Authors from the periphery countries choose open access more often

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Abstract
This article analyses attitudes of academic authors toward open access (OA) and the frequency of choosing OA publication venues. The research looks particularly at differences between authors based in countries with a gross domestic product per capita less or greater than US$18,000 (called periphery and core countries, respectively). The data were obtained with an online survey sent to 107,296 scholars listed on the mailing lists belonging to De Gruyter Open from December 2015 to January 2016. A total of 1,012 responses were received. Authors from the periphery countries publish their articles in gold OA more often and they also pay OA publication fees equally often as those based in the core countries. The reasons for that are complex, involving both their preference to publish in OA and the composition of the publishing market in the periphery.

INTRODUCTION

Academic research might be seen as a centralized environment with a very clearly distinguished and geographically separated core and a periphery. Eugene Garfield, the impact factor’s inventor, claimed in 1983 that “Western journals control the flow of international scientific communication almost as much as Western news agencies monopolize international news” (Garfield, 1983, following Guédon, 2008). More recently Jean-Claude Guédon discussed the existence of arbitrary formulated ‘mainstream’ of academic research. He claimed that in an ‘international competition’ every scholar in the world is judged on the basis of his/her contribution to the ‘mainstream’ (Guédon, 2008). In the same article, Guédon applied a global ‘core–periphery’ division to an analysis of academic research environment, arguing that contributing to the ‘mainstream’ is more difficult for those from outside of the core countries. He suggested that open access (OA) journals can be expected to cross the division between researchers working in centre and their colleagues in the periphery by bringing more visibility to works of the latter. This article aims to shed more light on the problem of actual publishing behaviours of authors from both the core and the peripheral countries.

The ‘core–periphery’ division originates from the dependency theory and has been developed by the world system theory. Both of these theories indicate that the global core is specialized in capital-intensive, highly monopolized production, which is profitable, whereas the global periphery produces mostly labour-intensive goods that are sold in competitive markets, which limits their potential profits (Schortman & Urban, 1992).

Analysing academic research from the perspective of world system seems to be a promising approach. Research institutions need skilled labour, which is expensive to train and requires costly equipment, especially in Life and Physical Sciences (the Large Hadron Collider being an example of an ultra-expensive research facility). Academic research is concentrated in the same places of the world as highly profitable, monopolized production. According to the World Bank Data on scientific and technical journal articles (http://data.worldbank.org/indicator/IP.JRN.ARTC.SC), a country’s publishing output per million people correlates very strongly with gross domestic product (GDP) per capita (Spearman coefficient of 0.84!). Gini coefficient for publishing output per capita is higher than for GDP, thus the contribution to the scientific ‘mainstream’ is even more unequally distributed among countries than GDP. What is more, control on the rules of the
production and distribution of academic knowledge is highly concentrated in the west.

In this article, I analyse attitudes of academic authors toward OA and the frequency of choosing OA publication venues, and what influence geographical location has on these attitudes and choices. Specifically, my goal is to characterize differences between authors based on the periphery countries and the core countries, with regard to choosing so-called gold OA as a way of publishing academic articles. The article is based on data from De Gruyter Open Author Research. Part of the results presented here was previously discussed on the blog belonging to the company (OpenScience.com, 2016; http://openscience.com/what-do-academic-authors-think-of-open-access-de-gruyter-open-author-survey/). The data from the research are openly available (Figshare, 2016; https://figshare.com/articles/Key_Challenges_of_Research_Communication_-_De_Gruyter_Open_Author_s_Survey_2016/3425738). For the purpose of this research, gold OA work is defined as an academic publication made publicly available on a publisher’s website without embargo. Gold OA is therefore organized by publishers, in contrast to so-called green OA, which is usually maintained by academia. The total share of gold OA articles in Scopus, the most comprehensive database of published academic articles, was calculated to be 16.2% in 2011, growing by 1% point annually (Laakso & Björk, 2012).

Defining the core and the periphery of the world is an interesting and non-trivial research goal in itself; however, since it is not a central aim of this article, I decided to use one simple indicator to identify core and peripheral areas. GDP per capita has already been used as such an indicator. This approach is described as an income tradition by Babones, who pointed out that ‘World-systems sociologists generally agree that all states contain some mix of core and peripheral type activities within their borders. If it is the case that core type activities are vastly more remunerative than peripheral type activities, it should be possible to use gross national product (GNP) per capita as a proxy for the level of core activity in the productive mix of an economy’ (Babones, 2015).

