

Authorship and Years Before Retraction of Articles Published in Environmental Science Journals

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ABSTRACT:Retraction erodes the integrity in research. Author's composition of retracted articles in environmental science is rarely discussed. This paper presents retraction notices data extracted from the Scopus database. As previously discussed, the number of retractions is growing steadily. Most articles are retracted within five years of publication although, it takes more time for retraction of articles with multiple authors which is an indication that collaboration reduces the incidence of scholarly misconduct. Retraction reduces with increasing years after article publication. Finally, the analysis of variance yielded a p-value of 0.435 which showed that the pattern of retraction is the same, the author composition, notwithstanding.

KEYWORDS: Bar chart, environmental science, retraction, retraction notice, statistics, years.

I. INTRODUCTION

The world continues to rely on sound scientific knowledge for economic, social and technological advances. The knowledge generated from scientific research is sometimes flawed even after the knowledge has gone through the scientific scrutiny of peer review (1). The detection of the flaws embedded in scientific articles led to the process called retraction. Retraction of articles is mainly due to proven cases of error, misconduct or fraudulent practices, public relations issues (2). It is a form of academic dishonesty and scientific misconduct. Fabrication and falsification of data are the most recurring decimal in this aspect. Retraction notices are published as erratum by journals when a retraction case is investigated and proven. The notices are directed at the academic audience to inform them that the knowledge contained in the retracted article can longer be trusted and the journals are not liable to the devastating effect the article may cause or intended to cause. Hence the perceived scholarly impact and relevance of retracted articles deteriorate after retraction notice has been published (3). Although, a sizeable percentage of journals do not publish retraction notices (4). The major aim of retraction is to protect and preserve the integrity of science and research (5). Retraction appears to increase the incidence of the gross reduction of citations and impact of prior works published by the concerned authors since researchers tend to be more cautious in trusting the authors (6). Numerous researches have cited the pressure to publish as the main reasons why researchers engage in scholarly misconduct (7). This is spurred by proliferation of journal outlets and predictor publishing (8). The stain of reputation can extend to the authors' affiliations (9). Advances in technology that can detect plagiarism, fraudulent data and duplicate publications have helped to speed up the detection of alleged misconduct and subsequent retraction (10). This has led to a substantial increase in the number of retractions over the years (11). Regrettable, advances in technology have not helped in speeding up the retraction of articles due to falsification (12). The large incidence of retractions cannot be as a result of innocent mistakes (13), failure of acknowledgment of funding sources, duplicate publications (14), fake peer-review (15) and unprofessional editorial practices (16), conflict of interest among the authors (17), administrative errors (18) and violation of ethical codes (19).

The environmental science is not spared of scholarly misconduct and hence, retraction notices are published by journals in that domain. Scholarly misconduct is one of the factors that contribute negatively to impact factor,

relevance, and prestige of journals outlets, the subject classification, notwithstanding (20-21). Recent research has shown that retraction is oriented towards journals of low impact factors (22).

The reason for retraction (23), country or national affiliations of the authors (24), journal access type (25), years before publication (26), the impact factor (27) or CiteScore of the journal and the citation of the retracted articles (28) have featured prominently in literature and discussed extensively. Extant studies have detected large instances of self-citation of retracted articles by their authors (29). Scholarly misconduct is one of factors that contributes negatively to impact factor, relevance, and prestige of journal outlets. Often, the details of the scholarly misconduct that led to retraction are poorly stated and at times cloak in secrecy (30).

Table 1: Frequency and Percentages of authorship in environmental science retracted articles

Number	Frequency	Percentage
1	22	7.9
2	64	23.1
3	53	19.1
4	60	21.7
5	18	6.5
6 & above	60	21.7

Hence, there is an urgent need to standardize the process of retraction to ensure transparency and consistency (31). The COPE guidelines on retraction need to be flexible to deal with cases that are not explicitly specified in the code and to prevent external interference from funding agencies or institutions that funded retracted articles (32). Unfortunately, some journal editors did not seem to follow the stated rules in retracting articles.

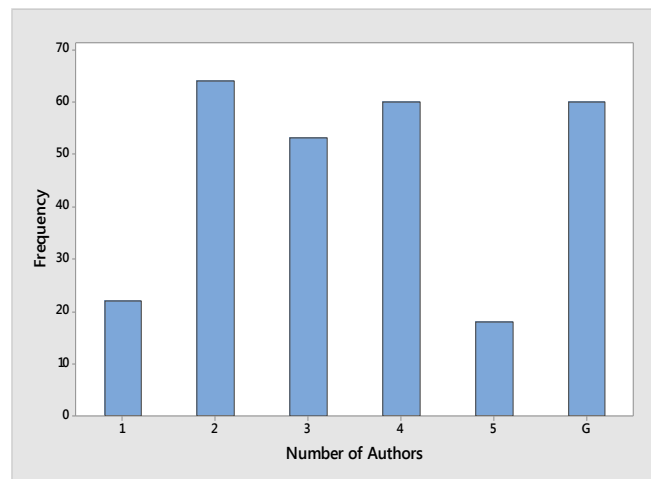


Figure 1: Author composition in environmental science retracted articles

***G represent 6 and above**

II. MATERIAL AND METHODS

The data was extracted from the Scopus database. The search was restricted to journals retracted in the environmental sciences. The raw data was transferred to Minitab 18.0 for the data analysis. Only three variables were extracted namely the number of authors (NOA), the year of publication (YOP) and the year of retraction

