The Effect of Press Releases on Promoted Articles' Citations and Altmetrics

Introduction

Despite quantitative metrics' prominent role as subjects in scientometric research, comparatively little is known about the degree to which individual articles' later citations and altmetrics are affected by the articles' visibility in traditional media in the time around their publication. One common way for research institutions and scholarly publishers to promote their most interesting new publications to the media are press releases. The perhaps most prominent multilingual portal for the distribution of press releases on scientific research is *EurekAlert!*. Set up by the American Association for the Advancement of Science in 1996, EurekAlert! allows universities, corporations, publishers, government agencies, and other eligible organizations engaged in scientific research to disseminate press releases to journalists and the public against payment of a submission fee.[1] According to Vrieze (2018), with more than 14,000 registered reporters from more than 90 countries EurekAlert! has become for science press and news releases "what Google is for searching and Amazon for online shopping". The fact that EurekAlert! as a platform covers an impressively wide variety of disciplines, publishers, journals, authors, and keywords also makes it a highly interesting source for altmetric analyses (Bowman & Hassan, 2019).

In this research-in-progress we set out to achieve a better understanding of how journal articles benefit from the additional exposure associated with being mentioned in press releases on EurekAlert! with regard to their later metrics, i.e. citations and various altmetrics. We also aim to learn more about which kind of research is represented predominantly on EurekAlert! by investigating the journals and publishers featured most frequently on the platform.

Methods

We extract DOIs from press releases published on EurekAlert! in 2016 to identify scientific journal articles that have been promoted in them. We then query the Crossref API to retrieve metadata for the respective publications and analyze their distribution across publishers and journals. In addition to this set of articles which received the treatment of being promoted in press releases, we construct a second publication set as a control group, consisting of one random article from the same journal and publication month for every article from the treatment group, again using the Crossref API. Citation counts for all articles are retrieved from the CCB databases[2], altmetric counts from Altmetric.com. Differences between both article groups regarding these metrics are analyzed by comparing their distributions, means, medians (to account for the skewness expected in metrics data), and by applying Mann-Whitney-U tests to test for statistical significance.

Selected Results & Discussion

Querying our dataset of EurekAlert! press releases for DOIs, initially 11,110 identifiers were retrieved. Removing those cases not recognized in the Crossref database, those not belonging to journal articles, and those for which no control group counterpart could be found left us with 10,483 valid DOIs of journal articles mentioned in press releases on EurekAlert! in 2016 for analysis.

A look at the top 10 journals represented in this dataset suggests a prevalence of medicine-related publications – five of these journals have a clear focus on medicine, while the remaining five journals are multidisciplinary. This is in line with the findings of a recent study on disciplinary distributions in embargo e-mails sent by scholarly publishers to science journalists (Lemke, Brede, Rotgeri, & Peters, under review).

Comparing the means and medians of our treatment and our control group regarding citations and five prominent altmetrics reveals substantial advantages for promoted articles across all metrics (as seen in Table 1). Regarding Mendeley readers, tweet mentions, Facebook mentions, and citations

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the mean of the treatment group is about 2 to 4 times as high as the mean of the control group, for mentions in blogs and mainstream media the advantages are even more extreme (seven and ten times higher mean, respectively). All mean differences are statistically significant with $p < .001$. The medians also reflect the previously observed advantages. The fact that all medians are way below the respective means indicates that the distributions at hand are in fact heavily right-skewed.

Table 1: Means and medians of citations and altmetric indicators across both article groups

Indicator	Mean		Median	
	Treatment	**Control**	**Treatment**	**Control**
Citations (Web of Science)	43.87	22.82	21	11
Tweet mentions	47.07	17.96	13	3
Facebook mentions	3.14	0.93	1	0
Mainstream media mentions	18.28	1.83	10	0
Blog mentions	2.42	0.36	1	0
Mendeley readers	125.58	70.87	71	41

Conclusions and Future Work

Our findings indicate considerable metrics-wise advantages for journal articles that were mentioned in press releases on EurekAlert! as well as a dominance of medicine-related and multidisciplinary journals among the most frequently featured publications. These observations have implications for the use of metrics in assessment exercises – they in particular provide another argument as to why metrics-based comparisons of entities (i.e. institutions or individual researchers) are problematic, especially across disciplines, as an article's expectable metrics might to a significant extent be determined by whether research institutions and publishers deem its topic marketable in external science communication like press releases.

The results reported in this abstract however are preliminary and more work is needed to more precisely evaluate their practical implications. We will continue to further refine our dataset as well as complement the fairly basic approach shown here with more sophisticated methods, to provide more nuanced answers to the questions tackled in this study and to increase its findings' validity. For instance, for the future we plan to repeat our analysis with samples restricted to articles published in special issues to better control for topical differences between treatment and control group. Furthermore, it remains to be seen to which degree the observed differences in metrics can indeed be attributed to the articles' promotion in press releases, or whether they are the result of broader promotional campaigns conducted by publishers or research institutions. We aim to approach this question in the future by combining our dataset with data on articles' mentions in other forms of external science communication, e.g. embargo e-mails, news articles, and social media posts, and by complementing the quantitative analyses with qualitative investigations of the promotion activities undertaken for selected prototypical journal articles.

Acknowledgments

References

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