Based on the World Bank data, I assumed that periphery countries are those with current GDP per capita less than or equal to US$18,000 in 2015, whereas core countries are those with GDP above this (http://data.worldbank.org/indicator/NY.GDP.PCAP.CD). Resulting division of the world is quite similar to that obtained by world-system researchers including Babones (2015).

Other types of division of countries into core and periphery might also be applied with similar results. The line of US$18,000 might be seen as arbitrary, but it is simple and easy to reproduce. It results in a list of core countries similar to other divisions of this kind. It is also similar to the existing list of ‘Advanced economics’, used by International Monetary Fund (http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/weoselagr.aspx#a110). However, for obvious reasons, differences between all possible lists of ‘advanced’ or core countries are small.

METHOD

The data on authors’ attitudes and experiences with OA were obtained through an online survey. The survey questionnaire is still available online (http://survey2015.degruyteropen.com/).

E-mails containing links to the survey were sent to 107,296 scholars included in the mailing lists (composed of authors, readers, and reviewers, mostly active academic researchers) belonging to De Gruyter Open, from December 2015 to January 2016. A total of 1,012 responses were received, with a response rate of 0.94%.

The fact that 99.06% of e-mailed researchers did not answer the survey suggests that those who answered probably have some extraordinary features. Most likely, they evince interest in the subject of the research (research communication) or sympathy towards De Gruyter Open’s brand. They should not be seen as a statistical representation of all researchers in the world.

Yet, to the best of my knowledge, there is no truly representative study on this problem to date, and the above disclaimer should also be applied to other studies of this kind. Response bias has resulted in over-representation of authors who publish OA works. I was trying to diminish this effect at the stage of research design by avoiding the phrase ‘OA’ in the invitation to take part in the research and in the introduction to the survey, but despite this, over-representation of OA published authors seems to be quite significant: 35.8% of articles published by our respondents in the years 2012–2015 were in gold OA journals.

RESULTS

Out of 1,012 respondents of De Gruyter Open Author Survey, 91 claimed to have no publishing output in the last 3 years, and 23 failed to provide valid answers about their recent publications. A total of 898 respondents were classified as academic authors.
Researchers from these groups were asked questions about general opinions on OA and rights to reuse that they would like to grant to their readers. Other respondents were excluded. Thus, for these general questions \( N = 898 \). Of these authors, 53 published books or book chapters only. The analysed sample contains 844 authors of academic articles. The share of gold OA articles was calculated for this group only. Questions about factors for choosing a journal in which to publish their paper were also asked of this group only.

Academic authors were analytically divided into two categories. Those living in countries where GDP per capita was less than or equal to US$18,000 according to World Bank data, and those from countries where this amount was higher (The World Bank, 2016). A total of 364 authors work in the core countries, which is 40.5% of the sample. About 519, that is 57.7%, are based in the periphery, whereas the remaining 15 live in countries for which there were no data about GDP. Observations with missing data on GDP were counted in the general analysis, but they were excluded from the comparison of the core and the periphery. A total of 90.3% of researched academic authors are based in Europe (in which Russia and Turkey are included). When it comes to article authors, 486 of them are based in the periphery and 345 in the core (Tables 1 and 2).

A total of 82.5% of article authors from the periphery countries have at least one gold OA paper in their portfolio, which is true only for 63.7% of their colleagues based in the core countries.

### TABLE 1

| Country       | Authors |
|---------------|---------|
| Belarus       | 9       |
| Brazil        | 7       |
| Bulgaria      | 80      |
| Croatia       | 129     |
| Estonia       | 43      |
| Hungary       | 11      |
| India         | 1       |
| Latvia        | 29      |
| Mexico        | 1       |
| Moldova       | 1       |
| Poland        | 2       |
| Romania       | 1       |
| Russia        | 45      |
| Serbia        | 75      |
| Slovakia      | 1       |
| South Africa  | 41      |
| Turkey        | 4       |
| Ukraine       | 39      |
| **Total**     | **519** |

## TABLE 2

**Academic authors based in countries categorized as the core.**

| Country       | Authors |
|---------------|---------|
| Australia     | 1       |
| Austria       | 2       |
| Denmark       | 97      |
| Finland       | 2       |
| France        | 6       |
| Germany       | 15      |
| Greece        | 122     |
| Italy         | 32      |
| Ireland       | 2       |
| Japan         | 7       |
| Netherlands   | 1       |
| New Zealand   | 2       |
| Norway        | 1       |
| Portugal      | 21      |
| Slovenia      | 1       |
| Spain         | 24      |
| Sweden        | 5       |
| Switzerland   | 1       |
| UK            | 10      |
| USA           | 12      |
| **Total**     | **364** |
papers in a researcher’s portfolio results from her/his choices that employ many more factors than openness. To understand why publishing in gold OA is more popular among researchers from less wealthy countries, it is essential to analyse how authors make decisions about where to submit their work to.

