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Institutional Repositories and Academic Social Networks: Competition or Complement? A Study of Open Access Policy Compliance vs. ResearchGate Participation

Julia A. Lovett

University of Rhode Island, jalovett@uri.edu

Andrée J. Rathemacher

University of Rhode Island, andree@uri.edu

See next page for additional authors

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Authors

Julia A. Lovett, Andrée J. Rathemacher, Divana Boukari, and Corey Lang



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RESEARCH

Institutional Repositories and Academic Social Networks: Competition or Complement? A Study of Open Access Policy Compliance vs. ResearchGate Participation

Julia A. Lovett

Assistant Professor, University Libraries, The University of Rhode Island

Andrée J. Rathemacher

Professor, University Libraries, The University of Rhode Island

Divana Boukari

Master's Candidate, Department of Computer Science and Statistics, The University of Rhode Island

Corey Lang

Associate Professor, Department of Environmental and Natural Resource Economics, The University of Rhode Island

INTRODUCTION The popularity of academic social networks like ResearchGate and Academia.edu indicates that scholars want to share their work, yet for universities with open access (OA) policies, these sites may be competing with institutional repositories (IRs) for content. This article seeks to reveal researcher practices, attitudes, and motivations around uploading their work to ResearchGate and complying with an institutional OA Policy through a study of faculty at the University of Rhode Island (URI). **METHODS** We conducted a population study to examine the participation by 558 full-time URI faculty members in the OA Policy and ResearchGate followed by a survey of 728 full-time URI faculty members about their participation in the two services. **DISCUSSION** The majority of URI faculty do not participate in the OA Policy or use ResearchGate. Authors' primary motivations for participation are sharing their work more broadly and increasing its visibility and impact. Faculty who participate in ResearchGate are more likely to participate in the OA Policy, and vice versa. The fact that the OA Policy targets the author manuscript and not the final published article constitutes a significant barrier to participation. **CONCLUSION** Librarians should not view academic social networks as a threat to open access. Authors' strong preference for sharing the final, published version of their articles provides support for calls to hasten the transition to a Gold OA publishing system. Misunderstandings about the OA Policy and copyright indicate a need for librarians to conduct greater education and outreach to authors about options for legally sharing articles.

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Correspondence: Andrée Rathemacher, 269 Library, University Libraries, University of Rhode Island, Kingston, RI 02881, USA, andree@uri.edu



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IMPLICATIONS FOR PRACTICE

1. Contrary to expectations, we found that faculty who participate in ResearchGate are more likely to share their articles via the open access (OA) Policy than faculty who do not participate in ResearchGate, and vice versa. While a slightly greater percentage of faculty have shared articles through ResearchGate than through the OA Policy, only a minority of faculty are participating in either ResearchGate, the OA Policy, or both. This suggests librarians should not be overly concerned about academic social networking sites competing with OA policies; if anything, faculty who participate in academic social networking sites may be more likely to share their work in general.
2. Throughout the survey, faculty reported a strong aversion to sharing the author manuscript version of their articles. This was the most significant barrier to participating in the OA Policy. This finding, if generalizable, should inform current discussions among OA advocates about the respective roles going forward of Green OA achieved through depositing author manuscripts in institutional repositories and Gold OA achieved at the point of publication.
3. Our survey revealed a range of misunderstandings about the IR, OA policies, and copyright. For example, many respondents believe that the legality of posting one's articles in both the IR and ResearchGate depends on publisher policy and the version of the article posted. In fact, permissions-based OA policies make it legal to post author manuscripts in the IR regardless of publisher policies, and many subscription-access journals prohibit depositing any version of an article to commercial sites like ResearchGate. These misunderstandings indicate a need for librarians to conduct greater education and outreach to faculty around their options for legally sharing published articles.

INTRODUCTION

From electronic journals and repositories to social media, scholars today have many ways of connecting with colleagues and sharing their work online. In recent years, a new tool has emerged: the academic social networking site. Popular sites such as ResearchGate and Academia.edu, both founded in 2008, allow scholars to share their work and virtually connect with other researchers (Matthews, 2016; Van Noorden, 2014). However, unless they have published in fully OA journals, researchers who share their articles on commercial sites are in many cases violating the author agreements they signed with their publishers. Even publishers that allow some level of sharing usually restrict such permissions to posting the author manuscript or preprint version of the article on a non-commercial site, often with an embargo (American Association for the Advancement of Science, n.d.; Cambridge University Press, n.d.; Elsevier, n.d.; Informa UK Limited, n.d.; John Wiley & Sons, Inc., n.d.; Laakso, 2014; Laakso, Lindman, Shen, Nyman, & Björk, 2017; Mac-

millan Publishers Limited, n.d.; Oxford University Press, n.d.; Sage Publications, n.d.; Springer, n.d.).

For universities with open access policies, where faculty members are expected to deposit their scholarly articles in the institutional repository, the prevalence of academic social networks presents an interesting problem. On the one hand, growing levels of participation on such sites indicate that scholars value sharing their work, and that is good news for open access. On the other hand, academic social networks may be competing with IRs and are at odds with the mission of OA policies to provide researchers with a legal, non-commercial, and long term method of sharing their work. To librarians tasked with implementing an OA Policy, it can appear as though faculty are willing to invest more time and effort in posting their articles on academic social networks than in submitting their articles to the library for deposit in the IR.

This article seeks to reveal researcher practices, attitudes, and motivations around uploading their work to ResearchGate and complying with an institutional OA Policy through a study of faculty at the University of Rhode Island. At URI, the Faculty Senate unanimously passed a permissions-based OA Policy in March 2013 in the Harvard model (Shieber, 2015). The policy applies to all URI faculty and stipulates that “each Faculty member will provide an electronic copy of the author’s final version of each article no later than the date of its publication... to the University Libraries” and that the University Libraries may “make the article available to the public in an open-access repository” (University of Rhode Island Faculty Senate, 2013). While designed as a mandate, these types of OA policies are optional in practice due to the presence of a waiver provision and lack of any penalties for non-compliance (Anderson, 2016; Basken, 2016; Fruin & Sutton, 2016; Shieber, 2009; Smith, 2012; Suber, 2012; Zhang, Boock, & Wirth, 2015).

At URI, faculty members are encouraged and expected to share the author manuscript version of their articles through the IR under the terms of the OA Policy. Unlike other institutions that have developed procedures to harvest articles from open sources and publishers by agreement (Duranceau & Kriegsmann, 2013; Duranceau & Kriegsmann, 2015; Fruin & Sutton, 2016; Kilcer, 2015; Kippthut-Smith, 2014a; Kippthut-Smith, 2014b; Smith, 2012), URI has implemented a mostly manual workflow that relies on active faculty participation. We have set up search alerts across a range of search engines, databases, and online journal platforms (e.g. Google Scholar, EBSCO’s Academic Search Complete, ScienceDirect, Web of Science) to keep track of new articles by URI-affiliated authors. A graduate student worker then reviews these citations and contacts faculty members via e-mail to request copies of their article manuscripts. Libraries staff or student workers deposit the article in our IR, DigitalCommons@URI. We also collect the final published

versions of faculty articles from fully OA journals without first contacting faculty, but these articles are not posted under OA Policy Terms of Use and are therefore not counted as OA Policy articles. So far, we have achieved about a 13.6% participation rate, with 103 of approximately 759 full-time faculty members having deposited one or more articles at the time of this writing.¹

Because both our OA Policy workflow and ResearchGate rely primarily on active author participation, it was our hope that a comparison of OA Policy compliance by our researchers with their participation in ResearchGate would reveal whether they prefer one platform over the other and, if so, why and to what extent. Our study would help us understand whether ResearchGate was competing with our IR for faculty-authored content. It would also provide insights that could lead to improvements in our implementation of the OA Policy and greater success in recruiting faculty content.