(YOR). Year before retraction (YBR) is YOR minus YOP. When YBR is zero, it implies that the article was retracted within a year of publication.

III. RESULTS AND DISCUSSION

Two hundred and seventy-seven articles were obtained. The first retraction notice of retraction in environmental science was in 1998. The frequency of author composition of the 277 retracted articles are presented in Table 1 and graphically in Figure 1.

It could be seen from Table 1 and Figure 1 in environmental science, 7.9% of retracted articles were of sole authorship, 23.1% from 2 authors, 19.1% from 3 authors, 21.7% from 4 authors, 6.5% from 5 authors and 21.7% from 6 authors and above.

Secondly, the frequency of years before article retraction is determined and presented in Table 2 and graphically in Figure 2. It can be seen that most retraction occurs within four (4) years of publication. The trend decreases steadily afterward.

Table 2: Frequency and Percentages of year before retraction in environmental science retracted articles

Number	Frequency	Percentage
0	52	18.8
1	78	28.2
2	41	14.8
3	22	7.9
4	32	11.6
5	23	8.3
6	10	3.6
7	8	2.9
8	2	0.7
9	2	0.7
10	3	1.1
11	1	0.4
12	2	0.7
13	1	0.4

Figure 2: Years before retraction of environmental science articles

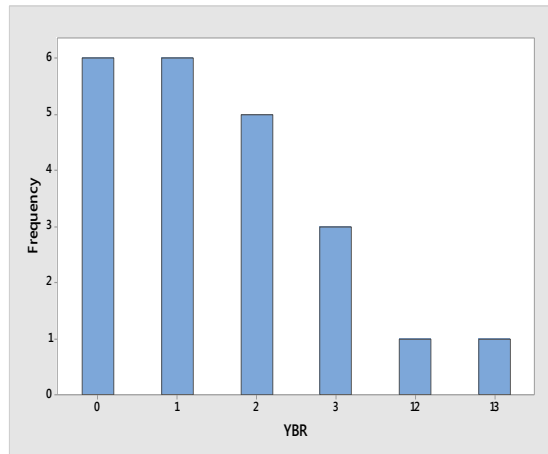


Figure 3: YBR for sole authorship article in environmental sciences

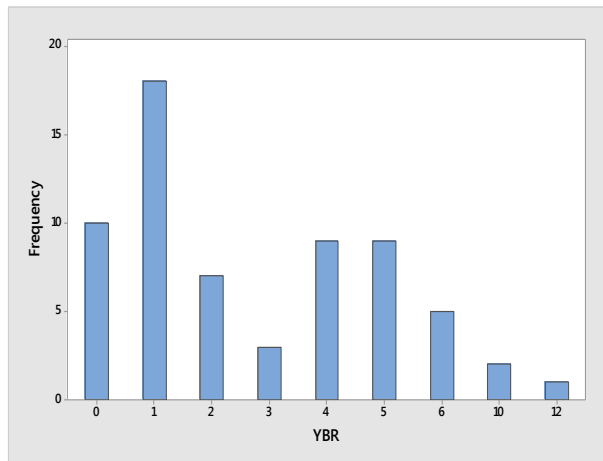


Figure 4: YBR for two authored articles in environmental sciences

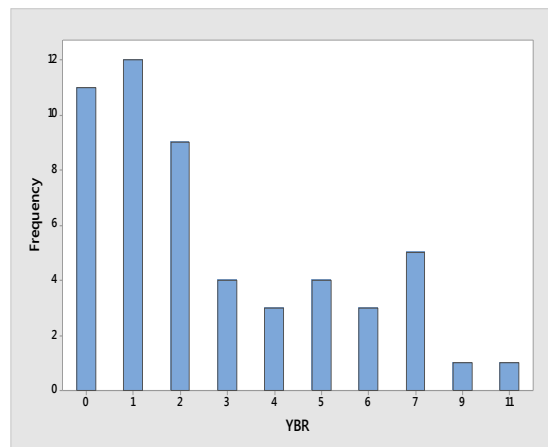


Figure 5: YBR for three authored articles in environmental sciences

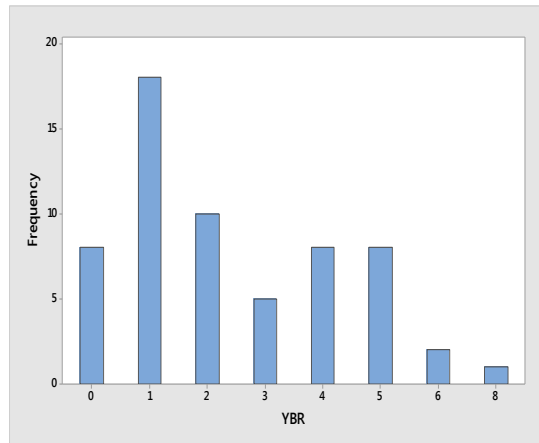


Figure 6: YBR for four authored articles in environmental sciences

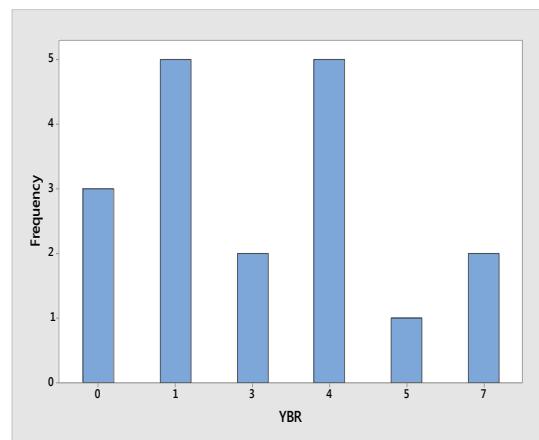


Figure 7: YBR for five authored articles in environmental sciences

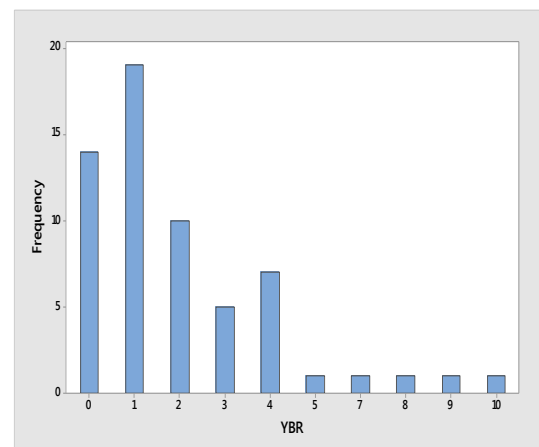


Figure 8: YBR for six or more authored articles in environmental sciences

Thirdly, the result was decomposed by authorship composition. Hence, the year before retraction for single authorship (Figure 3), two authorship (Figure 4), three authorship (Figure 5), four authorship (Figure 6), five authorship (Figure 7) and six or more authors (Figure 8).

