

Retractions among Indian Scientific Authors: Multiple Offenders

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Abstract

The study identifies repeated offenders of scientific misconduct among authors affiliated to Indian institutions. To do so, we searched the SCOPUS database for retraction notices of articles written or co-written by such authors. Among them, we identified those who authored or co-authored more than one retracted article. The number of such authors is worrying: About one in ten authors whose at least one article was retracted had more than one retracted publication. Among these multiple offenders, we detected two collaboration networks, linked to two institutions. The retraction notices for one group were mainly due to plagiarism while for the other mainly due to self-plagiarism.

Introduction

Retraction is used by journal publishers and editors to withdraw a publication from among the journal's publications, a process undertaken for a variety of reasons. Among them, plagiarism stands out as the most important one (Rubbo et al. 2019; Chauvin et al. 2019; Elango et al. 2019).

According to many authors, the increase in retractions in the scientific community reflects the severe disease that has been spreading all over the science world (e.g., Aspura et al. 2018; Lei and Zhang 2018; Moradi and Janavi 2018; Elango et al. 2019). Fanelli (2013), however, offers a different point of view: This increase is actually a good sign for science because it results from the improved skills of researchers and journal editors to identify fraudulent publications. Most likely, the truth is in-between—more and more authors choose to be unfair, and more and more of them are caught doing so. We should also normalize this increase by the number of publications: A great increase in retractions is accompanied by a great increase in publications. Considering these three aspects, retractions reflect the changing science world: more researchers, more pressure to publish, more publications, and more misconduct; but also more awareness and more skills in detecting fraud.

As we showed in our recent paper (Elango et al. 2019), Indian science has not escaped the misconduct problem. Among the 239 retractions we studied, most were by journals, two-third was issued in between 2011 and 2018, and almost half were due to plagiarism.

In this paper, we show a different look at the phenomenon: from the perspective of authors. To err is human, so should the scientific community discredit a colleague who has made a mistake? This issue and this question do depend on a particular situation and its various aspects, perhaps the most important being how serious the misconduct is. A serious one should not be forgotten; a light one—maybe? One face of scientific misconduct—a moral one—is cheating peers, the whole scientific community, and society. But another face is wasting public money invested in research (<http://sciencenordic.com/scientific-misconduct-bigger-problem-we-think>). So, even a minor misconduct seldom can boil down to a serious thing, like stealing a chocolate candy is still stealing or purposeful breaking down someone's bike is still breaking someone's property. Hence, no single instance of scientific misconduct should be swept under the rug ("He's young, he has to learn such things", "He's so important

that he can do whatever he wants,” and so on) but should be carefully investigated. We do not mean that everyone who has misbehaved that way must be punished—but that every case should be fairly investigated. What’s more, the more experienced a scientist, the more we should expect from him or her: What might be forgotten in the case of a researcher just starting career should often be considered a serious misbehavior in the case of an experienced scientist.

Indian science has been strongly developing in recent decades. It was ranked 8th in R&D funding among the forty countries based on 2014 R&D funding statistics (Resnik et al. 2015). However, India lacks a national policy for research misconduct, like the US’s Office of the Research Integrity (Juyal et al. 2015). But there is an independent Indian body of scientists—the Society of Scientific Values—whose primary goal is upholding ethics among the Indian scientific community (Jayaraman 2011).

Hesselmann et al. (2017) estimated that ten authors were responsible for 20% of retractions in the RetractionWatch database. This suggests that some authors choose misconduct as a path to their career in science: It did not just happen, it was not just a mistake, and it was not just a misunderstanding—it was a calculated decision. We are not aware of any research on repetitive misconduct in science, however. Hence, this paper is the first attempt to study this topic, and we do it in an Indian context.

A follow-up of Elango et al. (2019), this research thus sheds light on scientific misconduct in Indian science in terms of those who do it. In particular, we will analyze whether there are multiple offenders of scientific misconduct among Indian authors; and if so, we will analyze their publication behavior in terms of retracted publications. In so doing, we will use the same data set of Indian retractions we analyzed in our previous publication (Elango et al. 2019). Restricting our analysis to this very data set will make the two sister studies one large analysis. To analyze repeated offenders, we have chosen the following relevant parameters: broad categories of reasons for retraction, repeated offenders, recidivist groups, institutions hiring repeated offenders.

Methods

Data

The data were drawn from the SCOPUS database. On 3 August 2018, we downloaded the data for the keyword (“retract*”) search in titles and limiting country affiliation to “India”. A total of 239 retraction notices issued between 2005 and 3 August 2018 for Indian authored or coauthored publications were considered for this study. We described all the details of data collection in our previous article (Elango et al. 2019).

