LIBER QUARTERLY
The Journal of the Association of European Research Libraries
Vol. 28 (2018) xx–xx | e-ISSN: 2213-056X

A Very Long Embargo: Journal Choice Reveals Active Non-Compliance with Funder Open Access Policies by Australian and Canadian Neuroscientists

Shaun Yon-Seng Khoo

Center for Studies in Behavioral Neurobiology/Groupe de Recherche en Neurobiologie Comportementale, Department of Psychology, Concordia University, Montreal, Canada
shaun.khoo@concordia.ca, orcid.org/0000-0002-0972-3788

Belinda Po Pyn Lay

Center for Studies in Behavioral Neurobiology/Groupe de Recherche en Neurobiologie Comportementale, Department of Psychology, Concordia University, Montreal, Canada
belinda.lay@concordia.ca

Abstract

Research funders around the world have implemented open access policies that require funded research to be made open access, usually by self-archiving, within 12 months of publication. Elsevier is unique among major science publishers because it produces several journals with non-compliant self-archiving embargoes of more than 12 months. We used Elsevier's Scopus database to study the rate at which Australian and Canadian neuroscientists publish in Elsevier's non-compliant (embargoes >12 months) and compliant journals (embargoes ≤12 months). We also examined publications in immediate open access neuroscience journals that had the DOAJ Seal and neuroscience publications in open access mega-journals. We found that the implementation of Australian and Canadian funder open access policies in 2012/2013 and 2015 did not reduce the number of publications in non-com-

Uopen Journals | http://liberquarterly.eu/ | DOI: 10.18352/lq.10252

pliant journals. Instead, scientific output in all publication types increased with the greatest growth in immediate open access journals. This data suggests that funder open access policies that are similar to the Australian and Canadian policies are likely to have little effect beyond an association with a general cultural trend towards open access.

Key Words: open access; author choice; journal selection; embargo; self-archiving; Elsevier

1. Introduction

Funders around the world have adopted open access policies that require funded work to be published in journals that are open access or self-archived within a certain time-frame (Prosser, 2007; Xia et al., 2012). Notable policies include the United States National Institutes of Health implemented in 2008 (Suber, 2008), the policies of Research Councils UK (RCUK), the UK Research Excellence Framework, and member states of the European Union (Higher Education Funding Council for England, 2016; Suber, 2012). Open access policies are implemented to ensure that taxpayers and other stakeholders are able to access the work that they fund and to support research and innovation by removing barriers to access. In support of this, previous work has shown that open access papers receive citations at a comparable, or even higher, rate than papers in subscription journals (Björk & Solomon, 2012; Gargouri et al., 2010).

Open access mandates are typically based on a green self-archiving model that requires researchers to deposit their accepted manuscript (Harnad et al., 2004, 2008). In the green open access model, authors publish with subscription journals and are required to deposit the accepted manuscript version of their paper in their institutional repository so that it can be made publicly available within a specified time-period. The allowed embargo period is usually 12 months, although Europe is moving towards a stricter 6 month period in the Horizon 2020 programme (European Commission, 2018). The RCUK policy provides an exception to the dominance of green open access policies with its strong preference for immediate open access and, as of 2013, was revised to provide block grants to institutions for open access payments (Ashworth, Mccutcheon, & Roy, 2014; Harnad, 2013). Most other jurisdictions such as the US, Canada, and Australia have introduced green open access

policies that require papers to be publicly available within 12 months of publication through the self-archiving route.

The effectiveness of green open access policies has been heavily disputed. Although the strength of an open access policy can improve rates of self-archiving, overall rates of self-archiving remain low – in the order of 30% or less (Harnad, 2013; Vincent-Lamarre, Boivin, Gargouri, Larivière, & Harnad, 2015). In contrast, over 90% of academics believe that it is important to make research articles freely available to everyone (Zhu, 2017). But despite this widespread support and decades of effort by research librarians and open access advocates, rates of deposit have remained low while pirate open access has rapidly become widespread (Bohannon, 2016; Green, 2017).

It has been suggested that most academics are generally aware of open access policies but find compliance difficult due to time constraints or confusion about policy requirements or journal policies (Charbonneau & McGlone, 2013). Others have argued that academics, in particular early career researchers, are constrained by the need to publish in prestigious outlets that have high impact factors and accordingly deprioritise their support for open access in order to ensure their continuing employment (Nicholas et al., 2017). The vast majority of journals allow self-archiving after a specified embargo period (Harnad et al., 2008), so green open access theoretically allows for compliance with open access policy in almost any journal except where a journal's embargo period is longer than the 12 months specified by funders.