We chose to compare the faculty's OA Policy compliance with their participation in ResearchGate specifically—rather than Academia.edu or other sites—primarily because ResearchGate has been shown to be the most popular academic social network among scholars (Bosman & Kramer, 2016; Campos-Freire & Rúas-Araújo, 2016; Elsayed, 2015; Jamali, Nicholas, & Herman, 2016; Kramer & Bosman, 2016; Matthews, 2016; Meishar-Tal & Pieterse, 2017; Mikki, Zygmuntowska, Gjesdal, & Al Ruwehy, 2015; Ortega, 2015; Singh, 2016; Tran & Lyon, 2017; Van Noorden, 2014).

LITERATURE REVIEW

Institutional Repositories

Since the early days of institutional repositories, libraries have struggled to fill them with faculty-authored content (Covey, 2011; Davis & Connolly, 2007; Foster & Gibbons, 2005; Harnad, 2006; Jantz & Wilson, 2008; McDowell, 2007; Salo, 2008; Xia & Sun, 2007; Yang & Li, 2015). This lack of participation by researchers has persisted despite

¹ Participation rates are moving targets and are therefore difficult to estimate. At any given time, some of the faculty who complied with the OA Policy may no longer be at the university, while the total number of faculty is constantly in flux. In other words, the populations from which the numerator and denominator of the calculation are drawn are not identical. At the time of this writing in early 2017, 103 full-time faculty members of all ranks had participated in the OA Policy since its inception in March 2013, and the total number of full-time faculty stood at 759, yielding a participation rate of 13.6%. Our September 2016 population study, which yielded a participation rate of 15.4%, excluded lecturers, resulting in 86 OA Policy participants from a faculty population of 558.

studies demonstrating author support for open access repositories (Stone, 2010; Swan & Brown, 2005).

Of many solutions proposed to the faculty participation problem, one tactic in particular that can be effective in increasing the amount of faculty research in IRs is the adoption of strong policies at the institutional level that require deposit (Ferreira, Rodrigues, Baptista, & Saraiva, 2008; Gargouri et al., 2012; Gilbert, King, & Kullman, 2011; Harnad, 2015; Nicholas, Rowlands, Watkinson, Brown, & Jamali, 2012; Swan, Gargouri, Hunt, & Harnad, 2015; Vincent-Lamarre, Boivin, Gargouri, Larivière, & Harnad, 2016; Xia et al., 2012).

There is evidence that in recent years the growth rate of IRs has increased and authors are increasingly willing to contribute their research (Dubinsky, 2014), with younger researchers especially likely to contribute (Nicholas et al., 2013). Marsh (2015) found that “the population of repositories was likely to accelerate in the future” with the “strengthening of national and funder policies,” the “alignment of repositories with current research information systems within universities,” and “the development of metadata and open archives initiative harvesting that will improve discoverability and usage data” (p. 163). A contradictory view is that institutional repositories have “failed to deliver” and that large, central repositories would be more effective (Romary & Armbruster, 2010, p. 2). Van de Velde (2016) has declared the IR obsolete and stated that it must be phased out due to lack of support by scholars, while Poynder (2016, October) believes “it is time for the research community to take stock, and rethink what it hopes to achieve with the IR” (para. 5), as “it is clear there remains little or no appetite for [self-archiving], even though researchers are more than happy to post their papers on commercial sites like Academia.edu and ResearchGate” (para. 6). Similarly, Clifford Lynch thinks that IRs “must be disconnected from the OA agenda for journal articles” (Lynch, 2017, p. 127). Meanwhile, Stevan Harnad (2016), one of the original signatories of the Budapest Open Access Initiative and a strong supporter of Green OA delivered through IRs, tweeted that he has “left the #OA arena.”

Permissions-Based Open Access Policies

North American institutions with permissions-based OA policies of the type first passed by Harvard University’s Faculty of Arts & Sciences in 2008 (Shieber, 2015) also find the recruitment of faculty content to be a challenge (Basken, 2016; Emmett, Stratton, Peterson, Church-Duran, & Haricombe, 2011; Kilcer, 2015; Kipphut-Smith, 2014a; Kipphut-Smith, 2014b; Wesolek, 2014; Zhang et al., 2015). This is despite the fact that faculty have indicated strong support for these and similar policies by passing them by unanimous votes in many cases (“Unanimous faculty votes,” 2016).

Because of the waiver provision included in permissions-based policies and the lack in most cases of any penalty for not complying (Fruin & Sutton, 2016), faculty participation is de facto optional (Anderson, 2016; Basken, 2016; Fruin & Sutton, 2016; Shieber, 2009; Smith, 2012; Suber, 2012; Zhang et al., 2015). OA policy participation rates can be difficult to calculate precisely (Basken, 2016; Swan, 2012), and the methodologies used to calculate them vary, leading to a wide range of estimates. Some estimates for institutions with permissions-based OA policies are: 25% of faculty participating in the University of California system (Basken, 2016); 61% of faculty participating at Harvard (P. Suber, personal communication, November 28, 2016); approximately 70% of faculty participating and approximately 50% of articles at Los Alamos National Laboratory (D. Magnoni, personal communication, November 22, 2016); 14-15% of articles at Rollins College (R. Walton, personal communication, November 29, 2016); 44% of articles at Massachusetts Institute of Technology (E. Finnie, personal communication, November 23, 2016); 47% of articles at Oregon State University (Zhang et al., 2015); 65% of articles at Indiana University-Purdue University Indianapolis (J. Odell, personal communication, November 22, 2016); and 40% of departments at the University of Kansas (Taylor, 2013).

Reported faculty concerns and reasons for non-compliance with OA policies include:

- Burden on faculty / No time
- Duplication of effort when author participates in other open access repositories, e.g. ArXiv, PubMed, SSRN
- Uncertainty about publishers allowing compliance / Belief that publishers will refuse work / Need to negotiate with publishers
- Version confusion / Not wanting to make available any version other than the published version of record
- Fear of effects of OA on traditional publishers, small scholarly societies
- Fear of the university assuming authors' copyrights / Perception of institutional control or coercion
- Belief that policy infringes on academic freedom
- Belief that deposit of work in an IR allows unauthorized use by others
- Not having the final peer-reviewed manuscript
- Confusion about types of works policy applies to
- Belief that OA diminishes the value or prestige of scholarship
- Belief that policy eliminates the peer-review process
- Lack of awareness of policy

(Basken, 2016; Duranceau & Kriegsman, 2013; Emmett et al., 2011; Fruin & Sutton, 2016; Kipphut-Smith, 2014a; Kipphut-Smith, 2014b; Ludwig, 2010; MIT Libraries, 2015; Smith, 2012; Wesolek, 2014; Zhang et al., 2015).

Higher rates of faculty participation are achieved when libraries actively request articles from authors and, as is standard practice at many institutions, deposit articles in the IR on authors' behalf (Basken, 2016; Duranceau & Kriegsman, 2013; Duranceau & Kriegsman, 2015; Emmett et al., 2011; Fruin & Sutton, 2016; Kilcer, 2015; Kipphut-Smith, 2014a; Kipphut-Smith, 2014b; Smith, 2012; Wesolek, 2014; Zhang et al., 2015). Some institutions also make use of a faculty profile tool, for example Symplectic Elements, or harvest faculty publications from other sources when possible, circumventing the need for author cooperation in providing copies of their manuscripts (Duranceau & Kriegsman, 2013; Duranceau & Kriegsman, 2015; Fruin & Sutton, 2016; Kilcer, 2015; Kipphut-Smith, 2014a; Kipphut-Smith, 2014b; Smith, 2012; Wesolek, 2014).

ResearchGate

Much of the literature on ResearchGate is international in scope and reflects an attempt to measure researcher participation levels and characterize researchers' use of the platform. *Nature* found that just under half of the more than 3,500 scientists and engineers they surveyed visit ResearchGate regularly (Van Noorden, 2014), while a recent survey of over 20,000 respondents by researchers at Utrecht University Library found that 61% who have published at least one paper use ResearchGate (Bosman & Kramer, 2016; Kramer & Bosman, 2016; Matthews, 2016). Other measures of the proportion of researchers using ResearchGate range from 15% to 65% depending on the population studied (Campos & Valencia, 2015; Haustein et al., 2014; Laakso et al., 2017; Lupton, 2014; Madhusudhan, 2012; Mahajan, Singh, & Kumar, 2013; Meishar-Tal & Pieterse, 2017; Míguez-González, Puentes-Rivera, & Dafonte-Gómez, 2017; Mikki et al., 2015; Ortega, 2015; Singh, 2016; Tran & Lyon, 2017).

