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# Inequities of article processing charges How the oligopoly of academic publishers profits from open access

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### Outline

- $\rightarrow$ Introduction
- →APCs of oligopoly journals
   →Canadian Tri-Agency data
   →Global data
- $\rightarrow$ Conclusions

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### What is OA?

→ Serials crisis Unaffordability of journal subscriptions

#### $\rightarrow$ Digital era

From print to online publishing

ightarrow OA movement

*Free, unrestricted access and reuse of peer-reviewed journal literature* 

 $\rightarrow$ OA manifestos

- ightarrow Budapest OA Initiative (2002)
- → Bethesda Statement on OA Publishing (2003)
- → Berlin Declaration on OA to Knowledge in the Sciences and the Humanities (2003)

"By open access to this literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited<mark>."</mark>

#### BOAI (2002, para. 3)

### OA models

#### ightarrow Published in OA journal

- → Gold with APC Author pays
- → Gold without APC (=Diamond/Platinum) Free for author – institution/society pays
- → Via Transformative Agreement (=Read & Publish) Free for author – library pays
- ightarrow Published in subscription journal
  - → Hybrid *Author and library pay*
  - $\rightarrow$  Bronze

Unclear – lacking license for reuse

 $\rightarrow$  Green

*Self-archiving, free for author – possible copyright restrictions* 

 $\rightarrow$  (Black)

Unauthorized (e.g., SciHub)



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### Common misconceptions

#### $\rightarrow$ Cost of OA

#### OA > APCs

 $\rightarrow$  Diamond and green OA are free to authors

#### $\rightarrow$ OA and quality

#### OA ≠ predatory publishing | peer review ≠ publisher

 $\rightarrow$  Gatekeeping is not dependent on publisher

ightarrow Peer review is done by scholarly community

#### $\rightarrow$ OA and impact

#### *journal prestige ≠ article impact*

- $\rightarrow$  OA leads to larger readership than closed access
- $\rightarrow$  Green OA articles obtain highest citation rates



Field-normalized citation rate of a random sample of journal articles and reviews with a DOI, published between 2009 and 2015, covered in Web of Science.

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### Growth of OA

→ Measuring OA depends on definition, operationalization and time of measurement



Archambault, É., Amyot, D., Deschamps, P., Nicol, A., Rebout, L. & Roberge, G. (2013). Proportion of Open Access Peer-Reviewed Papers at the European and World Levels 2004-2011. *Report for the European Commission*. http://www.science-metrix.com/pdf/SM\_EC\_OA\_Availability\_2004-2011.pdf
 Piwowar et al. (2018). The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ*, 6, e4375. https://doi.org/10.7717/peerj.4375

#### BOAI 20th Anniversary Recommendations

- 1. Host OA research on open infrastructure
- 2. Reform research assessment and rewards to improve incentives
- 3. Favor inclusive publishing and distribution channels that never exclude authors on economic grounds

Take full advantage of OA repositories an no-APC journals ("green" and "diamond" OA). Move away from article processing charges (APCs).

4. When we spend money to publish OA research, remember the goals to which OA is the means

Favor models which benefit all regions of the world, which are controlled by academicled an nonprofit organizations, which avoid concentrating new OA literature in commercially dominant journals, and which avoid entrenching models in conflict with these goals. Move away from read-and-publish agreements.









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### Cost of APCs

- $\rightarrow$  How much APCs *should* cost
  - $\rightarrow$  Up to \$1,000 (Fair Open Access Alliance)
- → How much APCs *actually* cost

"The ability and willingness of consumers to pay for products influences supply-side pricing decisions." (Siler & Frenken, 2020)

- $\rightarrow\,$  Average gold APC
  - ightarrow Journal level
    - ightarrow \$889 (Siler & Frenken, 2020)
    - ightarrow \$958 (Morrison et al., 2021)
  - $\rightarrow$  Article level
    - $\rightarrow$  \$1,800 (Solomon & Björk, 2016)
    - $\rightarrow$  \$1,626 (Morrison et al., 2021)

Solomon, D., & Björk, B.-C. (2016). Article processing charges for open access publication—The situation for research intensive universities in the USA and Canada. PeerJ, 4, e2264. https://doi.org/10.7717/peerj.2264

#### $\rightarrow$ Average hybrid APC

- $\rightarrow$  \$3,000 (Solomon & Björk, 2016)
- ightarrow \$2,600 (OpenAPC, 2022)



### Systemic problems

- → Dependencies on proprietary infrastructure
  - $\rightarrow$  Knowledge as commodity
  - ightarrow Prestige of publishers
  - $\rightarrow$  Academic reward system
  - $\rightarrow$  Hiring, tenure and promotion