Journal choice thus offers a way of assessing active disregard for open access policies rather than a passive failure to self-archive. If the policy is effective, then journals that embargo an author's accepted manuscript for longer than the specified timeframe should see a reduction in submissions over time. Australia and Canada both recently introduced open access policies that require self-archiving within 12 months of publication (Moher et al., 2016; Steele, 2013). The National Health and Medical Research Council (NHMRC) in Australia introduced its open access policy in July 2012 and the Australian Research Council (ARC) introduced its policy at the beginning of 2013. While the Canadian Institutes of Health Research (CIHR) has had an open access policy for some time, the tri-agency open access policy introduced in 2015 now covers all of the major federal Canadian research funders. Therefore, if funder open access policies are effective then there should be a reduction in the number of publications in journals that have embargoes of more than 12 months for Australia and Canada.

Fortunately for neuroscientists, almost all of the journals owned by major publishers are compliant with 12-month green open access policies. All of Springer Nature's subscription journals have embargoes of 6 months (Nature, 2018) or 12 months (Springer, 2018). Wiley embargoes author manuscripts for a standard 12-month period for scientific journals and has funder agreements with the ARC and NHMRC (Wiley, 2018). Commendably, SAGE Publishing's self-archiving policy allows immediate deposit with an institutional repository, with embargo periods only applying to other databases (SAGE Publishing, 2018). Elsevier is the only major scientific journal publisher without a standard embargo policy and publishes a list of journal-specific embargo periods. Gray (2018) has maintained a public dataset that tracks the vast array of Elsevier's journal-specific embargo periods since it began publishing its list in 2013. It shows that Elsevier retains a large number of journals with non-compliant (>12 months) embargo periods that have remained stable over this period.

We therefore studied the rate at which academics in neuroscience (our field of study) publish in journals with varying timeframes for open access. Based on previous studies that have shown limited practical enthusiasm for self-archiving (Charbonneau & McGlone, 2013; Vincent-Lamarre et al., 2015), we hypothesised that Australian and Canadian neuroscientists would not reduce their propensity to publish in non-compliant Elsevier journals. We used Elsevier's Scopus database to examine the number of publications from Australian and Canadian neuroscientists in both compliant and non-compliant Elsevier journals from 2010 to 2017. For comparison, we also studied publications in open access neuroscience journals with the Directory of Open Access Journals (DOAJ) Seal and neuroscience publications in open access mega-journals (OAMJs). Our findings support the view that funder open access policies have little to no impact on journal selection in neuroscience.

2. Methods

We studied the rate of publication of neuroscientists with affiliations based in Australia and Canada from 2010 to 2017 in four types of journal: non-compliant Elsevier journals with embargoes of >12 months, compliant subscription journals published by Elsevier with embargoes of ≤12 months, discipline-specific immediate open access journals, and OAMJs.

We selected Elsevier journals from the list compiled by Gray (2018) based on embargo length. By manually scanning journal titles for words related to neuroscience, psychology, or neurological or psychological disorders, we identified 30 journals with non-compliant embargo periods of 18–24 months. For comparison, we also identified 58 journals with compliant 12-month embargo periods. We selected only journals that had the same embargo period for the entire 2013–2017 period as recorded by Gray (2018) and published neuroscience and psychology papers in English.

To select discipline-specific immediate open access journals, we searched the Directory of Open Access Journals (DOAJ) for journals with subject areas of neurosciences, biological psychiatry, neuropsychiatry, or psychology. We selected only journals (n=20) that publish in English, had the DOAJ seal, had been listed on the DOAJ since before 2010, and had been indexed by Scopus prior to 2010. We called these journals immediate open access because the term 'gold open access' is sometimes conflated with the article processing charge business model (Beall, 2013) and some open access advocates distinguish between 'gold' and fee-free 'platinum' journals (Björk, 2017). They were published by Frontiers (n=11), Springer (n=3 under BMC and n=1 under the Springer brand), Hindawi (n=3), and PAGEPress (n=1).

We also examined neuroscience publications across OAMJs (n=8). While PLOS ONE and Scientific Reports are the best known OAMJs, we also counted contributions from the much younger and/or smaller OAMJs PeerJ, Royal Society Open Science, Heliyon, BMJ Open, Biology Open, and FEBS Open Bio. Although several of these journals began after 2010, we did not apply exclusion criteria to this subset of journals because the OAMJ segment of publishing has experienced rapid shifts, particularly with respect to the rapid popularity of Scientific Reports.

2.1. Scopus Searches

We used Elsevier's Scopus database because it is a widely used and authoritative bibliometric database and would likely have accurate metadata for Elsevier journals. In mid-2018, we conducted searches (Table 1) for the total number of publications from Australia, Canada, the United States (US), and United Kingdom (UK) in a particular journal using the journal's ISSN and

Table 1: Example Scopus Search Strings.