A number of studies have reported that ResearchGate is relatively more popular among researchers in the sciences when compared with the academic social network Academia.edu, which is preferred by researchers in the social sciences and especially the humanities (Bosman & Kramer, 2016; Campos-Freire & Rúas-Araújo, 2016; Elsayed, 2015; Jamali et al., 2016; Kramer & Bosman, 2016; Matthews, 2016; Mikki et al., 2015; Nández & Borrego, 2013; Ortega, 2015; Thelwall & Kousha, 2015; Thelwall & Kousha, 2017; Van Noorden, 2014). Despite these disciplinary differences, however, ResearchGate is more heavily used by researchers overall than Academia.edu (Bosman & Kramer, 2016; Campos-Freire & Rúas-Araújo, 2016; Elsayed, 2015; Jamali et al., 2016; Kramer & Bosman, 2016; Laakso et al., 2017; Matthews, 2016; Meishar-Tal & Pieterse, 2017;

Míguez-González et al., 2017; Mikki et al., 2015; Ortega, 2015; Singh, 2016; Tran & Lyon, 2017; Van Noorden, 2014). Use of ResearchGate is notably higher than that of Academia.edu among senior researchers (Bosman & Kramer, 2016; Kramer & Bosman, 2016; Matthews, 2016; Mikki et al., 2015).

The ability to upload and share the full-text of publications is a feature valued by users of ResearchGate and similar academic social networks (Campos-Freire & Rúas-Araújo, 2016; Corvello, Genovese, & Verteramo, 2014; Elsayed, 2015; Laakso et al., 2017; Marra, 2015; Matthews, 2016; Nicholas et al., 2015; Tenopir et al., 2016; Van Noorden, 2014; Wu, Stvilia, & Lee, 2016). This contributes to ResearchGate being a significant source of freely available scholarly content. Of 122,424 articles sampled in ResearchGate, Thelwall & Kousha (2015) found that 56% contained a full-text publication. A study of highly cited documents on Google Scholar revealed that ResearchGate was the second most common provider of full-text links after nih.gov (Martín-Martín, Orduña-Malea, Ayllón, & López-Cózar, 2015). Another study found that ResearchGate “was the top single source of full-text articles” of a sample of over 7,000 articles on Google Scholar, providing 10.5% of all full-text articles found, compared with 6.5% for nih.gov (Jamali & Nabavi, 2015, p. 1649).

With the exception of Laakso et al. (2017) and Borrego (2017), there does not appear to be any published literature that compares the degree to which authors upload their article full-texts to ResearchGate and self-archive their papers in an institutional repository, and no article to our knowledge has compared authors’ posting of articles to academic social networks with their compliance with institutional OA policies. Thus, it is our hope that this article will contribute new insights to the literature.

METHODS

Our study examines the practices and motivations of full-time faculty at the University of Rhode Island related to compliance with the University’s permissions-based OA Policy and sharing full-texts through ResearchGate. As Rhode Island’s public research university, URI is a land-grant and sea-grant institution. Web of Science identifies the university’s research strengths as engineering, environmental sciences, chemistry, oceanography, marine freshwater biology, pharmacology, and psychology.

The study relies on two sources of information. First, in September 2016 we conducted a population study that examined the level of participation by URI faculty in the OA Policy and ResearchGate to obtain data on the degree to which faculty prefer one platform over the other for sharing the full-texts of their articles. This preliminary analysis was based on publicly available URI faculty profiles on ResearchGate and the URI Libraries’

internal OA Policy tracking statistics. Second, in October 2016 we conducted a web-based survey of URI faculty that sought to capture researchers' understanding of the difference between distributing their articles through ResearchGate versus the OA Policy and what motivates their decisions about participation in each.

Population Study

To compare faculty participation in ResearchGate and the URI OA Policy, we obtained a list of e-mail addresses for URI's 728 full-time faculty from the university's Office of Human Resource Administration. For each e-mail address, we looked up the faculty member's name, department, and rank. Based on department, we assigned each individual to a broad discipline: arts and humanities, social sciences, or STEM (science/technology/engineering/math). During this process, we removed faculty with the rank of lecturer (since they are not expected to publish), faculty who had retired or left the university, administrators and non-faculty who appeared on the list in error, and visiting professors. Removing these individuals enabled us to reduce the amount of time required to conduct the population study, avoiding the need to rely on sampling. The final number of individuals for the population study consisted of 558 full-time faculty members.

For each of these 558 faculty members, we looked up the number of articles they had submitted in compliance with the OA Policy as of the time of the population study, September 2016. This data was based on our internal records of faculty who had submitted Assistance Authorization Forms (confirming in writing their intent to participate in the Policy) as well as automated reports generated by our institutional repository, DigitalCommons@URI.

We also searched for each faculty member's profile on the ResearchGate website. These profiles are fully viewable to anyone logged in to a ResearchGate account. Full-text articles are listed in the "Full-texts" section of the author's "Contributions." For each uploaded text in this section, the "Source" indicates whether it was provided by the author (as opposed to having been uploaded by a co-author or possibly harvested from the open web by ResearchGate, for example). For every URI faculty member on our list who had a ResearchGate profile, we counted the number of full-text articles provided by the author as of the time of the population study, September 2016. To provide the most direct comparison with participation in the OA Policy, we also recorded how many of these uploaded articles had a publication date of March 2013 or later (the month the Policy was passed). For both counts, we excluded any works that would not be covered by the OA Policy, for example posters, book chapters, working papers, and research and technical reports.

We then compared the numbers of participating faculty and contributed articles for both ResearchGate and the OA Policy in total and by broad discipline and faculty rank.

Faculty Survey

Our 23-question survey was aimed at capturing URI researchers' motivations for participating in the OA Policy and ResearchGate and their understanding of the differences between the two services. To facilitate direct comparison of the results, we asked many of the same questions about the OA Policy and ResearchGate. Specifically, the survey asked about: general familiarity with the OA Policy and ResearchGate, level of participation in the two services, motivations for participation or lack of participation, perceived benefits of participation, concerns about participation, and understanding of the legality of sharing work through the OA Policy and ResearchGate. Most questions were multiple choice with some spaces for comments. Survey participants were asked to identify their college and rank, although we did not collect any personally identifiable information. The survey was distributed through SurveyMonkey to 728 full-time URI faculty, using the list of e-mail addresses provided by the Office of Human Resource Administration. Ideally, we would have removed the same individuals from this list that we had removed from our population study. The fact that we neglected to do so resulted in the survey being distributed to lecturers, who composed 4.8% of the survey respondents.

RESULTS

Population Study

In all, we found that 262 or 47.0% of URI faculty in our population study had profiles on ResearchGate. Of these, 190 had contributed full-texts, which amounts to 72.5% of URI faculty on ResearchGate and 34.1% of all URI faculty studied.

A more suitable number for making comparisons with faculty participation in the OA Policy is the number of URI faculty authors with profiles on ResearchGate who uploaded full-text articles published since March 2013, the month the URI OA Policy was passed. Here, we found that 20.3% of faculty on our list contributed full-text articles to ResearchGate in contrast to 15.4% in this population who participated in the OA Policy. The average number of full-text articles submitted per faculty member participating was 3.76 for ResearchGate and 3.65 for the OA Policy. Fourteen percent of faculty contributed full-texts only to ResearchGate and not the OA Policy, while 9.1% of faculty complied with the OA Policy but did not upload articles to ResearchGate. The share of faculty who did both was 6.3%. Thus the proportion of faculty who uploaded articles to

ResearchGate, complied with the OA Policy, or did both was 29.4%, while the proportion of faculty who did neither was 70.6%.

