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Exploring the relation between press releases and media coverage of Japanese university research outputs

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Abstract

In recent years, the number of press releases from universities has generally increased over time. How academic research is reported in the media is a big concern for management at universities and for research on the diffusion of scientific knowledge. In this study, we investigate the current situation and analyze the relation between press releases and their coverage in two major national newspapers in terms of the source article's altmetric attention score, citation, subject field, and collaboration network from 2011 to 2014.

Introduction

To chieve accountability and as one of the strategies to secure research funds and to increase university enrolment, the number of universities making an effort to publish press releases to announce research findings has grown rapidly in recent years, and the number of press releases related to top-tier universities in Japan has generally increased over time (Nishizawa and Sun, 2012). How academic research is reported in the media is a big concern for management of universities and for research on the diffusion of scientific knowledge. In our previous studies, we investigated the relation between university press releases and two major Japanese national newspapers from 2007 to 2012 (Nishizawa and Sun, 2014), and the relation between the Altmetric Attention Score (AAS) (Altmetric, 2018) of the source article in press releases and coverage in newspapers in 2012. It has been shown that research published in journals with high Eigenfactor values tend to be announced in university press releases (Nishizawa and Sun, 2016), and the AAS of publications tends to have a positive correlation with instances of being featured in newspapers (Nishizawa and Sun, 2017).

In this study, after updating the current situation of university press releases from 2005 to 2015, we identified each source article in press releases from 2011 to 2014 through their Digital Object Identifier (DOI), and investigated the relation between press releases and their coverage in two national newspapers, Mainichi Shimbun and Yomiuri Newspaper, in terms of their AAS score, citation counts, subject fields, and collaboration network.

Data and Methods

Press releases

Table 1 shows the number of press releases in the Nikkei press release (Nikkei press release, 2018) database from 2005 to 2015 that contain the query word "大学 (university)." As reported in Nishizawa and Sun (2014, 2015), the number of press releases concerning universities has increased suddenly in recent years.

Table 1: Number of the press releases found using the query word "university"

Year	*total*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*
Press release (UNIV)	14582	1154	1097	1216	1209	1244	1299	1429	1472	1417	1375	1670

Newspaper

We drew data from the corpora of two major national newspapers (Yomiuri Shimbun and The Mainichi) in Japan (Nichigai Associates, Inc., 2018). The organization's name was extracted from the article's text body using the name identification database described previously (Nishizawa and Sun, 2016).

Correspondence between the press releases and newspapers

Our method and extraction results for articles mentioned in both newspapers and press releases were described in Nishizawa and Sun (2014). The number of articles that corresponded to the press releases from 2011 to 2014 and the newspaper article are shown in Table 2.

Altmetric Attention Score and Cited numbers in Web of Science

In this research, the DOIs of journal articles announced in press releases were picked out from the body of the press release text. When DOI information was not found in the press release text, the journal article's DOI was identified based on the article title, author information, and journal information. We found the Altmetric application-programming interface key from Altmetric.com and obtained altmetric data in JavaScript Object Notation format through an https protocol. Altmetric.com offers many altmetric indexes, and the AAS is used in this study. Similarly, the number of citations for articles was extracted from the Web of Science (WoS) (Clarivate Analytics) using DOIs.

Table 2 shows the number of DOIs identified in the press releases, the number in which AAS was obtained and the number in which the cited number was obtained, together with the number of correspondences with the newspaper article.

Table 2: Number of identified DOIs, corresponding newspaper articles, AASs, and cited numbers

Year	*DOIs in PR*	*Corr Mainichi*	*Corr Yomiuri*	*Corr Both*	*AAS hit*	*WOS hit*
2011	381	35	43	19	249	367
2012	464	57	79	34	389	452
2013	528	64	68	30	442	506
2014	465	32	33	12	388	436

Results and Discussion

Impact of corresponding newspaper articles

Figure 1 shows the frequency distribution of Log_{10} (AAS) (1a): the specific DOI, (1b): the corresponding newspaper article, (1c): without corresponding newspaper article is also shown. Similarly, Figure 2 shows the frequency distribution of Log_{10} (cited number) (2a): the specific DOI, (2b): the corresponding newspaper article, (2c): without corresponding newspaper article is also shown. Although it is a preliminary result, both (b) corresponding newspaper articles show high AAS and cited numbers, respectively. Table3 shows the result of the t-test against with/without corresponding newspaper articles for AAS ((1b: with News), (1c: without News)), and cited numbers ((2b: with News), (2c: without News)) for combined data from 2011 to 2014, respectively. As shown by the P value of the table (t-test: 95% confidence interval, two sided), the difference in the mean value is significant, and the mean value is higher when there are newspaper articles, especially in AAS.