Category	Example String
Journal total	(ISSN(0166–4328) AND (EXCLUDE (DOCTYPE,"ip")))
Funder acknowledgement	(ISSN(0166–4328) AND (FUND-ALL(National Health and Medical Research Council) OR FUND-ALL(NHMRC)OR FUND-ALL(Australian Research Council)OR FUND-ALL(ARC))) AND (LIMIT-TO (AFFILCOUNTRY,"Australia")) AND (EXCLUDE (DOCTYPE, "ip")) AND (LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010))
OAMJ total	(ALL (neuroscience) AND ISSN (1932–6203) AND (EXCLUDE (DOCTYPE, "ip"))
OAMJ funder acknowledgement	(ALL (neuroscience) AND ISSN(1932–6203) AND (FUND-ALL(Canadian Institutes of Health Research)OR FUND-ALL(CIHR) OR FUND-ALL(Natural Sciences and Engineering Research Council) OR FUND-ALL(NSERC))) AND (LIMIT-TO (AFFILCOUNTRY, "Canada")) AND (EXCLUDE (DOCTYPE, "ip")) AND (LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010))

used the results analysis tool to export total publications per country per year for 2010–2017. We also conducted searches for publications that explicitly acknowledged either Australian funders who support neuroscience (ARC and NHMRC) or Canadian funders who support neuroscience (CIHR and the National Sciences and Engineering Research Council [NSERC]). In both search types, we excluded articles in press because these would have a final publication date of 2018 or later. For comparison with the Australian and Canadian data, we also obtained national publication counts for the US and UK. For OAMJs, we identified 'neuroscience' publications if the word 'neuroscience' occurred anywhere in the article's metadata.

2.2. Statistical Analysis and Material Availability

Journal-specific totals were collated and summed to provide national totals or funder-acknowledging totals. The national totals and funder-acknowledging

totals were analysed using the free open source statistics package JASP (JASP Team, 2018). Variables encoding for the existence of combined NHMRC/ARC open access policies (AU-policy) from 2013 onwards and tri-agency policy (CA-policy) from 2015 onwards were included in the data. Step-wise regression analysis was then performed with year, AU-policy, and CA-policy as independent variables and the number of publications as a dependent variable. The full list of journal titles, underlying data, and statistical analysis results are available on Figshare (Khoo & Lay, 2018).

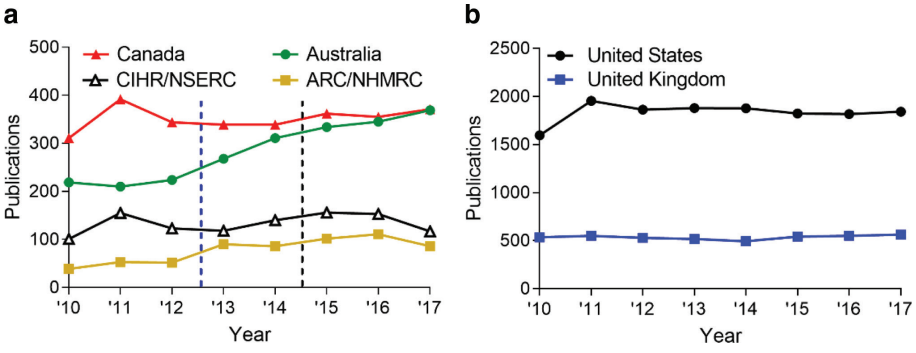
3. Results

3.1. Non-Compliant Journal Publishing

Scopus data shows that there are potentially hundreds of papers published each year in Elsevier journals with non-compliant self-archiving embargoes (n=30). As shown in Figure 1a, the national totals were higher than the funder-acknowledging totals but neither the introduction of the NHMRC and ARC's open access policies (shown by the dashed blue line before 2013), nor the tri-agency open access policy in Canada in 2015 (shown by the black dashed line) had any effect on reducing Australian or Canadian neuroscientists' rate of publication in non-compliant Elsevier journals.

Stepwise linear regression produced a model (R^2=0.945, F(1,6)=103.2, p<0.001) for the Australian national total with only the year as a predictor (β=24.98,

Fig. 1: Publications in non-compliant journals with (a) Australian or Canadian affiliations and funding or (b) US or UK affiliations.



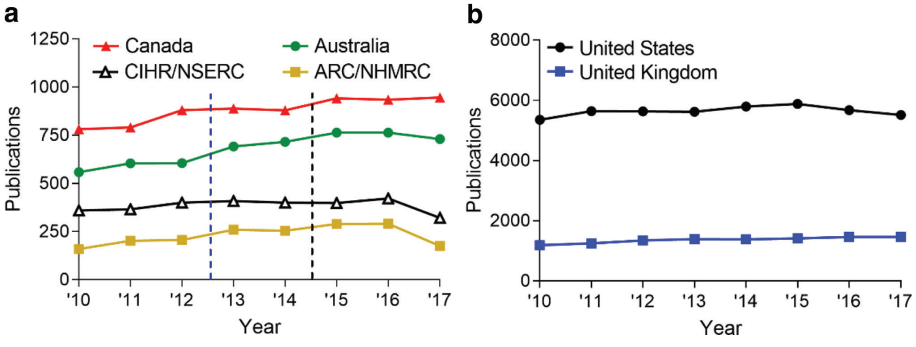
p<0.001). Paradoxically, the regression model for funder-acknowledging totals (R^2=0.871, F(1,6)=40.47, p<0.001) included the Australian open access policy as a predictor, but with a positive coefficient (β=47, p<0.001). Stepwise linear regression found no significant predictors for the Canadian national total or funder-acknowledging totals. Similarly, there was no decrease in publishing in non-compliant journals in the US or UK (Figure 1b) because there were no significant predictors in either case.