	% of Faculty
URI Open Access Policy	15.4%
ResearchGate (articles published after March 2013)	20.3%

Table 1. Faculty in population study contributing full-texts of articles to the OA Policy and ResearchGate (n=558)

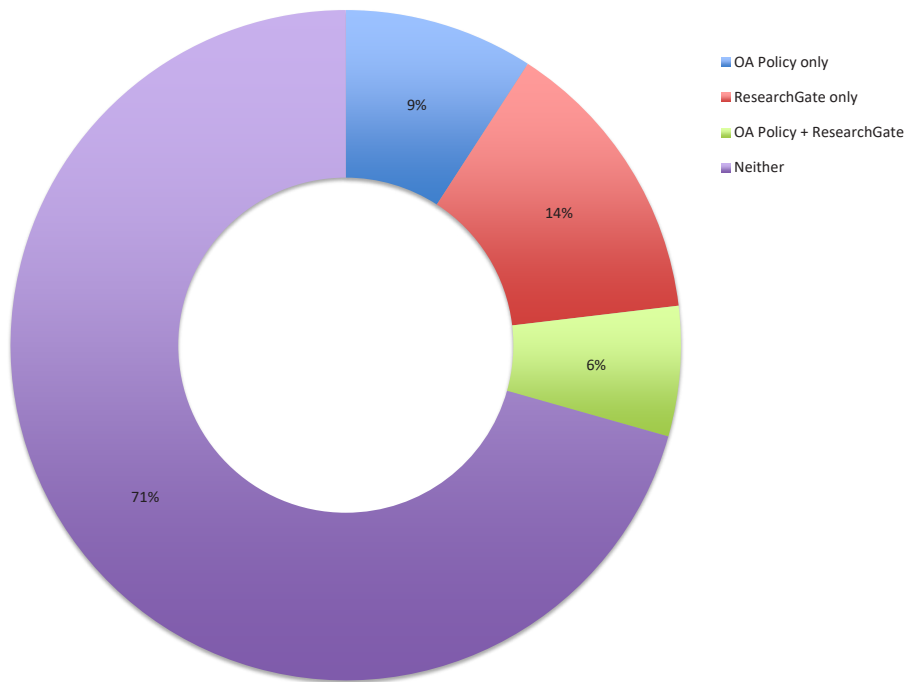


Figure 1. Percent of faculty in population study contributing full-texts of articles to the URI OA Policy, ResearchGate (articles published after March 2013), both the URI OA Policy and ResearchGate, and neither (n=558)

We noticed significant differences in participation rates by discipline. Participation in the OA Policy was strongest among faculty in the social sciences, with 18.9% of all social sciences faculty in compliance, compared with 16.1% of STEM faculty and 0.5% of arts and humanities faculty. The proportion of STEM faculty who contributed full-texts to ResearchGate was highest, at 27.6%, compared with 15.0% of social sciences faculty and only 2.7% of arts and humanities faculty.

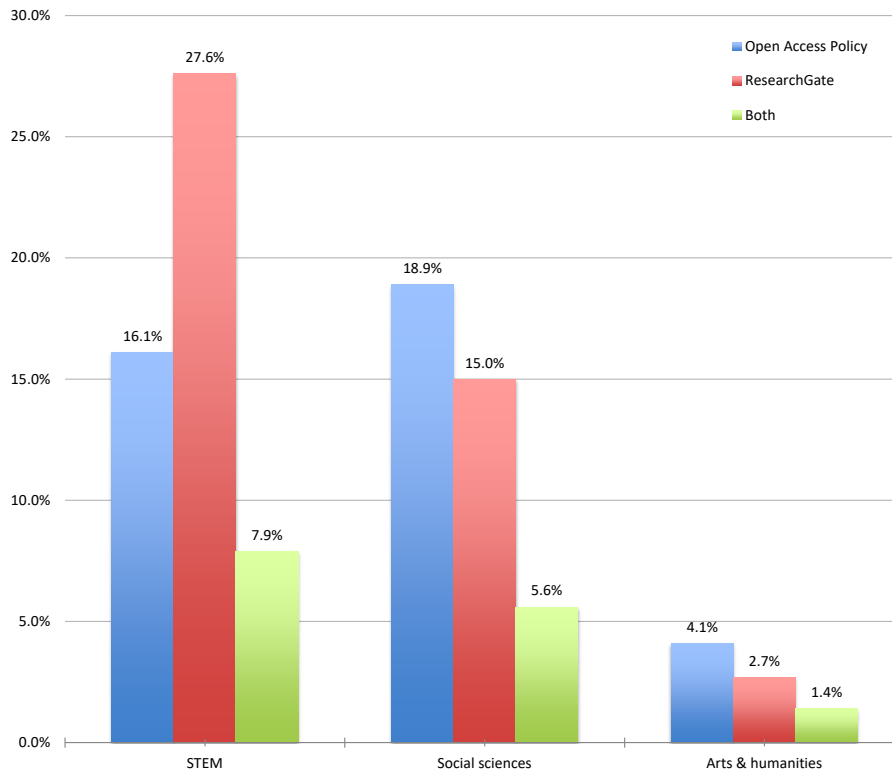


Figure 2. Percent of faculty in population study contributing full-texts of articles to the URI OA Policy, ResearchGate (articles published after March 2013), and both, by broad discipline (n=558)

Differences by faculty rank were also apparent. The proportion of full professors who complied with the OA Policy, at 54.1%, was highest, followed by 11.7% of associate professors and 8.2% of assistant professors. This pattern was the same for ResearchGate, with 74.3% of full professors, 16.7% of associate professors, and 9.2% of assistant professors having contributed full-text articles.

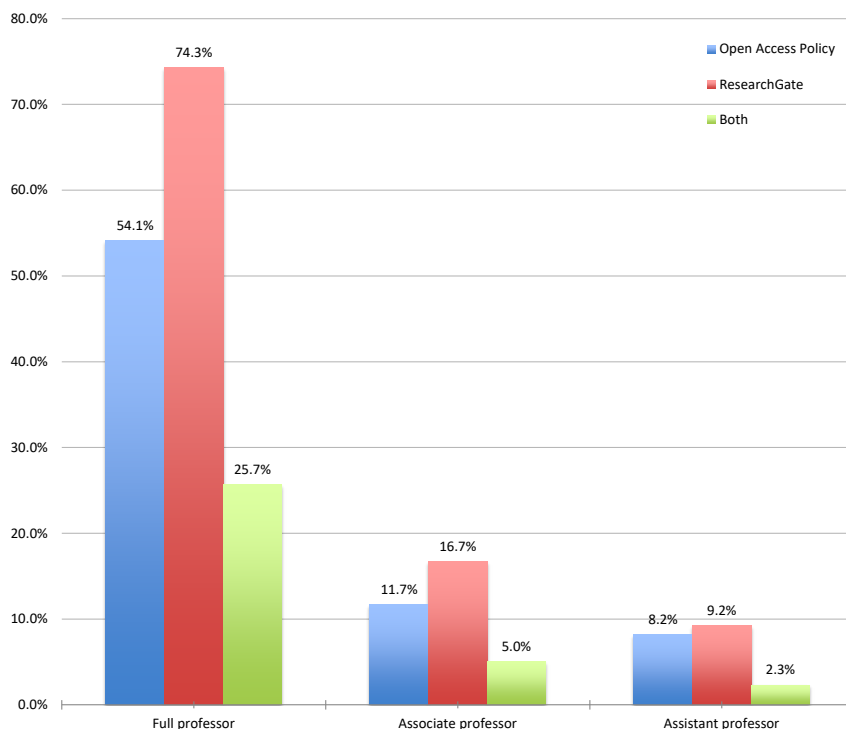


Figure 3. Percent of faculty in population study contributing full-texts of articles to the URI OA Policy, ResearchGate (articles published after March 2013), and both, by rank (n=558)

Survey

Demographics. The survey was distributed to 728 URI faculty via a list of e-mail addresses obtained from the URI Office of Human Resource Administration. This list comprised all full-time teaching, research, and clinical faculty of any rank as of September 2015, the most recent list available. Specifically, faculty in the ranks of professor, associate professor, assistant professor, and lecturer were included. We chose not to survey part-time faculty because although they are covered by the OA Policy, they are not expected to publish, and we do not generally target them with requests for articles. Lecturers are also not expected to publish, yet they were included in the survey population because we neglected to remove them as we had for the population study. To place the full-time faculty population in context, there were 860 total full-time equivalent faculty in 2015-16 (University of Rhode Island, Office of the Provost, 2016). Of the 728 e-mail addresses, 10 were found to be invalid and 8 returned an automated away message. Our overall survey population was therefore 710 full-time faculty members. The survey was open for approximately one month and garnered 135 responses, constituting a 19% response rate.