- $\rightarrow$  Exacerbating existing inequities
  - $\rightarrow$  Geography
  - $\rightarrow$  Gender
  - $\rightarrow$  Career stage
  - $\rightarrow$  Language
  - $\rightarrow$  Discipline
  - $\rightarrow$  Funding
  - $\rightarrow$  Diverse forms of knowledge

Olejniczak, A. J., & Wilson, M. J. (2020). Who's writing open access (OA) articles? Characteristics of OA authors at Ph.D.-granting institutions in the United States. *Quantitative Science Studies*, 1(4), 1429–1450. https://doi.org/10.1162/qss\_a\_00091

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Chan, L., Hall, B., Piron, F., Tandon, R., & Williams, W. L. (2020). *Open Science Beyond Open Access: For and with communities, A step towards the decolonization of knowledge*. https://doi.org/10.5281/ZENODO.3946773

Siler, K., & Frenken, K. (2020). The pricing of open access journals: Diverse niches and sources of value in academic publishing. *Quantitative Science Studies*, 1(1), 28–59. https://doi.org/10.1162/qss\_a\_00016

#### APCs and OA

 $\rightarrow$  Alternatives to APCs

"systematically under-noticed, under-discussed, under-appreciated, underfunded and under-used" (BOAJ, 2022)

- $\rightarrow$  Gold journals w/out APC (diamond/platinum OA):
  - ightarrow 73% of gold journals in DOAJ have no APCs
  - ightarrow 43% of articles without APCs
- ightarrow Green OA
  - ightarrow free for authors
  - $\rightarrow$  highest citation impact
  - → complicated by publisher through copyright restrictions (embargoes, versions, repositories)

Bosman, J., Frantsvåg, J.E., Kramer, B., Langlais, P.-C., & Proudman, V. (2021). *OA Diamond Journals Study. Part 1: Findings*. Zenodo. https://doi.org/10.5281/ZENODO.4558704 Morrison, H., Borges, L., Zhao, X., Kakou, T. L., & Shanbhoug, A. N. (2021). Open access journals & article processing charges 2011—2021. http://hdl.handle.net/10393/42327 Siler, K., & Frenken, K. (2020). The pricing of open access journals: Diverse niches and sources of value in academic publishing. *Quantitative Science Studies*, 1(1), 28–59. https://doi.org/10.1162/qss\_a\_00016



# APCs of oligopoly journals

#### Motivation

- $\rightarrow$  Oligopoly of academic publishers control majority of journal publishing
  - $\rightarrow$ Elsevier
  - $\rightarrow$ Sage
  - $\rightarrow$ Springer-Nature
  - $\rightarrow$ Taylor & Francis
  - $\rightarrow$ Wiley
- → Library subscriptions and APCs (public tax dollars) to read/publish research lead to profits of >30%
- $\rightarrow$  Resources intended to support research are leaving academia to maximize shareholder profits
- $\rightarrow$  APCs shift barriers from reader to author, exacerbating inequities



#### Research questions

→ What is the estimated amount of APCs for gold and hybrid OA articles indexed in WoS in journals published by oligopoly (Elsevier, Sage, Springer-Nature, Taylor & Francis, Wiley) published between 2015 and 2018? *in collaboration with Philippe Mongeon, Lisa Mathias & Marc-André Simard* 

→ What is the estimated amount of APCs for Canadian gold and hybrid OA articles indexed in WoS that acknowledge the Canadian Tri-Agency in journals published by oligopoly publishers between 2015 and 2018? *Master's thesis, uOttawa ÉSIS* 

### Methods

- ightarrowGlobal data
  - ightarrow Articles with DOI 2015-2018 (WoS)
    - $\rightarrow$  Number of publications per journal per year
    - $\rightarrow$  Oligopoly publishers and associated imprints and/or subsidiary publishers
  - $\rightarrow$  Article-level OA status (Unpaywall)
    - ightarrow Gold or hybrid journals
  - $\rightarrow$ APC list prices
- ightarrow Canadian Tri-Agency data
  - ightarrowsame as above
  - ightarrow Publications with institutional address in Canada
  - → Funding acknowledgements (WoS)
    - $\rightarrow$  Acknowledging funding from Tri-Agency (CIHR, SSHRC, NSERC)

### Methods

 $\rightarrow$  APC list prices

- →List prices for oligopoly publishers open dataset: Matthias (2020)
- →List prices for gold OA journal open dataset: Morrison (2021)
- →Manual look up of historical APCs Internet Archive Wayback Machine