3.2. Compliant Subscription Journals

Elsevier publishes many subscription journals with compliant self-archiving embargoes. We identified 58 journals within the fields of neuroscience and psychology. As shown in Figure 2a there appears to be little to no effect of funder open access policy on the rate at which authors publish in compliant subscription journals. The blue dashed line again represents the Australian policies implemented from 2013 and the black line represents Canada's tri-agency policy in effect from 2015.

Stepwise linear regression produced a model (R^2=0.878, F(1,6)=43.34, p<0.001) for the Australian national total with only the Australian policy as a predictor (β=143.4, p<0.001). However, when applied to papers that acknowledged Australian funders there was no significant regression equation. For Canadian neuroscience, a significant regression model was found for the

Fig. 2: Publications in compliant subscription journals with (a) Australian or Canadian affiliations and funding or (b) US or UK affiliations.



national total (R^2=0.861, F(1,6)=37.16, p<0.001) with year as the only predictor (β=24.31, p<0.001). Again, there was no significant regression equation for papers that acknowledged Canadian funders.

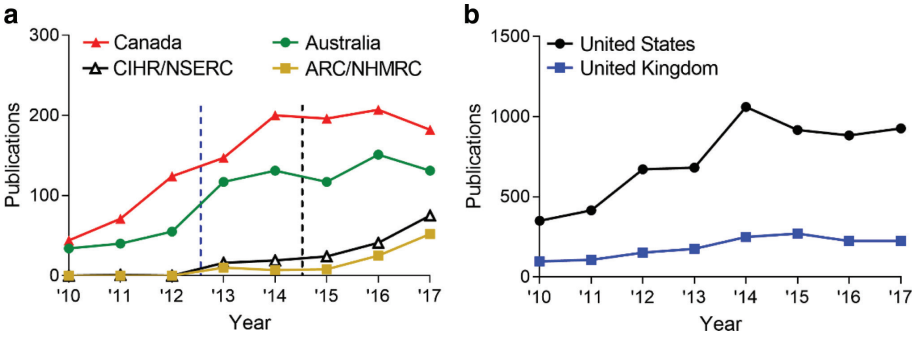
As shown in Figure 2b, the US had high output throughout 2010–2017. There was no significant regression equation for the US national total in compliant subscription journals. For the UK, a significant regression equation was found (R^2=0.894, F(1,6)=50.53, p<0.001) with year as the only predictor (β=37.5, p<0.001).

3.3. Immediate Open Access Journals

It is possible that funder open access policies are generally driving uptake of open access publishing opportunities, so we also examined open access neuroscience journals. Since Elsevier does not publish a comparable number of fully open access journals, we examined 20 journals with the DOAJ Seal that publish neuroscience papers. We found that immediate open access outputs were increasing for both Australia and Canada (Figure 3a) and the US and UK (Figure 3b). However, the existence of Australian funder policy (blue dashed line) or Canadian funder policy (black dashed line) had little effect.

Stepwise linear regression produced a model (R^2=0.932, F(1,6)=82.89, p<0.001) for the Australian national total with the Australian policy as a predictor of

Fig. 3: Publications in open access neuroscience journals with (a) Australian or Canadian affiliations and funding or (b) US or UK affiliations.



increased output (β=86.4, p<0.001). For papers that acknowledge Australian funders, the regression equation (R^2=0.691, F(1,6)=13.4, p=0.011) only included year as a predictor (β=6.071, p=0.011). Regression equations for Canadian national totals (R^2=0.81, F(1,6)=25.59, p=0.002) and funder acknowledgements (R^2=0.823, F(1,6)=27.93, p=0.002) both included year as the only predictor (β=22.8 and 9.524, respectively, p=0.002).

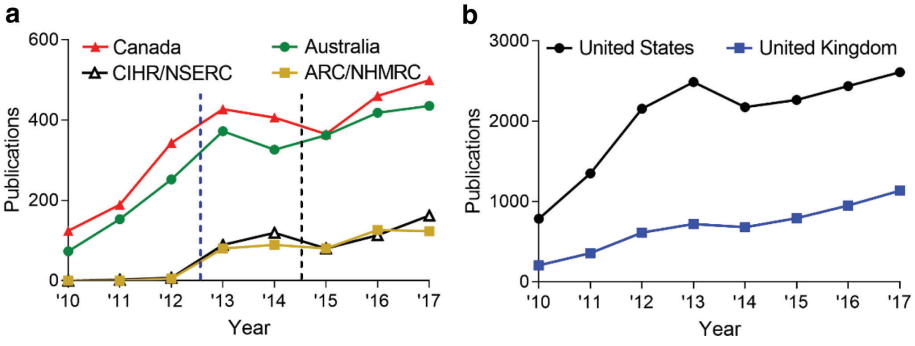
For the US national total, stepwise linear regression produced a significant model (R^2=0.734, F(1,6)=16.54, p=0.007) with year as its only predictor (β=89.14, p=0.007). For the UK, the regression equation (R^2=0.768, F(1,6)=19.86, p=0.004) had the existence of the Australian funder policy (which coincided with the 2013 revised RCUK policy) as its only predictor (β=109.9, p=0.004).