According to respondents, the most important factors for choosing a journal in which to publish are: abstracting and indexing services that cover a journal, impact factor, chances for getting work published, and quality of peer review (Fig. 3). For authors from the periphery countries, impact factor and abstracting and indexing services are even more important than to their colleagues from the global centre. (In both cases, the median was 9 for the periphery and 8 for the core, on a 1–10 scale of importance.) Open access has the lowest median of importance out of nine analysed factors for choosing a journal. Yet, 10.4% of authors labelled OA as ‘10 = extremely important’ factor to them. About 58.3% of authors rate it 6 or more on a 1–10 scale, thus to be precise, I would say that OA is important to researchers, but apparently there are more important factors. Furthermore, OA is more important to authors from the global periphery (median 7 for them and 6 for those from the core). Authors with more OA journals in their portfolio tend to treat OA as a more important factor of choosing a journal than others, however, this effect is moderate (Spearman correlation of 0.35 for the whole sample and 0.29 for peripheral countries).

The majority of surveyed academic authors shared positive opinions about OA. However, opinions on OA do not correlate with the actual share of gold OA articles in a researcher’s portfolio, neither in the core countries nor in the periphery. A total of 87.5% agree or strongly agree that ‘OA may have a positive influence on the chances of being cited’. Only a slightly smaller fraction believes that ‘the general public should have access to research’, 83.3% of surveyed researchers agree or strongly agree that ‘OA makes it easier to promote an academic work’. Authors from the global periphery are even more likely to accept both the promotional advantage and the citation advantage of OA (in both cases the median is ‘Strongly agree’ for authors from the periphery and ‘Agree’ for those from the core). More authors from the periphery countries also feel that they are under pressure from colleagues or supervisors to publish in OA (median for the researchers from the core countries is ‘Disagree’, while for researchers from the periphery the median is in the centre of the scale – ‘Neither agree nor disagree’). Yet only perceived pressure

TABLE 3  Respondent categorization.

|                              | Students | Early career | Established |
|------------------------------|----------|--------------|-------------|
| Median of share of gold open |          |              |             |
| access works in papers       | 50%      | 3.5%         | 22%         |
| published                    |          |              |             |
| Core countries               | 50%      | 3.5%         | 22%         |
| Periphery countries          | 50%      | 55%          | 36.3%       |

FIGURE 1  Authors who published at least one work of a given type in recent 3 years, in percentages of all academic authors in the core.

FIGURE 2  Authors who published at least one work of a given type in recent 3 years, in percentages of all academic authors in the periphery.

FIGURE 3  How important to you are the following factors in choosing a journal to publish your work in? Note: 1 = not important at all; 10 = extremely important.
from supervisors and colleagues seems to correlate with the real frequency of choosing OA. And this correlation is quite weak and even weaker for the periphery. (The Spearman correlation is 0.29 for all respondents, 0.3 for researchers from the core countries, and 0.25 for researchers from the periphery.)

Perceived citation advantage and promotional advantage of OA seems to correlate only moderately with importance of OA as a factor for choosing a journal to publish work in and is not directly linked to actual publishing behaviours.

Respondents were asked in the survey if they agree to grant their readers the right to translate their work, include it in an anthology, mine by software in search for text and data or republish with a commercial company. Surprisingly, the majority of respondents refused to grant any of these rights to their readers. Yet authors from the global periphery are more likely to accept readers’ rights to reuse, which is granted by liberal licensing that dominates OA publishing.

Lack of acceptance of reusage rights is surprising (Table 4), because all of these rights are granted to readers, without additional approval, on the basis of Creative Commons Attribution License, which is the most popular license among journals indexed by Directory of Open Access Journals (DOAJ, https://doaj.org/). Therefore, majority of OA authors should feel comfortable with it – but apparently they do not. Yet authors from the global periphery are more likely to accept conditions of liberal licensing.