Analysis

In our earlier paper (Elango et al. 2019), we categorized the reasons for the retractions into 10 groups. In this study, however, we do not need so many of them: We prefer more general groups. So, we will use the

following four broad categories (Bar-Ilan & Halevi 2018):

- i. Ethical Misconduct: plagiarism (including self-plagiarism), authorship dispute, duplicate publication, copyright issues, inappropriate citations, and fake review process.
- ii. Scientific Distortion: fake data, errors/mistakes, experiments not conducted, etc.
- iii. Others: reasons that do not fit any of the two categories above, such as contrary statement, similar research work already published.
- iv. Unknown: no reason provided.

Offenders' network

We used VOSviewer to analyze whether there is any collaboration among those Indian authors whose articles were retracted. To construct the network map, we took the following steps:

1. Upload the dataset in a CSV format.
2. Select the type of analysis: co-authorship and full counting method.
3. Set the threshold value of minimum five documents by an author.
4. Screen authors and institutions: nine authors meet the criteria.
5. Visualize the network (Figure 1).

Results

Most retraction notices we analyzed were due to ethical misconduct (58.2%) (Table 1). Only 18% of the retractions were due to scientific distortion, such as the manipulation of data and images while 5% were due to other reasons, such as administrative errors, experiments not conducted, and similar work already published. For the remaining nearly one-fifth of the retractions, we could not detect the reason.

Table 1 - Broad Category of Reasons for Retraction

Broad category of reasons	No. of retractions	Share among 239 retractions
Ethical misconduct	139	58.2
Scientific distortion	43	18.0
Others	12	5.0
Unknown	45	18.8
Total	239	100

A total of 878 Indian authorships were responsible for the 239 retracted publications with 742 unique authors. Among the 878 authorships, there were 742 unique authors who affiliated to 296 different

institutions both in India and abroad. In total, authors from 50 foreign institutions were involved in 38 (15.9%) retracted publications.

Table 2 provides the information about the number of retractions per author. Nearly 10% of the authors having more than one retracted publication account to a quarter of the authorships. Moreover, almost 10% of the authors had two or more retracted publications.

Table 2 - The number of retractions per author.

No. of retractions	No. of authors	Total authorship	Share among authors	Share among authorships
11	1	11	0.1	1.3
9	1	9	0.1	1.0
8	1	8	0.1	0.9
6	1	6	0.1	0.7
5	4	20	0.5	2.3
4	1	4	0.1	0.5
3	17	51	2.3	5.8
2	53	106	7.1	12.1
1	663	663	89.4	75.5
Total	742	878	100%	100%

Table 3 shows top Indian offenders, that is, those whose at least four papers were retracted. They were affiliated to three institutions: S.V. University (five authors), the Bhabha Atomic Research Centre (three authors), and Kalasalingam University (one author). Among these offenders, those from the Bhabha Atomic Research Centre and D. Rekha of S.V. University still work there. S. Gurunathan, however, changed his occupation.

Table 3 - Indian authors whose at least four papers were retracted.

Authors	Affiliation	Scopus Author ID	Latest publication in SCOPUS	No. of documents	No. (share) of retracted documents	Retraction year (no. of retractions)	Main reason for retraction
Chiranjeevi, P.	S.V. University	8836635700	2008	56	11 (19.6)	2008 (11)	Plagiarism (11)
Suvaradhan, K.	S.V. University	8836635800	2008	43	9 (20.9)	2008 (9)	Plagiarism (9)
Rekha, D.	S.V. University	8298635500	2019	33	8 (24.4)	2008 (8)	Plagiarism (8)
Kumar, K.S.	S.V. University	14008823600	2008	29	6 (20.7)	2008 (6)	Plagiarism (6)
Sahoo, N.K.	Bhabha Atomic Research Centre	56388376900	2019	142	5 (3.5)	2017 (3), 2018 (2)	Self-plagiarism (5)
Thakur, S.	Bhabha Atomic Research Centre	9332511100	2019	62	5 (8.1)	2017 (3), 2018 (2)	Self-plagiarism (5)
Tokas, R.B.	Bhabha Atomic Research Centre	8218050100	2019	75	5 (6.7)	2017 (3), 2018 (2)	Self-plagiarism (5)
Jayaraj, B.	S.V. University	8407902900	2008	24	5 (20.8)	2008 (5)	Plagiarism (5)
Gurunathan, S.	Kalasalingam University	23993799500	2019	129	4 (3.1)	2010 (1), 2011 (1), 2012 (2)	Fake data (3)