3.4. Open Access Mega-Journals

Many neuroscientists publish articles in OAMJs, which are large interdisciplinary journals that use peer review to screen predominantly for scientific or technical soundness (Björk & Catani, 2016; Wakeling et al., 2017). We searched for neuroscience articles published in 8 OAMJs and found that neuroscience outputs in OAMJs were increasing in every jurisdiction (Figure 4).

Stepwise linear regression produced a model (R^2=0.871, F(1,6)=40.56, p<0.001) for the Australian national total with year as a predictor of increased output

Fig. 4: Neuroscience publications in open access mega-journals with (a) Australian or Canadian affiliations and funding or (b) US or UK affiliations.



(β=86.4, p<0.001). However, for papers that acknowledge Australian funders, the regression equation (R^2=0.961, F(1,6)=62.29, p<0.001) included both year (β=10.67, p=0.031) and the Australian policy (β=55.27, p=0.023) as predictors. Regression equations for Canadian national totals (R^2=0.926, F(1,6)=31.08, p=0.002) found the year (β=78, p=0.001) as a positive predictor, but that the implementation of the Canadian policy was negatively associated with Canadian neuroscience OAMJ publications (β=−168.5, p=0.033). For Canadian funder acknowledgements (R^2=0.845, F(1,6)=32.74, p=0.001), the implementation of the Australian policy appeared to be a predictor of more OAMJ publications (β=109.6, p=0.001).

For the US national total, stepwise linear regression produced a significant model (R^2=0.702, F(1,6)=14.17, p=0.009) with year as its only predictor (β=217.1, p=0.009). Similarly, the regression equation for the UK national total (R^2=0.942, F(1,6)=97.19, p<0.001) had year as its only predictor (β=118.7, p<0.004).

4. Discussion

The present study has found no evidence that funder open access policies reduce the rate at which neuroscientists publish in Elsevier journals with non-compliant embargo periods of more than 12 months. Australian output in non-compliant journals grew between 2010 and 2017, with the onset of combined ARC and NHMRC open access policies in 2013 coinciding with an increase in publications in non-compliant journals. Growth in scientific output has resulted in a general increase in scientific publications, with the most pronounced growth in immediate open access journals.

Our data suggests that Australian and Canadian neuroscientists do not generally consider funder open access policy prohibitions on publishing in journals with long embargo periods on self-archiving. The majority of academics do not self-archive their manuscripts even though it can provide benefits at no additional cost to them (Gargouri et al., 2010; Harnad, 2013; Vincent-Lamarre et al., 2015). However, failing to deposit a manuscript is a passive form of non-compliance with funder policies that may arise from uncertainty or lack of time (Charbonneau & McGlone, 2013). In contrast, publishing in a non-compliant journal requires an active decision to submit to a journal without regard to its embargo period whether through ignorance or indifference.

While it is theoretically possible that some authors are compliant with open access mandates either by using an author addendum or by paying hybrid open access fees, authors almost universally sign copyright or license to publish agreements without modification (Charbonneau & McGlone, 2013) and the astronomical cost of publishing open access in hybrid journals usually deters the vast majority of authors (Laakso & Björk, 2016).

Another possibility is that authors publish in journals without regard to embargo periods but self-archive manuscripts in defiance of the publisher's embargo. We briefly examined this possibility by using the open access button to search for self-archived copies of articles that were published in 2017 but were less than 18 months old (Emery, 2018; McArthur, MacGillivray, & Norori, 2013). Of 53 articles published by Australian authors, only 1 article had full text available from an Australian institutional repository, 1 article had full text under embargo, and another 18 had metadata only. Articles were more likely to be available from an international co-author's institutional repository, with 3 articles available by this route. For 80 articles published by Canadian authors, 10 papers were available in either UK or PubMed Central repositories, again presumably deposited by international co-authors. We therefore estimate that the publisher embargo non-compliance rate for Australian and Canadian authors is less than 1%. This is consistent with our own use of Australian and Canadian institutional repositories, which frequently integrate SHERPA/RoMEO advice into their deposit workflows to prevent authors from infringing copyright agreements.

The indifference of authors towards embargo periods suggests that Elsevier and other major subscription publishers have little incentive to lower embargo periods. While Elsevier has reduced journal embargo periods from time to time, this process has been gradual (Gray, 2018) and approximately one third of Elsevier's neuroscience journals in the present study had non-compliant embargo periods. However, growth in Elsevier's compliant subscription journals appears to be slightly better than in their non-compliant range of journals. While non-compliant journals saw little growth in the number of published articles outside of Australia, compliant journals had statistically significant growth in Australia (post-funder policy) and annual growth in Canada and the UK.