Authors from the periphery countries seem to exhibit generally more positive attitudes towards OA publishing than their colleagues from more wealthy regions. However, differences in beliefs does not explain the huge difference in share of gold OA works in all works published by respondents from the periphery and the core. The main factors that shape publishing behaviours of all authors are well established, arbitrary criteria of quality, such as impact factor and abstracting and indexing services. Researchers try to balance them with chances of getting a particular work published in a given venue. The most possible explanation of the observed difference in publishing output is that, for various reasons, researchers from the periphery countries tend to publish in their ‘local’ journals, which are OA for supply-side reasons. This hypothetical explanation will be expanded in the ‘Discussion’ section.

Article processing charges

The majority of journals indexed in DOAJ do not charge authors for publication, although this funding model has been popularized by very successful journals operating mostly in biomedical sciences, such as PLoS ONE. A fee that is paid by an author or her/his funders to cover publication costs of an OA article is called article processing charge (APC). In all 21.2% of article authors from the periphery countries paid one or more APC in a given period. This is true for 18% of their colleagues from the core countries. This raises the question of how authors from less wealthy countries are able to find the money to pay publication fees. Respondents reported that they rely more on their own pockets than being able to obtain institutional or grant funds, which also makes paying APCs more problematic for them.

In all 61% of researchers from the periphery who paid an APC claimed that it was quite difficult or very difficult for them to organize money for this goal. The same is true for only 43.8% of authors from the core.

Researchers were also asked if they expect to have access to any funds, their own or external ones, that might be spent on funding OA publication fees. Authors working in the periphery countries are less likely to expect access to money from grants intended to be spent on publication costs (10.4% vs. 15.9%), and they are equally likely to predict that they will have grant money that might be spent on unspecified goal (10.4% vs. 11.3%). Yet 12.3% of authors from the peripheral countries are ready to treat their own money as a resource that may cover publication fees, which is true for only 5.7% of those based in the core countries. Supplementing funding with their own money lets authors from less wealthy regions pay OA charges as often as their richer colleagues do.

However, balancing the lack of resources (and the fact of being based in a country with a lower GDP), it appears that the APCs paid by authors in the periphery countries are also lower than their counterparts in the core countries. The median of the most recent APCs paid by authors from the core is €1,100, whereas those from the less wealthy countries paid only €300. This may also demonstrate that researchers from the periphery target different journals than their colleagues from more wealthy countries.

DISCUSSION

Composition of what is considered as the ‘mainstream’ publication channels in global research is maintained by two privately held entities. The major one is Thomson Reuters (now Clarivate Analytics), based in USA, that publishes Web of Science and calculates impact factor. The second one is RELX Group operating

| Do you agree to grant your readers the right to | Researchers based in the periphery countries | Researchers based in the core countries |
|-----------------------------------------------|----------------------------------------------|----------------------------------------|
| Translate your work without your approval     | 35.1%                                        | 18.1%                                  |
| Include your work in the text anthology without your approval | 37.6%                                        | 17.2%                                  |
| Extract data from the text of your work by automatic software without your approval | 36.0%                                        | 23.4%                                  |
| Republish your work with a commercial company without your approval | 8.9%                                         | 3.6%                                   |

TABLE 4 Percentages of authors willing to allow reuse rights to readers.
from London, which owns Scopus. However, the dominance of
western-based private companies in the field of academic
research is happening not only in defining what is and what is not
the ‘mainstream’. In 2013, half of the mainstream academic
research (as defined by articles indexed by Web of Science) was
published by the five biggest publishers, all being commercial
enterprises based in Western Europe and USA (Larivière, Haus-
tein, & Mongeon, 2015). Western-based commercial companies
have accumulated real control over the academic system, creating
a quasi-monopolized market.

Interestingly, the oldest among influential university rankings,
The Academic Ranking of World Universities, was started in the
global periphery. The ranking was published for the first time in
2003 by Shanghai Jiao Tong University, with the objective to
‘assess the gap between Chinese universities and world-class uni-
versities’ (Liu & Cheng, 2005). Among others it uses Scopus data to
assess global research institutions. As a result, in 2015, the top
100 of resulting ranking includes 51 universities from USA and nine
from the UK. Only three universities from the ranking’s top 100
and only 70 universities from the top 500 are based in the
periphery.

The existence of the Shanghai ranking and its western-orien-
tated methodology is a proof that control over the rules of
academic competition has been accumulated in the west to an
extent that their arbitrariness has been forgotten by everyone. Fac-
tors that fostered this accumulation are various. However, all are
connected to economic dominance. Research institutions need
highly skilled labour, and access to knowledge and the equipment
needed to conduct a cutting edge research is also capital-intensive.