* excluding retraction notices

Note: Gurunathan, S. is now with Konkuk University, Seoul, South Korea

We detected two collaboration networks among the repeated offenders (Figure 1). The grouping reflects the affiliations of the offenders: One group (represented by red circles in Figure 1) collects the five top offenders from the S.V. University (Table 3) while another group the three top offenders from the Bhabha Atomic Research Centre. S. Gurunathan as the only one of those listed in Table 3 did not cooperate with the others listed there. The picture Figure 1 depicts suggests that authors caught on unethical behavior tend to cooperate with colleagues from the same institution; a closer look at their affiliations proves that they tend to choose colleagues from the same department or division. For example, both authors from the Bhabha Atomic Research Centre belong to the Atomic & Molecular Division, and the authors from the S.V. University belong to the Department of Chemistry, except for B. Jayaraj, who works in the Department of Mathematics.

There are different types of academic institutions in India. For example, the primary objective of colleges is to teach in their respective streams, such as science, engineering, and pharmacy. Universities have two main aims: to conduct research in the frontier areas of arts, science, humanities, and technology; and to

teach advanced knowledge in these fields. Institutes of national importance offer world class education in the fields of science, engineering, and technology. Not regulated by any higher education regulating body, such as UGC, AICTE, or MCI, institutes of national importance are fully autonomous and come under the Ministry of Human Resource Development, the Government of India.

We classified the Indian academic institutions involved in the retracted publications according to their type (Table 4). The most frequent type was college: In 77 out of 239 (32%) retractions, at least one author was affiliated to a college. However, since in India there are almost forty thousand colleges, those 77 constitute only 0.2% of them. In this context, universities and institutes of national importance were more frequent (Table 4).

Table 4 - Repeated misconduct in authors affiliated to various types of Indian institutions.

Type	No. of institutions involved in 239 retractions	Total no. of such institutions in India [#]	Share among institutions involved in the retractions
Academic	188		
College	77	39071	0.2
Private University	3	305	1.0
State University	53	385	13.7
Central University	10	46	21.7
Deemed University—Private	17	80	21.2
Deemed University—Govt. Aided	1	10	10.0
Institute of National Importance	27	127	21.2
Others	58		
CSIR Laboratories	12	38	31.5
ICAR Institutes	9	102	8.8
Research Institutes	4		
Corporates like Microsoft	6		

[#] The data come from the AISHE (2018-19), All India Survey on Higher Education, established by the Indian government to conduct annual surveys on higher education (<http://aishe.nic.in/aishe/viewDocument.action?documentId=263>).

Table 5 lists the institutes for which we detected at least four retracted publications. Three are state universities, two are institutes of national importance, and two are central universities. Among these institutions, the Bhabha Atomic Research Centre, the University of Delhi, and Banaras Hindu University are among the top Indian institutions in terms of highly cited papers (Elango and Ho 2017). The Indian Institute of Technology Delhi is among the leading institutions of Indian highly cited papers in the field of computer science (Gupta and Dhawan 2017) and materials science (Gupta, Dhawan & Gupta 2015).

Table 5 - Top Indian institutions involved in the retractions studied.

Affiliation	Country	Type of affiliation	No. of retractions	Share in 239 retractions
S.V. University	India	State University	12	5.0
Indian Institute of Technology Delhi	India	Institute of National Importance	7	2.9
Bhabha Atomic Research Centre	India	Research Organization	6	2.5
University of Delhi	India	Central University	6	2.5
Indian Institute of Technology Dhanbad	India	Institute of National Importance	5	2.1
Kalasalingam University	India	Deemed University—Private	4	1.7
Annamalai University	India	State University	4	1.7
Banaras Hindu University	India	Central University	4	1.7
Bharathidasan University	India	State University	4	1.7

Discussion And Conclusion

In terms of intentions, scientific misconduct has two main faces. Most of the times, it is either planned “in cold blood” or committed because of a lack of knowledge or awareness. Sometimes, it can be something in between, like the first attempt to abuse the weaknesses of the publication system, or determination to use an unsuccessful experiment (accompanied by thoughts like “So much work for nothing? I won’t let it go that easy!”).

When misconduct is committed because of a lack of awareness, the community can help. This situation is quite often, actually. Mason (2009) stresses poor awareness among scientists, especially non-native English ones, on how to correctly use other people’s work. Since scientific research is the appreciation and continuation of the current state of knowledge, he claims, avoiding plagiarism is not an easy job. Horback and Halffman (2019) provided guidance for journal editors and publishers on how to improve the ability of their review processes to detect forms of problematic research, particularly image manipulation (so-called “imagipulation”, Kozak 2009) or issues related to authorship. The problem, however, lies not in the lack of knowledge in the community, but in the lack of knowledge among its particular members, young researchers in particular.