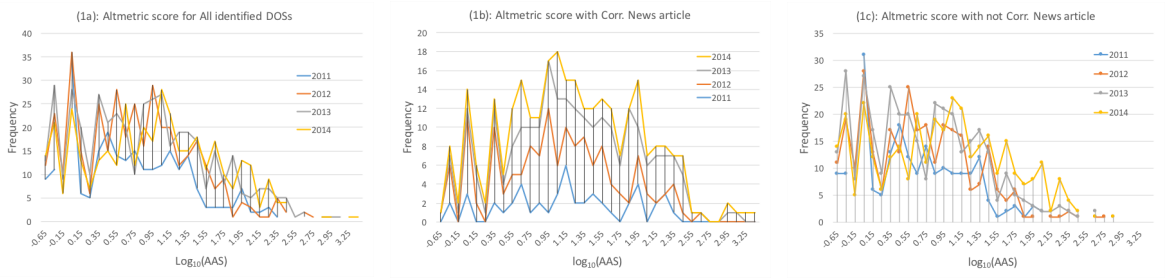

Figure 1. Distribution of log_{10} (Altmetric Attention Score)

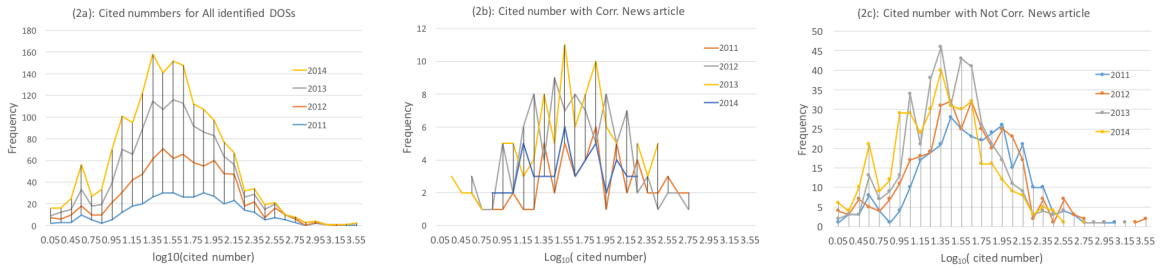

Figure 2. Distribution of log_{10} (Cited number)

Table 3: Result of t-test against with/without corresponding newspaper articles

	t-test: *log10(AAS)*		t-test: *log10(Cited number)*	
	(1b): with News	(1c): without News	(2b): with News	(2c): without News
mean	1.2047	0.7284	1.6275	1.4859
std. dev.	0.7513	0.6977	0.5387	0.4994
n	292	1183	309	1447
degree of freedom	1473		1754	
t	10.2856		4.4608	
P(T<=t) One sided	2.60E-24		4.34E-06	

Co-authorship status of the source article of Press Release

In the previous report, we have reported about the mean value and standard deviation of AAS for the co-authorship status of the article in the press release (Nishizawa and Sun, 2017). In that report, we examined the relation between the co-authorship status and the value of AAS only with data from 2012, but in this report, we extended the data from 2011 to 2014 and also examined the relation between AAS and cited numbers in the WoS.

The co-authorship status of the article announced in the press release is classified as shown in Table 4, and the mean values of AAS and the cited number for each category and their standard deviations were obtained. In the previous report, we used the correspondence author and the country of the author's institution to classify the categories, but this time we used the RA (Reprint author) term of WoS instead of the correspondence author. As RA is one person, it is not classified as a category corresponding to Japan-foreign entity corresponding to the last code 2. The co-authorship status of the article announced in the press release is classified as shown in Table 4, and the mean values of AAS and the cited number in WoS for each category, as well as the standard deviations were obtained.