Economic dominance of the USA after the Second World War
triggered cultural changes that support this dominance. One result
was the collapse of German and French as international languages,
and this resulted in a limitation of the number of people from
peripheral countries being able to communicate in their native
languages. Dominance of the English language supported the emer-
gence of one international publishing market and its size encour-
aged commercial enterprises to enter academic publishing industry
in search for profit. These enterprises quickly accumulated signifi-
cant capital and have created an oligopoly that has seen inflated
prices for journal subscriptions and made access to knowledge even
more expensive (see also Guédon, 2008). Thus, an economic and
cultural dominance has reinforced itself over time.

Existence of international lists of ‘mainstream’ journals cre-
ates pressure on all researchers in the world to publish in these
journals. Yet, while for authors from the core countries the result-
ing situation is natural, it may create some dilemmas for those based
in the periphery. Researches have suggested, for instance,
that Chinese medical doctors still want to publish in journals that
are published locally in their own language in order to reach their
peers from the local community (Li, 2014), however, researchers
are required to read and publish in international journals. There-
fore, a pressure to publish in Western journals only may make
their career advancement more difficult.

Submitting works to journals based in the core countries
might be also more difficult to researchers from the periphery.

One of the reasons might be that writing habits and conventions
coming from their native languages might be treated by English
native speakers as an evidence of their discursive incompetence
(Canagarajah, 1996).

For authors from the global periphery present in the analysed
sample, OA is the least important factor of choosing a journal to
publish work in, while journal impact factor and abstracting ser-
vices are the most important. These two factors favour ‘main-
stream’ journals that are usually published in the core countries.
However, if all factors are taken together there are forces that
will lead peripheral authors to publish in their local journals, and
for many of them OA venues appear to be the best option. This
may also be because OA journals are simply more popular among
peripheral researchers.

Indeed, the regional composition of journals indexed by
DOAJ is quite surprising (Doaj.org, 2016). Among 9,160 journals
indexed in DOAJ the biggest group comes from Brazil (9.6% of
all). About 51.6% of all journals indexed by DOAJ are based in
countries with GDP per capita less than or equal to US$18,000 in
2015 whereas only 43.2% come from regions with higher GDP
(the others are from countries with no known GDP for 2015).

To understand the reasons that trigger the popularity of OA
among journals based in the periphery, it is worth taking a closer
look at the world’s leader in number of journals indexed by
DOAJ. In Brazil, and to lesser extent in other Latin American
countries, the main factor behind the growth in OA journals has
been SciELO. SciELO is an OA publishing platform and indexing
service. It was started in the late 1990s as one of the world’s first
OA publishing initiatives. SciELO has been launched as a coopera-
tion of two non-governmental organizations, but as early as 2002
it received support from the Brazilian governmental agency,
CNPq, which was subsequently joined by other governmental
bodies from various Latin American countries. In 2013, SciELO
was indexing 1,000 journal titles that publish more than 40,000
articles per year (Packer, Cop, Luccisano, Ramalho, & Spinak,
2014). As a result, no other region in the world has this level of
adoption of OA journals indexed internationally (Miguel,
Chinchilla-Rodriguez, & de Moya-Anegón, 2011, following Packer
et al., 2014). From the very beginning, SciELO was conceived as a
project to overcome very weak presence of Latin American jour-
nals in the international indexes.

Another example of a peripheral country that has a strong
position in DOAJ is Poland, from where 4.2% of all indexed jour-
nals come from. Polish publishers were able to introduce almost
half as many journals as the much larger Brazil. According to
report, ‘Open Science in Poland 2014. A Diagnosis’, 49.2% of aca-
demic journals published in Poland are open access. This is
because the Polish journal market relies mostly on direct public
subsidies, which are a more important source of funding for the
majority of journals than subscriptions or publication fees. The
main factor that opened Polish journals was a governmental pro-
gramme that offered additional subsidies to OA journals only.
This has resulted in opening both new and well established Polish
journals. The OA journals are well represented among the best
titles published in Poland. Therefore, opening research
communication in Poland might be seen as a political decision on a governmental level, which was easy to execute in a publishing environment that has been dependent on direct public subventions (Leśniak et al., 2015).