→Filling remaining gaps applying closest available APCs 51

#### Methods: Internet Archive Wayback Machine

Sage journal page fails to load all information

	p://iournals.cagonub.com/action/see	kiaAbsant				
Machine 19,1 13 D	B28 captures           Dec 2016 - 7 May 2022	KieAbsent		lis. Alain	20 > 2016 2018 -	About this
	SAGE journa	S Journals Re	esources My Tools Searc	ch all SAGE Journals Q s Advanced	Sign in: My Account Institution	
	SAGE Video Streaming video collections	SAGE Knowledge The ultimate social sciences library	SAGE Research Methods The ultimate methods library	SAGE Stats Data on Demand	CQ Library American political resources	
	SAGE Journals	Browse	Resources	Opportunities		
	About	Health Sciences	Authors	Advertising		
	Privacy Policy	Life Sciences	Editors	Reprints		
	Terms of Use	Materials Science &	Reviewers	Content Sponsorships		
	Contact Us	Engineering	Librarians	Permissions		
	Help	Social Sciences & Humanities	Researchers			
		Journals A-Z	Societies			
					Copyright © 2017 by SAGE Publications	



#### Methods: Internet Archive Wayback Machine

Wiley made list prices downloadable in 2017

INTERNET ARCHIVE       http://onlinelibrary.wiley.com/browse/publications?type=journal&activeLetter=A         57 captures       22 Aug 2010 - 1 Oct 2019	Go FE	B MAR SEP <b>17</b> > 4 2015 2016	
Wiley Online Library	👗 Log in / Register 💿		
Publications A - Z         ALL A B C D E F G H I J K L M N O P Q R S T U V W         Select All Get email alerts         VIEW 1-40   41-80   81-120   121-160   Next>	Interaction         https://authorservices.wiley.com/author-resources           9 captures         9 captures           13 jul 2017 - 26 Dec 2021         13 jul 2017 - 26 Dec 2021	nrces/Journal-Authors/licensing-open-access/open-access/article-publication	n-charges.html Go JUN JUL JAN 13 2016 2017 2021
AAHE-ERIC/Higher Education Research Report         Currently known as:       ASHE Higher Education Report         Abacus         About Campus         Academic Emergency Medicine         Academic Review	<ul> <li>Author Resources</li> <li>Journal Authors</li> <li>Find a Journal</li> <li>Prepare</li> <li>Submission &amp; Peer Review</li> </ul>	Find journal Prepare Defendation 2 (Mension 2) (Mensi	Fully Open Access Journals
Currently known as: Design Management Journal Accounting & Finance Accounting Forum Accounting Perspectives Acta Anaesthesiolonica Scandinavica	<ul> <li>Licensing &amp; Open Access</li> <li>Licensing</li> <li>Open Access</li> <li>Self-Archiving</li> <li>OnlineOpen</li> </ul>	Price List for journals offering OnlineOpen, Wiley's hybrid gold open access option OnlineOpen Price List	Price List for Wiley's fully open access journal portfolio Open Access Price List
	Data Sharing Author Compliance Tool		

#### Limitations

 $\rightarrow WoS$ 

→Bias against non-English, non-Western publications
→Focus on STEMM

- $\rightarrow$  Estimation, not calculation of actual prices paid  $\rightarrow$  Do not account for discounts or waivers
- $\rightarrow \rm Link$  to Tri-Agency funding
  - $\rightarrow$ Not capturing all articles supported by Tri-Agency funding

 $\rightarrow$  Dependant on author self-reporting

 $\rightarrow$  No standardized format to acknowledge funders

 $\rightarrow$ Unclear who paid APC of multi-authored publications



# Canadian Tri-Agency data

#### Canadian WoS oligopoly articles acknowledging Tri-Agency funding





### Tri-Agency: Hybrid and gold APCs per funder





#### Tri-Agency: Average hybrid and gold APCs per funder

	Gold			Hybrid			
	Ν	Average APC (median)	Max APC	Ν	Average APC (median)	Max APC	
All Tri-Agency	6,892	<mark>\$2,241</mark> (\$2,145	) \$5,200	4,097	<mark>\$2,974</mark> (\$3,000	) \$5,200	
CIHR	3,534	\$2,571 (\$2,145	) \$5,200	1,739	\$3,390 (\$2,950	) \$5,200	
NSERC	3,668	\$2,022 (\$1,760	) \$5,200	2,424	\$2,782 (\$2,950	) \$5,200	
SSHRC	126	\$\$1,703 (\$1,805	) \$5,200	211	\$2,538 (\$3,000	) \$5,000	
Jointly Administered	1,306	\$2,208 (\$2,145	) \$5,200	604	\$3,296 (\$3,000	) \$5,200	

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#### Tri-Agency: APCs per publisher per funder





# Global data

#### WoS: APCs 2015-2018



Butler, L.-A., Mathias, L., Simard, M.-A., Mongeon, P., & Haustein, S. (submitted). The oligopoly's shift to open access publishing: How for-profit publishers benefit from gold and hybrid article processing charges. *Science and Technology Indicators Conference*, Granada, Spain.

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#### WoS: APCs per year



Butler, L.-A., Mathias, L., Simard, M.-A., Mongeon, P., & Haustein, S. (submitted). The oligopoly's shift to open access publishing: How for-profit publishers benefit from gold and hybrid article processing charges. Science and Technology Indicators Conference, Granada, Spain.