The pace of growth in the number of publications for immediate open access journals was higher than growth in subscription journals. Immediate open

access neuroscience journals with the DOAJ Seal experienced growth in Australia (post-funder policy), but the increase in publications acknowledging the ARC and NHMRC was not predicted by policy implementation. Canada and the US also experienced annual growth and the rate of open access publishing in the UK was higher post-2013 than pre-2013. These findings suggest that there is an ongoing cultural shift toward open access in neuroscience, but for the most part it does not appear to be associated with funder policy. This is consistent with previous findings that open access publishing is growing its share of biomedical outputs (Laakso & Björk, 2012). However, it may be due to cultural shifts rather than a direct response to funder open access policies.

There was some equivocal evidence that funder open access policies drove growth in the number of publications in OAMJs. While the Australian policy was a predictor of the number of OAMJ papers that acknowledged Australian funders, it was also a predictor of the number of OAMJ papers that acknowledged Canadian funders. In contrast, the Canadian policy was negatively associated with the number of OAMJ papers with Canadian affiliations. Although the data shows clear evidence for growth in the number of neuroscience OAMJ papers between 2010 and 2017, it is confounded by the almost complete lack of funder acknowledgement data for 2010–2012, suggesting that this data was not collected by Scopus.

A gradual cultural shift towards open access explains the persistence of publishing in non-compliant journals, but greater growth in compliant journals and immediate open access journals. Academics in particular sub-fields may experience a degree of lock-in for particular journals because of their importance in their area. Academic journals serve as scholarly certification communities by filtering and curating papers for particular disciplines through peer review and editorial selection, providing quality indicators that are used by research funders and institutions, and disseminating the research findings of authors (Chang, McAleer, & Oxley, 2011; Lindsey, 1976; Prosser, 2003; Suzuki et al., 2016). Publication in particular journals may therefore confer status and prestige that will create opportunities that are not available by publishing in other outlets, even if they require authors to ignore funder policies. While these constraints may prevent non-compliant journals from losing authors, the benefits of open access and a general cultural drive towards open access supports greater growth in open access journals or funder-compliant subscription journals.

In this context, funder open access policies are important even if they are not necessarily driving obvious effects on author choice of journal. Funder policies may provide a signal that normalises open access publishing, even as authors remain ambivalent about copyright (Dodds, 2018) and sceptical of the gold open access business model that has enabled predatory or deceptive publishing (Beall, 2013; Haspelmath, 2013; Shamseer et al., 2017). However, it is clear that funder policies lack the kind of compliance incentives or enforcement mechanisms required to produce obvious effects. For example, compliance with funder open access policies is not explicitly assessed in funding applications and non-compliance incurs no penalties. Institutions also may not have the infrastructure, licensing arrangements, or processes to educate authors and ensure that articles are deposited in repositories (Houghton, 2010; Schmidt & Shearer, 2012). It seems that incentives are of particular importance because even a waiver of publisher embargo did not increase the self-archiving rate of papers in library and information science (Emery, 2018).

The present study was limited to neuroscience journals published by Elsevier, neuroscience journals with the DOAJ Seal, and neuroscience papers in OAMJs. It did not include new prestigious open access journals backed by respected institutions and societies like eLife and eNeuro and we do not consider journal impact factor or other widely used, albeit flawed, quality measures. Meanwhile, the DOAJ Seal journals included publishers that have controversial backgrounds. Both Frontiers and Hindawi have been controversially included on Beall's list of predatory publishers (Bloudoff-Indelicato, 2015; Butler, 2013) although there may have been subsequent quality improvements (Berger & Cirasella, 2015). An alternative explanation for our findings is therefore that the rise in the number of publications in these journals is not due to funder policy or academic culture in neuroscience shifting towards open access, but is simply due to new major open access publishers becoming established in the field. This possibility is a particularly credible explanation for the growth in OAMJs, which publish articles without consideration to their contribution or novelty (Björk & Catani, 2016). Indeed, commercial publishers freely admit to launching OAMJs in order to raise revenue from articles rejected from their more selective titles (Wakeling et al., 2017), raising the possibility that these articles would not have been published at all if OAMJs did not exist.

5. Conclusions

Funder open access policies that mandate green open access via self-archiving permit authors to publish in the vast majority of journals from major publishers. However, many Australian and Canadian neuroscientists choose to publish in a subset of Elsevier journals that have embargo periods that are incompatible with the open access policies of major national funders. Dedicated immediate open access journals appear to be growing at a faster rate than Elsevier's subscription journals, albeit from a low base. These findings demonstrate that funder open access policies may have limited effects beyond assisting cultural trends toward open access without greater institutional support or practical and financial incentives.

Acknowledgements

The authors are supported by Concordia University Horizon Postdoctoral Fellowships.

Conflict of Interest Declaration

The authors have published with or reviewed for some of the major publishers and their competitors mentioned in this paper as part of their regular academic duties. They have never received any kind of payment for doing so. They declare no other conflict of interest.

