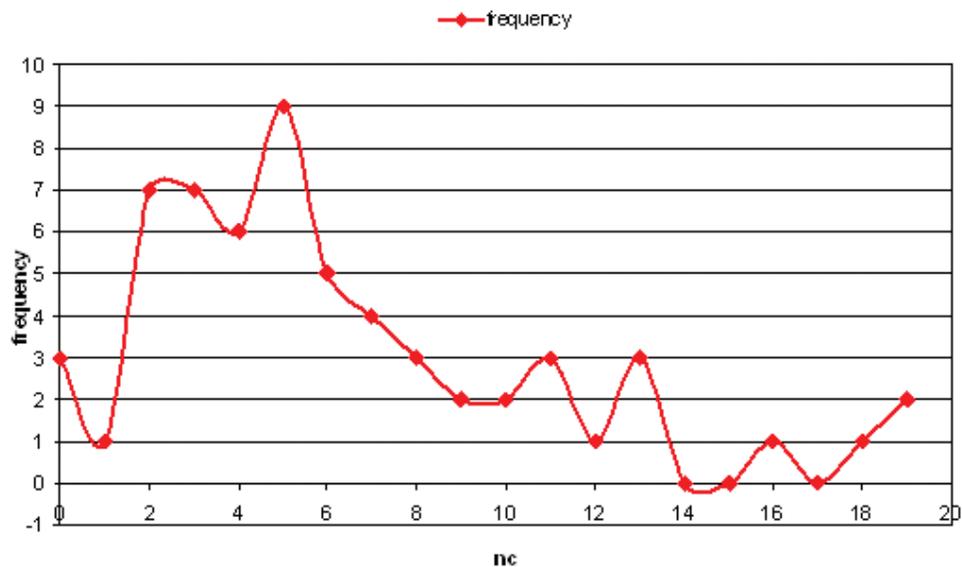**Figure 3:** Frequency Distribution of N_c for the Study

Figure 4: Frequency Distribution of n_c within the Articles Analyzed

and Persson & Glanzel[16] which discouraged honorific attribution of rewards and recognition. The opinion of Cawkell[13], that pertinence of cited literature reference in a scientific article is very important in impact evaluation considerations is also here by reinforced. The study, therefore, also suggests that citations in scientific articles can be validly classified into two i.e. Citations in Imaginary sections and citations in the Real sections. *Pertinence;* a new parameter useful in the evaluation of scientific publications has been introduced.

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