#### WoS: APCs per publisher



Butler, L.-A., Mathias, L., Simard, M.-A., Mongeon, P., & Haustein, S. (submitted). The oligopoly's shift to open access publishing: How for-profit publishers benefit from gold and hybrid article processing charges. Science and Technology Indicators Conference, Granada, Spain.



### WoS: Gold and hybrid APCs per publisher



- → Springer-Nature: 5% (12,955) → Taylor & Francis: 10% (2,702)
- → Taylor & Francis: 10% (2,70
  → Wiley: 2% (442)



Butler, L.-A., Mathias, L., Simard, M.-A., Mongeon, P., & Haustein, S. (submitted). The oligopoly's shift to open access publishing: How for-profit publishers benefit from gold and hybrid article processing charges. Science and Technology Indicators Conference, Granada, Spain.

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### WoS: APCs per journal

#### $\rightarrow$ Top 50 by total APC

Scientific Reports		\$118,471,895
Nature Communications		\$83,860,400
Cell Reports	\$21,065,000	
BMC Public Health	\$10,437,570	
BMC Genomics	\$8,927,490	
Current Biology	\$8,868,400 - Hybrid	
BMC Cancer	\$8,841,690	
Cell	\$8,225,800 - Hybrid	
Journal of High Energy Physics	\$7,336,530	
Neuron	\$7,278,000 - Hybrid	
Cell Death & Disease	\$6.711.355	
BMC Health Services Research	\$6,619,470	
Ecology and Evolution	\$6,345,300	
Molecular Cell	\$6,159,400 - Hybrid	
BMC Infectious Diseases	\$6.072.495	
British Journal of Cancer	\$6.054.100 - Hybrid	
Parasites & Vectors	\$5.381.130	
Advances in Mechanical Engineering	\$5,366,000	
Trials	\$5,208,060	
BMC Bioinformatics	\$4.637.490	
Malaria Journal	\$4.530.730	
Journal of Vascular Surgery	\$4.383.400 - Hybrid	
Translational Psychiatry	\$4.153.890	
Advanced Science	\$4.093.500	
BMC Musculoskeletal Disorders	\$4.021.875	
BMC Complementary and Alternative Medicine	\$3.944.655	
Biology of Blood and Marrow Transplantation	\$3.917.850 - Hybrid	
Developmental Cell	\$3,805,800 - Hybrid	
Cancer Medicine	\$3,698,090	
SpringerPlus	\$3.609.610	
BMC Pregnancy and Childbirth	\$3.605.745	
Structure	\$3.591.200 - Hybrid	
Biophysical Journal	\$3,556,800 - Hybrid	
EBioMedicine	\$3,472,600	FISEVIER
OncoTargets and Therapy	\$3,358,740	LISCVICI
BMC Psychiatry	\$3,352,635	
International Journal of Distributed Sensor Networks	\$3,262,000	0
Stem Cell Reports	\$3,234,000	Sade
Arthritis Research & Therapy	\$3,209,125	Juge
Immunity	\$3.196.800 - Hybrid	-
Journal of Investigative Dermatology	\$3,179,500 - Hybrid	
Cell Metabolism	\$3.057.000 - Hybrid	Springer_Nature
Critical Care	\$3.022.535	Springer-Mature
Nanoscale Research Letters	\$3.003.690	
Angewandte Chemie International Edition	\$2,961,500 - Hybrid	
Journal of Cellular and Molecular Medicine	\$2,943,100	Taylor & Francic
Annals of Oncology	\$2,900,250 - Hybrid	
BMC Veterinary Research	\$2,871,990	,
World Journal of Surgical Oncology	\$2,840,580	
Journal of Translational Medicine	\$2,803,515	Milov
Biotechnology for Biofuels	\$2,768,500	
		- /

#### $\rightarrow$ Top 50 by average APC



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#### Next steps

- $\rightarrow$  Additional analyses
  - $\rightarrow$ Per discipline
  - $\rightarrow$ Per country
  - $\rightarrow$ Citations
- $\rightarrow {\rm Tri}{\rm -angulation}$  with data from Open APC



# Conclusions

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### Conclusions

#### $\rightarrow$ Inequities of APCs

- $\rightarrow$  Exclusion of authors on economic grounds
- →Socio-economic factors influence market pricing
- $\rightarrow$  Spending money not to improve OA but to finance a business

#### ightarrow Change the system

- →Untangling academic reward system from publisher prestige
- → Financial support of publishing, not companies

"To encourage fairer, more diverse open access practices worldwide, governments, research funders and UNESCO should financially and institutionally support a wide range of actors...rather than giving precedence and fiscal advantage to international, for-profit, unilingual publishing industries."

Chan et al (2020)



# Thank you!

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