We asked respondents to identify their rank and affiliated college. Relative to the actual distribution of faculty at the university, we found that full professors were over-represented among our respondents by 12%, while assistant professors were under-represented by 7% and lecturers by 13%. Of eleven URI colleges, respondents from the College of Arts & Sciences were under-represented by 10% while respondents from the College of Environment and Life Sciences were over-represented by 9%.

Familiarity. The survey asked respondents to identify their degree of familiarity with both the OA Policy and ResearchGate. As Table 2 shows, overall, more faculty were very familiar or familiar with ResearchGate than with the OA Policy. To get a more objective assessment of faculty understanding, we asked respondents which of a number of statements applied to the Policy and ResearchGate; some statements were true and others were false. A majority of respondents understood that the Policy applies to faculty and that it targets journal articles but not books and book chapters. However, there was evidence of misunderstanding in that a majority of respondents were unaware that publisher permission is not required to comply with the Policy and that authors may opt out; in addition, a significant minority of respondents thought that the Policy applies to graduate students. A majority of respondents understood that ResearchGate allows researchers to share their research, ask and answer questions, and find collaborators. Though more faculty were “not sure” about ResearchGate (37%) than about the OA Policy (32%), most respondents answered the ResearchGate questions correctly, indicating that there were fewer misunderstandings overall about ResearchGate than about the Policy.

	Open Access Policy	ResearchGate
Very familiar	8.2%	23.0%
Familiar	47.4%	41.5%
Neutral	25.2%	13.3%
Unfamiliar	14.8%	12.6%
Very unfamiliar	4.4%	6.7%
No response	0.0%	3.0%
Total	100.0%	100.0%

Table 2. Familiarity of survey respondents with the URI OA Policy and ResearchGate (n=135)

Participation. We asked respondents if they had participated in the OA Policy by submitting their journal articles for inclusion in DigitalCommons@URI and if they had provided the full-texts of their journal articles to ResearchGate. As Figure 4 illustrates, more faculty indicated that they had complied with the OA Policy (51.1%) than had uploaded full-texts to ResearchGate (42.8%).

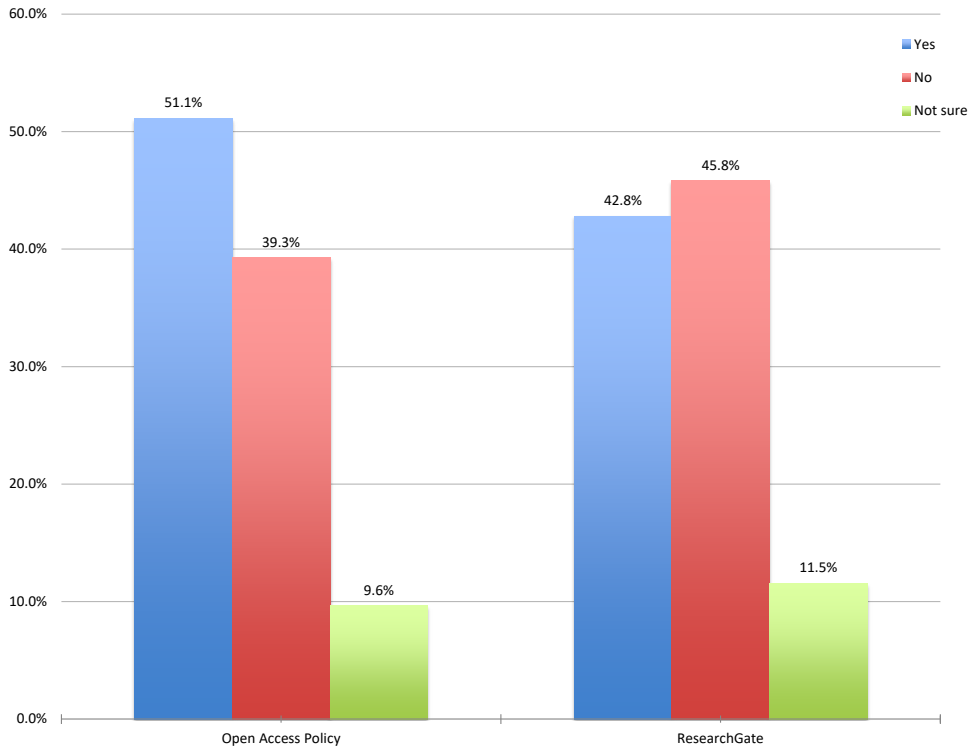


Figure 4. Reported rates of participation in the OA Policy (n=135) and ResearchGate (n=131)

Motivations. The primary motivations for faculty to participate in the OA Policy were “sharing my work more broadly” and “increasing the visibility and impact of my work” (Table 3). These were also top reasons for providing articles to ResearchGate, in addition to “ease of participation,” “connecting with other researchers,” and to a slightly lesser degree, “tracking statistics on downloads of my work.” More faculty perceived ResearchGate as motivating for all of these factors. Under “Other (please specify),” several respondents indicated that they participated in the OA Policy because it is a policy, and so they believed they had to comply, and because they received emails from the library requesting articles. One respondent complied because of “social justice” and another was “supporting open access.” Respondents also provided articles to ResearchGate because they received requests for articles.

	Open Access Policy	ResearchGate
Ease of participation	29.4%	74.6%
Connecting with other researchers	10.3%	65.5%
Sharing my work more broadly	72.1%	76.4%
Increasing the visibility and impact of my work	55.9%	69.1%
Tracking statistics on downloads of my work	25.0%	47.3%
Archiving my work for the long term	25.0%	n/a
Other (please specify)	25.0%	12.7%

Table 3. Motivations for participating in the OA Policy (n=68) and providing articles to ResearchGate (n=55)

Benefits. The benefits of making articles available through the OA Policy and ResearchGate largely mirrored respondents' motivations for participating, with "shared my work more broadly" and "increased the visibility and impact of my work" as the main benefits. ResearchGate was seen as providing a greater degree of benefit overall (Table 4). Under "Other (please specify)," six respondents indicated they were not sure of the benefits of having their articles in DigitalCommons@URI, and five said there were no benefits. By contrast, two respondents were not sure of the benefits of having their articles in ResearchGate, while none reported no benefits.

	DigitalCommons@URI	ResearchGate
Connected with other researchers	8.8%	63.6%
Shared my work more broadly	60.3%	80.0%
Increased the visibility and impact of my work	52.9%	78.2%
Tracked statistics on downloads of my work	36.8%	56.4%
Archived my work for the long term	17.7%	n/a
Other (please specify)	22.1%	9.1%

Table 4. Benefits of having articles available in DigitalCommons@URI (n=68) and ResearchGate (n=55)

Concerns. Respondents were asked if they had any concerns about participating in the OA Policy and having their articles available in ResearchGate (Table 5). The biggest concern related to the OA Policy was dislike of posting the author manuscript versions of articles instead of the final published PDFs. This was followed by the feeling that participation is too time-consuming. The main concern with regard to ResearchGate was about the legality of participation. It is worth noting that over half of the respondents who provided comments in response to "Other (please specify)" said that they had no concerns with either complying with the Policy or uploading articles to ResearchGate. Five respondents commented that it was time-consuming and difficult to check publisher policies to determine what can be shared on ResearchGate.