From Figure 3, it could be seen that most papers authored by a single author were retracted within the first three years of publication.

From Figure 4, it could be seen that most papers authored by two authors were retracted mainly after one year of publication.

From Figure 5, it could be seen that most papers authored by three authors were retracted mainly within the first two years of publication.

From Figure 6, it could be seen that most papers authored by four authors were retracted mainly within the first two years of publication.

From Figure 7, it could be seen that most papers authored by five authors were retracted mainly within the first four years of publication.

From Figure 8, it could be seen that most papers authored by six or more authors were retracted mainly within the first four years of publication.

Lastly, analysis of variance (ANOVA) was done to determine the mean equality or otherwise of YBR for 1, 2, 3, 4, 5 and 6 and above authors. Anderson-Darling normality test presented in Table 3 showed that all the variables are approximately normally distributed and hence, ANOVA can be applied. Subsequently, the ANOVA test showed that the mean YBR is the same for all the authorship composition for articles retracted in environmental science (Table 4).

Table 3: Normality test

Variable	Anderson Darling
1	3.329*
2	2.541*
3	2.373*
4	2.225*
5	0.760**
6 and above	3.830*

*P value < 0.005, **P value < 0.05

Table 4: ANOVA showing that the equality of mean of YBR for all the categories of authors

Source	Adjusted SS	Df	Adjusted MS	F-value	P-value
Factor	29.85	5	5.970	0.97	0.435
Error	1663.32	271	6.138		
Total	1693.18	276			

IV. CONCLUSION

The paper has obtained different patterns of authorship composition of retracted articles of environmental science subject classification. The research revealed different times to take to publish retracted notices for articles. The research also revealed the increasing incidences of retraction in environmental sciences which corroborates findings of similar studies.

V. ACKNOWLEDGMENT

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VI. COMPETING INTERESTS

The authors declare that there is no conflict of interest that would prejudice the impartiality of this scientific work.

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