The examples of Brazil and Poland suggest that in the periphery journals are opening thanks to public engagement in academic publishing. This might be seen as a conscious political strategy, aimed at diminishing the handicap of local journals on the competitive global market. However, this strategy is unlikely to take place in the global core countries, where the most important journals are privately held, and do not rely on direct public subsidies (while their customers are mostly public institutions). In the periphery, where commercial publishers are less developed due to limited profits available, the majority of journals are owned by academic societies and universities and are run as non-profit initiatives, often relying on public money.

In this context, it is interesting that authors from the periphery in the analysed sample pay APCs at least as often as those from the core countries. It suggests that even if public engagement is a main force behind the shift towards OA in the periphery, it does not exclude the possibility of development of the APC market there. However, the so-called author-pays model is not the most popular neither for works published in the periphery, nor in the core countries.

Some additional analysis of local publishing markets in both peripheral and core countries should be conducted to check if they meet the pattern presented above. However, this exceeds the goals of this article.

CONCLUSION

Authors from the periphery countries publish their articles in gold OA more often. The reasons for this fact are complex, involving both their higher preference to publish in OA and the composition of publishing market in the periphery. The majority of OA serials indexed by the DOAJ are based in the periphery countries. In Poland and Brazil, two periphery countries with high number of OA journals, public involvement is a major force behind the shift of publishing to OA. Whether it is true for other peripheral countries is yet to be confirmed. Questions about goals and effects of public strategies supporting OA might be asked in future studies.

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REFERENCES

Babones, S. (2015). The country-level income structure of the world-economy. Journal of World-Systems Research, 11(1), 29–55. doi:10.5195/jwsr.2005.392

Canagarajah, A. S. (1996). "Nondiscursive" requirements in academic publishing, material resources of periphery scholars, and the politics of knowledge production. Written Communication, 13(4), 435–472. doi:10.1177/0741088396013004001

Doaj.org. (2016). Directory of Open Access Journals. Retrieved from https://doaj.org/search#V6t3GT_sQ1g

Figshare. (2016). Key challenges of research communication—De Gruyter Open Author’s Survey 2016. Retrieved from https://figshare.com/articles/Key_Challenges_of_Research_Communication_-_De_Gruyter_Open_Author_s_Survey_2016/3425738

Garfield, E. (1983). Mapping science in the Third World. Science and Public Policy, 10(3), 112–127. doi:10.1093/spp/10.3.112

Guédon, J. C. (2008). Open access and the divide between “mainstream” and “peripheral” science. Retrieved from http://eprints.rclis.org/10778/

Laakso, M., & Björk, B. C. (2012). Anatomy of open access publishing: A study of longitudinal development and internal structure. BMC Medicine, 10(1), 1. doi:10.1186/1741-7015-10-124

Larivière, V., Haustein, S., & Mongeon, P. (2015). The oligopoly of academic publishers in the digital era. PLoS ONE, 10(6), e0127502. doi:10.1371/journal.pone.0127502

Leśniak, A., Morys-Twarowski, M., Siewicz, K., Starczewski, M., Stepnińska-Ustasiak, L., & Szprot, J. (2015). Open science in Poland 2014: A diagnosis. Warsaw, Poland: Wydawnictwa ICM. ISBN:978-83-63490-10-2

Li, Y. (2014). Chinese medical doctors negotiating the pressure of the publication requirement. Iberica: Revista de la Asociación Europea de Lenguas para fines específicos (AELFE), 28, 107–128.

Liu, N. C., & Cheng, Y. (2005). The academic ranking of world universities. Higher Education in Europe, 30(2), 127–136. doi:10.1080/03797720500260116

Miguel, S., Chinchilla-Rodriguez, Z., & de Moya-Anegón, F. (2011). Open access and Scopus: A new approach to scientific visibility from the standpoint of access. Journal of the American Society for Information Science and Technology, 62(6), 1130–1145. doi:10.1002/asi.21532

OpenScience.com. (2016). What do academic authors think of open access—De Gruyter Open Author Survey, Warsaw, Poland: De Gruyter Open. Retrieved from http://openscience.com/what-do-academic-authors-think-of-open-access-de-gruyter-open-author-survey/

Packer, A. L., Cop, N., Luccisano, A., Ramalho, A., & Spinak, E. (2014). Scielo—15 years of open access: An analytic study of open access and scholarly communication. Paris, France: UNESCO.

Schortman, E. M., & Urban, P. A. (1992). Resources, power, and interregional interaction. New York, NY: Plenum Press.

The World Bank. (2016). GDP per capita (current US$). Retrieved from http://data.worldbank.org/indicator/NY.GDP.PCAP.CD