	Open Access Policy	ResearchGate
Participation is too time-consuming	23.5%	7.3%
I'm concerned that publishers might retaliate and not publish my article or my future articles	10.3%	7.3%
I'm concerned about the effects of Open Access on publishers	11.8%	12.7%
I don't like having my manuscript version available instead of the final published PDF	42.7%	n/a
I'm concerned my work will be plagiarized or misused	8.8%	9.1%
Participation is more difficult when I'm not the lead author	16.2%	14.6%
I'm concerned about the legality of participating	8.8%	30.9%
Other (please specify)	32.4%	41.8%

Table 5. Concerns about participating in the OA Policy (n=68) and having articles available in ResearchGate (n=55)

Author concerns with sharing the final manuscript versions of their articles were revealed not only by the responses to this question, but also in comments in response to a question that asked faculty to rate their experience participating in the OA Policy and to include any suggestions for improvement; a question that asked why faculty had not participated in the OA Policy; a question that asked if faculty had contributed to ResearchGate but not the OA Policy, why?; and a question that asked for any additional comments or concerns. A selection of these comments are reproduced in Table 6 (see next page). When asked in another question what version of their articles authors made available on ResearchGate, 81.8% replied that they posted the publisher's final PDF.

Reasons for non-participation. Table 7 lists responses to the question of why faculty had not participated in the OA Policy and ResearchGate. The primary reason for non-participation in the Policy was dislike for making the manuscript version available instead of the publisher's PDF. The main reason for non-participation in ResearchGate was concern about the legality of participation. The second most common reason for non-participation in both the Policy and ResearchGate was lack of awareness. Under "Other (please specify)," a third of the comments on the Policy expressed concern with posting the manuscript version. Comments about non-participation in ResearchGate related mostly to lack of time or motivation to participate, lack of knowledge about ResearchGate, and wariness of social media.

An open-ended question asked, "If you have contributed to ResearchGate but have not participated in the Open Access Policy, why?" The most common reason was lack of familiarity with the OA Policy, followed by concerns about the version posted, the feeling that using ResearchGate was easier, and the sense that articles on ResearchGate would reach a wider audience than those posted to the institutional repository.

"I didn't understand which version of the document to submit. I'm still unsure. As I get final drafts that still have a couple of changes before they are published. I think that's the copy for open access, but I don't want one that has even a minor typo that we've found to be posted."

"It seems strange to me that I would provide you a copy of the manuscript before that is not the final copy."

"Often getting the final copy of a paper, without journal formatting, from a co-author is difficult. These copies can be messy and make it harder for readers to access and understand the content."

"It is ridiculous to post pre-publication Word Docs or .pdf's. I have decided not to participate."

"It can be a pain to track down the final approved (but not formatted) version of the journal article, if I am not the primary author."

"The fact that I must post the accepted but unformatted version of the ms is very unappealing. Requires additional time putting together the Word version with the pdf (or other format) copies of the figures, adding in the figure and table legends. Not something I would otherwise do."

"I was somewhat uneasy about providing an un-formatted, non-copyedited file to outside audiences."

"I often don't have access to the final version of the manuscript, either because I'm not the lead author or because there are further changes to the manuscript at the editorial level that are not reflected in the final submitted and (otherwise) 'accepted' version of the manuscript."

"the open access formula requiring the final unpublished version shows the lack of understanding the policy has for citations and referencing. In the humanities, CMS for example exact page numbers are required. Thus a manuscript does not offer complete final citations..."

"I disagree with this policy, which leads to multiple different copies of the same work to be circulated. The one that is final and counts is the published version, whereas that in manuscript form may still have typos or other errors that are corrected at the proof-reading stage."

"I don't like posting a manuscript that does not look finished. Oftentimes, electronic submission sites require individual uploads of all figures/tables so the figures/tables are not integrated into the text; it takes time to integrate them for Digital Commons."

"I do not participate in the URI Open Access Policy because the difference between a 'final ms submission' and the published article can be quite large. I do not want my research misinterpreted, especially by graduate students, because what they are reading is not the final product."

"I don't understand the policy. Also, my sense is that it requires a copyedited version of a final manuscript, but not the publisher's version. I often don't have that and don't want to do the work to re-create it."

"URI's Open Access Policy includes extra steps – updating my final version of the manuscript that has NOT been through the final copyediting process. It's a pain and not worth the time."

"I don't like the pre-publication format"

"I do work with lots of visuals and other representations of data. Manuscripts are, in effect, drafts and I am not comfortable posting them to be broadly accessible..."

"If I could upload the final PDF, that would be fine, but don't expect faculty to re-work yet another version of their publications for in house sharing."

"I'd be a lot happier to contribute to URI's depository if they'd let me give them the pdf of the finished article – but I know that that's illegal."

Table 6. Selection of comments related to supplying author manuscript version

	Open Access Policy	ResearchGate
I have not published an article	13.2%	10.0%
I was not aware of the Policy / ResearchGate	26.4%	26.7%
Participation is too time-consuming	22.6%	16.7%
My work is already Open Access through other platforms	18.9%	16.7%
I'm concerned that publishers might retaliate and not publish my article or my future articles	13.2%	3.3%
I'm concerned about the effects of Open Access on publishers	15.1%	3.3%
I don't like having my manuscript version available instead of the final published PDF	32.1%	n/a
I'm concerned my work will be plagiarized or misused	9.4%	8.3%
Participation is more difficult when I am not the lead author	11.3%	6.7%
I'm concerned about the legality of participating	13.2%	31.7%
Other (please specify)	22.6%	31.7%

Table 7. Reasons for non-participation in the OA Policy (n=53) and ResearchGate (n=60)

Opinion of legality. We asked respondents their opinion of the legality of complying with the OA Policy and with posting the full-texts of journal articles on ResearchGate. The results are summarized in Table 8. A slight majority thought that complying with the OA Policy was legal, though many were not sure. A much greater degree of uncertainty was expressed for ResearchGate, with 61.1% not sure.

The comments sections to these questions revealed a lack of understanding of copyright in general and the legal mechanism by which permissions-based open access policies work. A majority of commentators believed that the version posted and/or the publisher policy were the factors that determine legality in the case of both the OA Policy and ResearchGate.

	Open Access Policy	ResearchGate
Legal under copyright law	50.4%	21.4%
Violates the copyright of the publisher	8.4%	17.5%
Not sure	41.2%	61.1%

Table 8. Opinion of legality of complying with the OA Policy (n=131) and posting article full-texts on ResearchGate (n=126)

Statistical analysis. Two multiple linear regression models were applied to the data obtained from selected survey questions using R software. Specifically, participation in the OA Policy was regressed on familiarity with the OA Policy, actual knowledge of the

Policy, opinion of the legality of complying with the Policy, and having provided articles to ResearchGate ($R^2=0.261$). Participation in ResearchGate was regressed on familiarity with ResearchGate, actual knowledge of ResearchGate, opinion of the legality of providing full-texts to ResearchGate, and having provided articles to the OA Policy ($R^2=0.461$). The code for these analyses and the raw survey data have been made available with this publication.

Factors positively associated at a statistically significant level with having participated in the OA Policy were: reported familiarity with the OA Policy, belief that compliance with the Policy is legal, and having provided article full-texts to ResearchGate (Table 9). Notably, faculty who had provided articles to ResearchGate were more likely by 17.0 percentage points to have also participated in the OA Policy than faculty who had not provided articles to ResearchGate, at the 5% level of significance. Faculty members who felt familiar with the OA Policy were more likely to have participated than those who felt neutral by 24.1 percentage points, at the 5% level. Additionally, faculty who believed that the OA Policy was legal were more likely to have participated than those who were unsure by 16.8 percentage points, at the 10% level. All other factors had no statistical effect.