The repeated offenders we have detected in our analysis unlikely match the above scenario. Most likely they commit their misconduct on purpose. Also quite likely, the many retractions of their publications are just the tip of an iceberg. For examples, SCOPUS indexes 67 documents (co)authored by Mr. P. Chiranjeevi, of which eleven are the retraction notices issued in 2008 due to plagiarism (including self-plagiarism) (Table 3). What is the chance that these eleven texts were his only plagiarized texts? We must remember that retractions are in general indeed only the tip of this unethical iceberg. No one has ever tried to estimate the proportion of retractions of unethical publications that deserved retractions, for the simple reason that this would be work beyond our current technological means. But offenders, beware: Technology develops so quickly that in 20 years we will be able to catch a much higher share of plagiarized texts than we can now.

The only means we can use to alleviate the consequences of misconduct committed on purpose, with cold blood and no actual conscience, is to catch, retract, and punish. Among the three, catching is most difficult, but with the development of devoted software, this is getting simpler and more efficient. Retraction should follow every single time when the misconduct is serious—but the community should develop clear recommendations on which offences should be retracted, which do not have to, and which should not be retracted whatsoever. For the moment, journals and publishers seem to be following their own judgment, and since they can differ in these terms, one publisher will retract a publication that would not be retracted in another one.

A retraction notice should contain valid and logical reasons for retracting the article. From our study it follows that this is not always the case: Almost 20% of the retraction notices did not mention the reason.

Further, as mentioned above, retraction should not be used anytime something is wrong, especially when the mistake was unintentional and minor, of too small importance to justify retraction. In such instances, whenever possible, a corrigendum or erratum may be issued for such publications. For example, in 2011, Medicinal Research Reviews retracted article “Tetraoxanes: Synthetic and medicinal chemistry perspective” due to an inappropriate citation of a previously published work. The authors agreed to this retraction. While we do not have sufficient knowledge to decide whether or not this mistake was serious enough to justify retraction, a reason like this suggests an erratum might suffice.

A related issue is journalistic ethics. We know that some journals are *so* predatory that they would unlikely retract *anything* they have published. We suppose that some of them actually assume that most of what they publish results from this or that type of unethical behavior, so they do not care: What really counts is the money. So, perhaps the community requires an independent international body that would take care of retractions. Such retractions would actually be something different from actual retractions done by the journals themselves. For the moment, the idea seems out of reach, at least for the simple reason that such a body would have a tremendous job to do. It could actually deal with retraction suggestions from the community. Say, someone detects an unethical publication and decides to let the journal know about the problem. The journal does not react. So, the person can submit the case to the body. Another crucial question is: How should such a body cooperate with scientific journals, especially

those that simply do not care or even do not wish to be subject to the interests of such a body? That the idea seems unrealistic does not mean it is so, however—it just requires serious thought.

RetractionWatch is a body that currently plays a significant role in the retraction issue in the scientific environment. It informs the society about various issues related to retractions, so it serves part of the function we discussed above. As of August 2019, the blog contains 20,820 items on publications with various issues related to scientific fraud (https://en.wikipedia.org/wiki/Retraction_Watch#cite_note-why-7).

How to punish unethical offenders is yet another topic, which we do not cover in this paper. The only thing that must be stressed is that every single instance of unethical behavior should be carefully analyzed from various points of view. Purposeful misconduct should always be punished, although each case should be considered independently and the punishment should be proportional to the guilt's seriousness. The first purposeful misconduct, especially when committed by a young researcher, should not be treated the same as repeated misconduct.

That the research community is not free of misconduct we have known for quite some time. Everyone has heard of quasi-scientists who became famous based on falsified data, like Andrew Wakefield, Shinichi Fujimura, or Hwang Woo-suk; some developed their whole careers based on repeated misconduct, sometimes from the its very beginning to the very end, like Diederik Stapel. As we have shown, there are many more such Andrews and Diederiks, though maybe not that famous—at least not yet. And we are talking only about those who were caught... It is high time for the scientific community to do something with the increasing problem with misconduct. We hope that our research will initiate similar analyses, because we have studied only an Indian drop in the global ocean.

Declarations

Competing interests: The authors declare no competing interests.

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Figures



Figure 1

A network of multiple misconduct offenders among Indian authors.