Table 4: Affiliation of co-authorship of the journal articles

IntCollab code	*Int. Nat. Collab Config.*	*Remark*
0	Japanese Organization only	All authors have at least one Japanese affiliation
1	Int. Nat. Collab.: Japan-based entity	Reprint author: Japanese affiliation only
2	Int. Nat. Collab.: Japan-foreign entity	Reprint author: both Japanese and foreign affiliation *(No data)
3	Int. Nat. Collab.: Foreign-based entity	Reprint author: foreign affiliation only
4	No Japanese Organization	Reprint author: foreign affiliation only

The results are shown in Table 5. As for AAS, there is no significance in the result of the *t-test* (95% confidence interval, two sided) for the difference between the mean value of 3 and 4 of the IntCollab code. However, in other results, the mean value of AAS and the cited number showed a significant difference when co-authored internationally. However, the corresponding ratio with newspapers is slightly higher in code 4 (no Japanese organization), but no big difference is observed. As there is a difference in not only AAS but also cited number, the degree of attention of international co-authors is higher than that of co-authorship only in Japan, with respect to the source articles of press releases, and furthermore, foreign-authored papers are more when it was found that attention was high.

Table 5: Differences of AAS and cited number in WoS for the co-authorship status of the article in press release

			log10(score)			*log10(cite)*		
IntCollab code	*papers*	*with News*	*M*	*SD*	*P-value*	*M*	*SD*	*P-value*
0	1135	17.5%	0.676	0.688		1.423	0.489	
t-test for 0-1					5.920E-08			1.529E-11
1	442	17.0%	0.906	0.681		1.607	0.463	
t-test for 1-3					1.272E-12			6.828E-05
3	170	19.4%	1.388	0.754		1.785	0.553	
t-test for 3-4					0.2170			3.047E-03
4	24	25.0%	1.600	0.765		2.156	0.478	

Newspaper covered rate for Journals and Journal category

Table 6 shows the number of reports on journal titles in the source paper of the press release and the number of corresponding newspaper reports and their ratios for the top reported journals. In addition to Multidisciplinary Sciences journals, such as Nature and Science, the coverage rate of astronomy and geoscience magazines, such as Astrophys. J. and Nat. Geosci., and other biological systems such as Nature Genet., Neuron, Cell, and Curr. Biol is high. Meanwhile, the coverage rate is low for leading physics and chemistry journals, such as Phys. Rev. Lett. and Angew. Chem. - Int.

Table 7 shows the reported number of source papers in press releases summarized in the category of WoS, and the corresponding number of newspaper reports and the rate that they were covered. However, because the WoS has multiple field categories assigned to one journal, it is a duplicate count. Table 5 shows that the coverage rate in newspapers varies greatly depending on the field category. In addition to the interests of readers, this may be related to external factors such as Nobel laureate awards and earthquake disasters. Analysis of the strength of the correlation between these is a future task.

Conclusion

We identified the DOIs of the source articles in press releases announcing research findings sent out by Japanese universities and investigated AAS and cited number of the articles. We investigated the differences between co-authorship status, corresponding rate to newspaper, AAS value, and the cited number on the source article of the press release.

As for the corresponding rate, articles by the author of overseas organizations (No Japanese Organization) were somewhat higher, but no big difference was observed. However, the values of AAS and citations tended to be significantly higher for “Japanese Organization only,” “Int. Nat. Collab.: Japan-based entity,” “Int. Nat. Collab.: Foreign-based entity,” and “No Japanese Organization.” In the source article of the press release, there was a tendency for the author of an overseas institution to have higher attention, but this seems to not be directly related to the corresponding rate in the newspaper.

Those with high AAS and citations tended to be covered by newspapers, and those especially published in some specific journals tended to be covered by university press releases. As for future work, we will take into consideration external factors to analyze what kind of cause the press release is linked to in the newspaper publication.