Participated in Open Access Policy (OAP)	Coefficient	Standard Error	Significance Level
Felt familiar with OAP	0.241	(0.100)	5%
Felt unfamiliar with OAP	-0.169	(0.125)	
Had actual knowledge of OAP	0.010	(0.027)	
Believed OAP is legal	0.168	(0.089)	10%
Believed OAP violates copyright	-0.238	(0.147)	
Had provided articles to ResearchGate	0.170	(0.078)	5%

Table 9. Effects of the factors associated with OA Policy participation, $R^2=0.261$

Factors positively associated at a statistically significant level with having contributed full-texts to ResearchGate were: reported familiarity with ResearchGate, actual knowledge of ResearchGate, belief that posting articles to ResearchGate is legal, and having participated in the OA Policy. Belief that posting articles to ResearchGate violates publisher copyright was negatively associated at a significant level with having provided full-texts to ResearchGate (Table 10). Specifically, faculty members who had participated in the OA Policy were more likely to have also contributed full-texts to ResearchGate than faculty who had not participated in the OA Policy by 15.5 percentage points, at the 5% level of significance. Faculty members who felt familiar with ResearchGate were more likely to have posted articles than those who felt neutral by 50.3 percentage points at the 0.1% signifi-

cance level. Faculty who felt posting to ResearchGate is legal were more likely to have participated than those who were unsure by 19.3 percentage points, whereas those who felt ResearchGate violates publisher copyrights were less likely to have posted by 22.4 percentage points than those who were unsure, both at the 5% level of significance. Faculty who had actual knowledge of ResearchGate were more likely to have posted to ResearchGate by 7.8 percentage points than those who did not, at the 5% level. Feeling unfamiliar with ResearchGate had no statistical effect on the model.

Alternative regression models that additionally controlled for faculty rank and college yielded qualitatively identical results.

Contributed Full-Texts to ResearchGate (RG)	Coefficient	Standard Error	Significance Level
Felt familiar with RG	0.503	(0.108)	0.1%
Felt unfamiliar with RG	0.057	(0.110)	
Had actual knowledge of RG	0.078	(0.035)	5%
Believed RG is legal	0.193	(0.084)	5%
Believed RG violates copyright	-0.224	(0.090)	5%
Had participated in Open Access Policy	0.155	(0.065)	5%

Table 10. Effects of the factors associated with ResearchGate participation, $R^2=0.461$

DISCUSSION

Population Study Results

Although the population study revealed that fewer URI faculty had complied with the OA Policy than had uploaded to ResearchGate full-texts of articles published since March 2013, it is likely that our count underestimates the number of faculty who complied with the Policy and overestimates the number who intentionally contributed full-text articles to ResearchGate.

Because our data on OA Policy compliance was based on the individuals who submitted the articles, articles co-authored by two or more URI faculty members were attributed only to the submitting author, lowering our count of faculty members in compliance with the Policy. More significantly, articles published in Gold OA journals under CC-BY or other open licenses were not counted at all because these articles were uploaded to the repository under their Creative Commons licenses and not the more restrictive Open Access Policy Terms of Use (University of Rhode Island, n.d.). In other words, since Gold OA articles do not rely on our OA Policy for their openness, we don't count them as OA Policy articles, even if authors provided us with the articles.

With regard to ResearchGate, our data likely over-represent the number of full-texts intentionally uploaded by URI authors, as ResearchGate has been reported to harvest full-texts from open online sources, assigning them to authors as full-text contributions without the authors' intervention (Anony-Mousse, 2014; Haustein et al., 2014; Jamali & Nabavi, 2015; Mikki et al., 2015; Van Noorden, 2014; Wu et al., 2016).

As reported above, the population study showed that 20.3% of faculty participated in ResearchGate and 15.4% complied with the OA Policy, a difference of only 4.9%. Given that OA Policy compliance is under-represented and ResearchGate participation is likely to be over-represented, the real difference is almost certainly smaller than 4.9%. This strongly suggests that URI faculty are not, to any great degree, using ResearchGate instead of complying with the Policy. In fact, the majority of faculty (70.6%) are doing neither; they may not be sharing their articles at all, or they may be using another method to do so.

Additional insights from the population study involve disciplinary differences with regard to the degree of participation in both the OA Policy and ResearchGate. Participation in the OA Policy and ResearchGate by arts & humanities faculty is low, most likely because articles are not the primary form of scholarly output produced by faculty in these subject areas. In addition, as reported in the literature review above, humanities scholars tend to prefer Academia.edu to ResearchGate. While STEM and social sciences researchers complied with the OA Policy at comparable rates, STEM faculty contributed articles to ResearchGate at a much higher level (see Figure 2), which confirms reports in the literature that ResearchGate is preferred by those in the sciences.

It is interesting that the data show full professors contributing articles to both the OA Policy and ResearchGate at much higher rates than associate and assistant professors (see Figure 3). This is not primarily a factor of the number of years the authors have been publishing, since we only counted articles published after March 2013. This confirms some studies which have found that senior researchers use academic social networks (Elsayed, 2015; Meishar-Tal & Pieterse, 2017; Mikki et al., 2015) and IRs (Cullen & Chawner, 2011; Kim, 2011) at a higher rate, yet it contradicts other studies which concluded that younger researchers are more active users of academic social networks (Jordan, 2014) and are especially likely to contribute to IRs (Nicholas et al., 2013).

Survey Results

The levels of participation in the OA Policy (51.1%) and ResearchGate (42.8%) reported by survey respondents are noticeably higher than the levels revealed by the population

study. The fact that the population study and internal statistics indicate that OA Policy compliance is in the range of 13-15% suggests that faculty who had complied with the OA Policy were more likely to have completed the survey than those who had not, though it is possible that this discrepancy instead reveals a lack of understanding of the Policy and what compliance entails. Similarly, the population study showed that 34.1% of URI faculty had uploaded full-text journal articles (all publication dates) to ResearchGate, suggesting too that survey respondents were more likely to be ResearchGate users than the faculty at large, though it is possible that survey respondents may have conflated having a ResearchGate profile with having uploaded full-texts. If, in fact, it is the case that survey respondents were more likely to have participated in the OA Policy and ResearchGate than the faculty as a whole, then the survey results are not helpful in confirming what portion of the faculty are participants. However, since a good proportion of the survey respondents reported that they had actually complied with the Policy and used ResearchGate, the responses to the survey questions as well as the comments may be especially relevant and insightful.

Respondents indicated that their primary motivations for participation, as well as the benefits of participation, were sharing their work more broadly and increasing the visibility and impact of their work, confirming earlier findings (Creaser et al., 2010; Cullen & Chawner, 2011; Kim, 2011; Manca & Ranieri, 2017; MIT Libraries, 2015; Nicholas et al., 2012; Tenopir et al., 2016). ResearchGate scored higher than the OA Policy on both of these factors. In addition, a number of comments by researchers who had contributed to ResearchGate but had not complied with the Policy indicated that they believe ResearchGate has a wider audience than the institutional repository, a finding identical to that of Borrego (2017). This perception most likely results from a lack of awareness among respondents that the IR reaches a wide audience, but it also reflects the differing nature of the two services. Both DigitalCommons@URI and ResearchGate are well-indexed by Google and Google Scholar, so the discoverability of content on both platforms should be similar. As a social network, however, ResearchGate connects researchers to others in their fields and regularly notifies members of new publications added to the network that might be of interest, leading to enhanced visibility of that content. Yet while publicly-posted content in ResearchGate may be downloaded by anyone on the internet, ResearchGate introduces more friction to the process than the IR because readers are prompted to create an account before downloading or viewing full-text. For this reason there is an argument to be made that making articles available through the IR is a more effective way of sharing work and increasing impact (Odell, 2016).