References

Ashworth, S., Mccutcheon, V., & Roy, L. (2014). Managing open access: the first year of managing RCUK and Wellcome Trust OA funding at the University of Glasgow Library. *Insights: the UKSG Journal*, *27*, 282–286. https://doi.org/10.1629/2048-7754.175.

Beall, J. (2013). Predatory publishing is just one of the consequences of gold open access. *Learned Publishing*, *26*, 79–84. https://doi.org/10.1087/20130203.

Berger, M., & Cirasella, J. (2015). Beyond Beall's list: Better understanding predatory publishers. *College & Research Libraries News*, *76*, 132–135.

Björk, B.-C. (2017). Gold, green, and black open access. *Learned Publishing*, *30*, 173–175. https://doi.org/10.1002/leap.1096.

Björk, B.-C., & Catani, P. (2016). Peer review in megajournals compared with traditional scholarly journals: Does it make a difference? *Learned Publishing*, *29*, 9–12. https://doi.org/10.1002/leap.1007.

Björk, B.-C., & Solomon, D. (2012). Open access versus subscription journals: a comparison of scientific impact. *BMC Medicine*, *10*, 73. https://doi.org/10.1186/1741-7015-10-73.

Bloudoff-Indelicato, M. (2015). Backlash after Frontiers journals added to list of questionable publishers. *Nature*, *526*, 613. https://doi.org/10.1038/526613f.

Bohannon, J. (2016). Who's downloading pirated papers? Everyone. *Science*, *352*, 508–512. https://doi.org/10.1126/science.352.6285.508.

Butler, D. (2013). Investigating journals: The dark side of publishing. *Nature*, *495*, 433–435. https://doi.org/10.1038/495433a.

Chang, C.-L., McAleer, M., & Oxley, L. (2011). How are journal impact, prestige and article influence related? An application to neuroscience. *Journal of Applied Statistics*, *38*, 2563–2573. https://doi.org/10.1080/02664763.2011.559212.

Charbonneau, D. H., & McGlone, J. (2013). Faculty experiences with the National Institutes of Health (NIH) public access policy, compliance issues, and copyright practices. *Journal of the Medical Library Association*, *101*, 21–25. https://doi.org/10.3163/1536-5050.101.1.004.

Dodds, F. (2018). The changing copyright landscape in academic publishing. *Learned Publishing*, *31*, 270–275. https://doi.org/10.1002/leap.1157.

Emery, J. (2018). How green is our valley?: five-year study of selected LIS journals from Taylor & Francis for green deposit of articles. *Insights: The UKSG Journal*, *31*(23), 1–9. https://doi.org/10.1629/uksg.406.

European Commission. (2018). The EU framework programme for research and innovation: Horizon 2020. Retrieved from https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf.

Gargouri, Y., Hajjem, C., Larivière, V., Gingras, Y., Carr, L., Brody, T., & Harnad, S. (2010). Self-selected or mandated, open access increases citation impact for higher quality research. *PLoS One*, *5*, e13636. https://doi.org/10.1371/journal.pone.0013636.

Gray, A. (2018). *Elsevier embargo periods, 2013–2018* [Fileset], Figshare. https://doi.org/10.6084/m9.figshare.1554748.

Green, T. (2017). We've failed: Pirate black open access is trumping green and gold and we must change our approach. *Learned Publishing 30*, 325–329. https://doi.org/10.1002/leap.1116.

Harnad, S. (2013). Worldwide open access: UK leadership? *Insights: The UKSG Journal*, *26*, 14–21. https://doi.org/10.1629/2048-7754.26.1.14.

Harnad, S., Brody, T., Valliéres, F., Carr, L., Hitchcock, S., Gingras, Y., … Hilf, E.R. (2004). The access/impact problem and the green and gold roads to open access. *Serials Review*, *30*, 310–314. https://doi.org/10.1080/00987913.2004.10764930.

Harnad, S., Brody, T., Vallières, F., Carr, L., Hitchcock, S., Gingras, Y., … Hilf, E.R. (2008). The access/impact problem and the green and gold roads to open access: An update. *Serials Review*, *34*, 36–40. https://doi.org/10.1080/00987913.2008.10765150.

Haspelmath, M. (2013). Why open-access publication should be nonprofit – a view from the field of theoretical language science. *Frontiers in Behavioral Neuroscience*, *7*, 1–2. https://doi.org/10.3389/fnbeh.2013.00057.

Higher Education Funding Council for England. (2016). Policy for open access in Research Excellence Framework 2021. Retrieved from http://www.hefce.ac.uk/pubs/year/2016/201635/.

Houghton, J.W. (2010). Economic implications of alternative publishing models: Self-archiving and repositories. *LIBER Quarterly*, *19*, 275–292. https://doi.org/10.18352/lq.7966.

JASP Team. (2018). JASP (Version 0.9.0.1). Retrieved from https://jasp-stats.org/.

