Retractions from altmetric and bibliometric perspectives

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Traditional gatekeepers

Pre-publication peer review
The retraction

• “A mechanism for correcting the literature and alerting readers to publications that contain such seriously flawed or erroneous data that their findings and conclusions cannot be relied upon.” (Wager, Barbour, Yentis, & Kleinert, 2009).

• Papers are retracted at an increasing rate (Review in Hesselmann et al., 2017)

• Increased awareness of misconduct (Fanelli, 2013)

• Many potential retractions (Bik, Casadevall, & Fang, 2016)
Retractions as a function of total publications

Source: Steen, Casadevall and Fang (2013)
Characteristics of retractions

- Mostly retracted due to misconduct (e.g. plagiarism) or error
- No agreed definition of error and misconduct
- Most are in the biomedical sciences (Ribeiro & Vasconcelos, 2018)
- JIF correlates with certain reasons for retraction (fraud, suspected fraud or error) (Fang, Steen & Casadevall, 2012)
- Fraud takes considerably longer time to retract than error and plagiarism (Fang et al., 2012)
Retractions in the social media

- Retraction Watch – „Tracking retractions as a window into the scientific process”

- “public papers were retracted 6.5-fold more, and corrected 7.7-fold more, than those in the private set.” (Brookes, 2014)
Current work

• Could there be an association between the bibliometric and altmetric characteristics of retractions?

• Explores the differences between retractions with high altmetric attention scores and random altmetric attention scores
Methods

- 1700 Pubmed retractions between 2012 and August 2017
- 919 matched with altmetric attention scores from June 2016
- Altmetric attention scores retaken in beginning of September 2018
- Citation data taken from Web of Science at August 2018 for the years 2012-2017
- Sample: top 100 retractions and 100 random retractions
- Coding for the cause of retraction
Altmetric attention scores and citation counts

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<td><strong>Altmetric attention scores</strong>, top and random sample (Table 1)</td>
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Journal Impact Factor and time between publication and retraction

Journal Impact Factor, top and random samples (table 3)

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Time between publication and retraction, top and random samples (Table 4)

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Why are papers being retracted?

**Misconduct**
- Data fabrication/falsification
- Plagiarism/duplication
- Compromised peer review
- Unethical conduct
- Conflict of interests
- Other

**Error**
- Influenced by a third party
- Other
- Unclear
Causes of retraction

\[ \chi^2 = 19.99, \text{ df} = 4, p < .001 \]
Binary choice model

- Dependent binary variable: Misconduct (1) and error (0)
- Three independent variables:
  - Time to retraction
  - Altmetric attention scores
  - WoS citation counts
- Focus: direction of the effect and statistical significance of the regressors

- **Random** sample: no regressor was significant at the p < 0.05
- **Top sample**: Time to retraction (positive), altmetric attention scores (positive) and citation counts (negative) all affect the likelihood to be retracted for misconduct
Causes of retraction within the misconduct category
Causes of retraction within the misconduct category

- Data falsification/fabrication was the most prominent cause of retraction in the top sample (62%)
- Plagiarism was the most prominent cause of retraction in the random sample (41%)
Time to retraction

- General misconduct (both samples): 614.43 days
- Plagiarism: 586.95 days
- Data falsification/fabrication: 666.74 days
- Chi-squared test shows statistically significant differences ($\chi^2 = 22.80$, df = 6, p < .001)
Limitations

• The sample is relatively small.

• New altmetric events might keep on happening.

• New citations for retracted publications might accumulate over the years.

• Other papers from the years we studied might be retracted in the future.

• Sample includes republished papers.

• We cannot tell causation.
In conclusion

- Retractions prominent in social media are usually also more prominent from a bibliometric point of view, in comparison with the random sample.

- The samples as a whole do not differ in the average time it takes an article to reach retraction.

- However, different types of misconduct show different time to retraction, and the top sample contains more data fabrication/falsification, while the random sample contains more plagiarism/duplication.

- This is a possible explanation to the results of the binary choice model that show days to retraction, altmetric attention score and citations are all significantly associated with being retracted for misconduct in the top sample, but not in the random sample.

- More research is needed!
Thank you for your attention!
References


References


Binomial choice model, top and random sample

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<td>Days being published</td>
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Note: *p<0.1; **p<0.05; ***p<0.01