Also with regard to motivations and benefits, ResearchGate scored higher than the OA Policy on the factors of connecting with other researchers and tracking download statis-

tics on work. Comments by respondents revealed that receiving requests for articles (whether by the library or by ResearchGate and its users) was a motivating factor for participation, confirming prior findings (Cullen & Chawner, 2011; Laakso et al., 2017). A number of respondents stated there were no benefits of having their articles in the IR, or that they were not sure of the benefits. These responses have a number of implications for practice. At the most basic, they reinforce the importance of inputting faculty e-mails in DigitalCommons@URI when uploading articles, so that authors will receive download statistics from the IR. They also provide confirmation that our strategy of contacting faculty to ask for articles induces compliance with the Policy. Finally, they strongly suggest that more education of faculty is needed with regard to the reach of content in DigitalCommons@URI, perhaps through use stories as has been done by Harvard (<https://dash.harvard.edu/stories/>) and MIT (<http://oastories.mit.edu/>).

Echoing the recent findings of Tenopir et al. (2016) and Borrego (2017), a significant theme throughout our survey results was authors' preference for sharing the final published versions of their articles and their dislike for sharing their peer-reviewed manuscripts, the version uploaded to the IR as specified by the OA Policy. Reasons for their dislike of the manuscript version (see Table 6) included a preference for the final published version of record; not wanting multiple versions of the same work to be available; not wanting a version with potential errors and typos to be made publicly available; a belief that the manuscript version was often messy, potentially leading to misunderstandings by readers; the fact that the manuscript version does not share the pagination of the final version, making it difficult to cite; not having ready access to the final manuscript version, especially when not the corresponding author; and the time and effort it takes to reassemble the manuscript version into a coherent whole, for example re-integrating figures and tables into the text.

Given the very strong feelings respondents expressed against posting their author manuscripts in compliance with the OA Policy, and the fact that a perceived benefit of ResearchGate is that it "accepts final PDF versions" as one respondent stated, the survey results, if generalizable, create a problem for OA policies that primarily target authors' final manuscripts.² It is likely from a legal perspective that the copyright licenses granted by faculty authors to institutions under permissions-based OA policies include rights to the article in its "final form" when the publisher's version of record is

² With the exception, of course, of articles published under open licenses and cases in which institutions have made special arrangements with publishers that allow for the posting of the final published articles. See, for example, MIT Libraries' page *Publisher responses to the MIT OA Policy* (<https://libraries.mit.edu/scholarly/mit-open-access/publisher-responses/>).

“substantially similar” to the author’s accepted manuscript (Frankel & Nestor, 2010; Smith, 2014a; Smith, 2016). However, these licenses would not extend to the text of the publisher’s version of record if the publisher introduced substantial changes to the text, a situation that is rare (Klein, Broadwell, Farb, & Grappone, 2016), but possible. Furthermore, publishers’ contributions to the look and feel of the final published PDF (e.g. formatting, publisher branding) may be subject to additional protections under intellectual property law. Hence, even permission to distribute the text of the version of record should be distinguished from permission to distribute the publisher’s PDF with its additional, non-textual elements (P. Suber & K. K. Courtney, personal communication, May 19, 2017). Regardless of an institution’s legal rights in the final published version, leading OA advocates caution that posting publisher PDFs without permission would be “unwise” (K. Smith, personal communication, July 23, 2013; Smith, 2014b) or at least, if not done carefully, could set back the OA movement by creating needless liability to a publisher lawsuit (P. Suber, personal communication, May 15, 2017).

So, if it is not advisable to use permissions-based OA policies to share through IRs final published versions of articles (despite the fact that authors desire this and often choose to post publisher PDFs on academic social networks like ResearchGate), should we regard faculty resistance to sharing author manuscripts as evidence for the conclusions of Van de Velde (2016), Lynch (Lynch, 2017; Poynder, 2016, September), and Poynder (2016, October) that green open access through institutional repositories is a failed strategy, or at the very least, in need of serious re-evaluation? Our view is that this apparent aversion by authors to sharing their pre-publication manuscripts suggests that Green OA achieved through IRs will remain an activity of a minority of authors. Further, it provides evidence in support of recent efforts to hasten the transition to a Gold OA publication system in which, regardless of business model, the final version of record is made available open access.³

³ Some recent initiatives and investigations around transitioning to Gold OA include: Open Library of Humanities (<https://www.openlibhums.org/>); the OA2020 Initiative launched by the Max Planck Digital Library (<https://oa2020.org/>) and related efforts in the United States (<https://oa2020.us/>); a study by the University of California, *Pay it forward: Investigating a sustainable model of open access article processing charges for large North American research institutions* (http://icis.ucdavis.edu/?page_id=286); Wellcome Open Research (<https://wellcomeopenresearch.org/>); support by the Robert Wood Johnson Foundation for the cost of making the *Annual Review of Public Health* open access (<https://annualreviewsnews.org/2017/04/06/public-health-oa/>); and the decision of the Gates Foundation to subsidize OA publication of articles by its researchers in AAAS journals (<http://www.sciencemag.org/news/2017/02/gates-foundation-strikes-deal-allow-its-researchers-publish-science-journals>). Note that Gold OA does not require any particular business model and need not mean open access funded by article processing charges (APCs) (Suber, 2012, pp. 137-138).

Another theme from the survey was a high degree of confusion and uncertainty related to copyright. Although our statistical analysis showed that faculty were more likely to have contributed to the OA Policy and ResearchGate if they believed that participation was legal, suggesting that legality is important to them, comments from survey respondents revealed a belief that the legality of posting one's articles depends on publisher policy and the version of the article posted. While in general this is true when the author's copyright has been transferred to the publisher, many respondents seemed unaware of the legal mechanism of permissions-based open access policies that renders publisher permission moot (Frankel & Nestor, 2010; Priest, 2012). None of the major publishers allows sharing of the final published version of record on commercial sites like ResearchGate, unless, of course, the article was published under a CC-BY license. Yet the publisher's PDF is the version that 81.8% of our survey respondents reported posting on ResearchGate, confirming the findings of other recent studies (Borrego, 2017; Jamali, 2017; Laakso et al., 2017; Tenopir et al., 2016). Even some publishers that allow authors to post accepted manuscripts on non-commercial sites including IRs and personal websites often explicitly prohibit or limit posting on commercial sites like ResearchGate (American Association for the Advancement of Science, n.d.; Cambridge University Press, n.d.; Elsevier, n.d.; Informa UK Limited, n.d.; John Wiley & Sons, Inc., n.d.; Laakso, 2014; Laakso et al., 2017; Macmillan Publishers Limited, n.d.; Oxford University Press, n.d.; Sage Publications, n.d.; Springer, n.d.). Clearly more education of faculty authors is needed in this area as well.

Finally, our statistical analysis of the survey results, in which contributing full-texts to ResearchGate and compliance with the OA Policy were positively correlated, shows that faculty are not using ResearchGate to the exclusion of the institutional repository. While some authors may prefer one platform over the other, many who choose to openly share their full-texts online are using both.

CONCLUSION

Through a multifaceted analysis of URI faculty participation in the institutional OA Policy and ResearchGate, we set out to learn what motivates authors to share their work through IRs and/or academic social networks. We hoped the results would inform and improve our implementation of URI's OA Policy as well as contribute new insights to the literature on permissions-based OA policies and academic social networking. The results of both the population study and faculty survey are surprising in some aspects and predictable in others. We expected to find that researchers were much more likely to share their work through ResearchGate than the IR, which would suggest that academic social networks compete with IRs for content. On the contrary, we found that URI faculty who

posted articles to ResearchGate were actually more likely to have complied with the OA Policy, and vice versa. Only a minority of faculty are participating in either service. Based on this finding, librarians should prioritize recruiting more faculty to share their work in general and should not see academic social networking as a threat to open access. We also found that authors expressed a strong preference for sharing the final, published versions of their articles, and conversely an aversion to sharing the author manuscript versions, a finding that supports arguments for speeding the transition to a Gold OA publishing system. On a more predictable level, our survey uncovered misunderstandings around the OA Policy and copyright issues, indicating a need for more effective education and outreach. Because this study examined the practices and attitudes of faculty at one university, who may or may not be representative of researchers more broadly, further research at other institutions would expand the available evidence on author practices and motivations regarding the use of academic social networks and compliance with permissions-based institutional OA policies.

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