Khoo, S.Y.-S., & Lay, B.P.P. (2018). Journal choices of Australian and Canadian neuroscientists by self-archiving embargo. *Figshare*. https://doi.org/10.6084/m9.figshare.7045370.

Laakso, M., & Björk, B.-C. (2012). Anatomy of open access publishing: a study of longitudinal development and internal structure. *BMC Medicine*, *10*, 124. https://doi.org/10.1186/1741-7015-10-124.

Laakso, M., & Björk, B.-C. (2016). Hybrid open access – A longitudinal study. *Journal of Informetrics*, *10*(4), 919–932. https://doi.org/10.1016/j.joi.2016.08.002.

Lindsey, D. (1976). Distinction, achievement, and editorial board membership. *American Psychologist*, *31*, 799–804. https://doi.org/10.1037/0003-066X.31.11.799.

McArthur, J., MacGillivray, M., & Norori, N. (2013). Open access button. Retrieved from https://openaccessbutton.org/.

Moher, D., Glasziou, P., Chalmers, I., Nasser, M., Bossuyt, P.M.M., Korevaar, D.A., … Boutron, I. (2016). Increasing value and reducing waste in biomedical research: who's listening? *The Lancet*, *387*, 1573–1586. https://doi.org/10.1016/S0140-6736(15)00307-4.

Nature. (2018). Publishing licenses and compliance with open access mandates. Retrieved from https://www.nature.com/authors/policies/license.html.

Nicholas, D., Rodríguez-Bravo, B., Watkinson, A., Boukacem-Zeghmouri, C., Herman, E., Xu, J., … Świgoń, M. (2017). Early career researchers and their publishing and authorship practices. *Learned Publishing*, *30*, 205–217. https://doi.org/10.1002/leap.1102.

Prosser, D.C. (2003). The next information revolution – How open access repositories and journals will transform scholarly communications. *LIBER Quarterly*, *14*, 23–36. https://doi.org/10.18352/lq.7755.

Prosser, D.C. (2007). Public policy and the politics of open access. *LIBER Quarterly*, *17*(2), n.p. https://doi.org/10.18352/lq.7877.

SAGE Publishing. (2018). Guidelines for SAGE authors. Retrieved from https://us.sagepub.com/en-us/nam/journal-author-archiving-policies-and-re-use.

Schmidt, B., & Shearer, K. (2012). Licensing revisited: Open access clauses in practice. *LIBER Quarterly*, *22*, 176–189. https://doi.org/10.18352/lq.8055.

Shamseer, L., Moher, D., Maduekwe, O., Turner, L., Barbour, V., Burch, R., … Shea, B. J. (2017). Potential predatory and legitimate biomedical journals: can you tell the difference? A cross-sectional comparison. *BMC Medicine*, *15*, 28. https://doi.org/10.1186/s12916-017-0785-9.

Springer. (2018). Self-archiving policy. Retrieved from https://www.springer.com/gp/open-access/authors-rights/self-archiving-policy/2124.

Steele, C. (2013). Open access in Australia: an odyssey of sorts? *Insights: The UKSG Journal*, *26*, 282–289. https://doi.org/10.1629/2048-7754.91.

Suber, P. (2008). An open access mandate for the National Institutes of Health. *Open Medicine*, *2*, e39–e41.

Suber, P. (2012). Ensuring open access for publicly funded research. *BMJ: British Medical Journal*, *345*, e5184, 1–4. https://doi.org/10.1136/bmj.e5184.

Suzuki, K., Edelson, A., Iversen, L.L., Hausmann, L., Schulz, J.B., & Turner, A.J. (2016). A learned society's perspective on publishing. *Journal of Neurochemistry*, *139*, 17–23. https://doi.org/10.1111/jnc.13674.

Vincent-Lamarre, P., Boivin, J., Gargouri, Y., Larivière, V., & Harnad, S. (2015). Estimating open access mandate effectiveness: The MELIBEA score. *Journal of the Association for Information Science and Technology*, *67*, 2815–2828. https://doi.org/10.1002/asi.23601.

Wakeling, S., Spezi, V., Fry, J., Creaser, C., Pinfield, S., & Willett, P. (2017). Open access megajournals: The publisher perspective (Part 1: Motivations). *Learned Publishing*, *30*, 301–311. https://doi.org/10.1002/leap.1117.

Wiley. (2018). Wiley's self-archiving policy. Retrieved from https://authorservices.wiley.com/author-resources/Journal-Authors/licensing/self-archiving.html.

Xia, J., Gilchrist, S.B., Smith, N.X.P., Kingery, J.A., Radecki, J.R., Wilhelm, M.L., … Mahn, A.J. (2012). A review of open access self-archiving mandate policies *portal: Libraries and the Academy*, *12*, 85–102. https://doi.org/10.1353/pla.2012.0000.

Zhu, Y. (2017). Who support open access publishing? Gender, discipline, seniority and other factors associated with academics' OA practice. *Scientometrics*, *111*, 557–579. https://doi.org/10.1007/s11192-017-2316-z.