Table 6: Newspaper coverage rates for Journals

rank	Journal	Press Release	with news	rate
1	Nat. Commun.	171	18	10.5%
2	Proc. Natl. Acad. Sci. U. S. A.	144	29	20.1%
3	PLoS One	104	26	25.0%
4	Nature	91	38	41.8%
5	Science	75	20	26.7%
6	Phys. Rev. Lett.	75	3	4.0%
7	Sci Rep	64	11	17.2%
8	J. Neurosci.	33	3	9.1%
9	J. Am. Chem. Soc.	32	2	6.3%
10	J. Biol. Chem.	31	2	6.5%
11	Angew. Chem.-Int. Edit.	30	1	3.3%
12	Nat. Mater.	30	2	6.7%
13	Appl. Phys. Lett.	29	1	3.4%
14	Nat. Phys.	24	2	8.3%
15	Nature Genet.	24	7	29.2%
16	Neuron	20	5	25.0%
17	Cell Reports	17		
18	Appl. Phys. Express	17	1	5.9%
19	Cell	16	6	37.5%
20	Nat. Photonics	15		
21	Curr. Biol.	15	5	33.3%
22	Astrophys. J.	14	4	28.6%
23	Nat. Neurosci.	13	1	7.7%
24	Phys. Rev. B	13		
25	Mol. Cell	13	1	7.7%
26	Nat. Geosci.	12	8	66.7%
27	Nat. Nanotechnol.	12		
28	Immunity	12	4	33.3%
29	Nat. Chem.	12	2	16.7%
30	J. Clin. Invest.	11	4	36.4%
31	Adv. Mater.	11		
32	Astrophys. J. Lett.	10	1	10.0%
33	Nat. Med.	10	3	30.0%

Table 7: Coverage rates for Journal categories

rank	Web of Science Category	journals in PR	with News	rate
1	Multidisciplinary Sciences	651	139	21.4%
2	Cell Biology	188	34	18.1%
3	Biochemistry & Molecular Biology	169	26	15.4%
4	Physics, Applied	132	5	3.8%
5	Chemistry, Multidisciplinary	122	7	5.7%
6	Neurosciences	110	16	14.5%
7	Physics, Multidisciplinary	106	5	4.7%
8	Materials Science, Multidisciplinary	101	4	4.0%
9	Chemistry, Physical	79	2	2.5%
10	Genetics & Heredity	72	16	22.2%
11	Physics, Condensed Matter	68	2	2.9%
12	Nanoscience & Nanotechnology	54	1	1.9%
13	Medicine, Research & Experimental	41	13	31.7%
14	Astronomy & Astrophysics	33	10	30.3%
15	Immunology	32	8	25.0%
16	Optics	26		
17	Geosciences, Multidisciplinary	26	12	46.2%
18	Plant Sciences	25	1	4.0%
19	Developmental Biology	24	2	8.3%
20	Ecology	24	9	37.5%
21	Evolutionary Biology	23	8	34.8%
22	Biology	22	6	27.3%
23	Cell & Tissue Engineering	19	10	52.6%
24	Microbiology	19	1	5.3%
25	Oncology	15	6	40.0%
26	Biotechnology & Applied Microbiology	15	2	13.3%
27	Biophysics	14		
28	Biochemical Research Methods	14		
29	Environmental Sciences	13	4	30.8%
30	Virology	13	1	7.7%
31	Endocrinology & Metabolism	13	6	46.2%
32	Medicine, General & Internal	13	1	7.7%
33	Parasitology	12	1	8.3%
34	Hematology	12	5	41.7%
35	Chemistry, Analytical	11		
36	Clinical Neurology	11	3	27.3%
37	Peripheral Vascular Disease	10	4	40.0%

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References

Altmetric (2018), Altmetric.com: https://www.altmetric.com (referenced March, 2018)

Clarivate Analytics (2018), https://clarivate.com/products/web-of-science/ referenced March, 2018)

Nishizawa, M. & Sun, Y. (2012), “How are universities collaborating with industry in Japan? --- An investigation based on newspaper press releases,” in Proceedings on COLLNET and WIS 2012, Soul, Koria.

Nishizawa, M. & Sun, Y. (2014), “How well do newspapers describe scientific research? --- Comparison between press releases and two different national newspapers in Japan,” in Proceedings on COLLNET and WIS 2014, pp.373-379, Ilmenau, Germany.

Nishizawa, M. & Sun, Y. (2016), “How is scientific research announced in Press Release? --- Focusing on its relationships with journal indicators,” in Proceedings on COLLNET and WIS 2016, Nancy, Fance.

Nishizawa, M. & Sun, Y. (2017), How is academic research reported in the media? - Relationships between attention in the press and social media, in Proceedings on COLLNET and WIS 2018, Canterbury, UK

Nichigai Associates, Inc. (2018), Language resources, http://www.nichigai.co.jp/sales/corpus.html (referenced March, 2018, in Japanese)

Nikkei press release (2018), http://release.nikkei.co.jp/ (referenced March, 2018, in Japanese)