

Scholarly Publishing at a Crossroads: Scholarly perspectives on Open Access

Sarah Rose Fitzgerald, Corresponding author

W.E.B. Dubois Library

University of Massachusetts, Amherst

154 Hicks Way

Amherst, MA 01003

USA

sfitzgerald@umass.edu

413-577-3407

Zhehan Jiang

Baylor College of Medicine

1 Baylor Plaza,

Houston, TX 77030

USA

jiangzhehan@gmail.com

The authors declare that they have no conflict of interest.

The authors did not receive any funding for this research.

CRedit contributions:

Dr. Fitzgerald – Conceptualization, Formal Analysis, Investigation, Methodology, Visualization,
Writing – Original Draft, Writing – Revising and Editing

Dr. Jiang – Conceptualization, Data Curation, Formal Analysis, Methodology, Visualization,
Writing – Original Draft

Scholarly Publishing at a Crossroads: Scholarly perspectives on Open Access

Abstract

The cost of access to scholarly research creates inequity for readers with varying resources. Open access publishing is an avenue to address this inequity. This research employed a survey of scholars to discover what they know and think about open access. The survey elicited both faculty and doctoral student perspectives. Data were analyzed according to rank and discipline. Although the majority of scholars across disciplines agreed that their work should be freely available to all readers, there were significant differences between disciplines regarding whether scholars had distributed their publications through open access. The survey instrument was examined through Exploratory Factor Analysis.

Keywords: open access, scholarly publishing, university faculty, doctoral students, research universities

Introduction

Open access (OA) scholarship is the free online availability of research articles for anyone to legally access, use, and share with attribution to the author (Suber, 2012). While scholarly publications behind paywalls are expensive to access for those outside academia and in developing countries, scholars in well-resourced institutions may not be mindful of this issue because these resources are readily available to them through their institutional library subscriptions. Scholars also may not be aware of their options to make their work openly accessible. This study explores scholars' knowledge of open access and their attitudes toward it.

Even in affluent countries, access to knowledge is limited by steep costs. Housewright, et al. (2013) found that about half of the US academics they surveyed often want articles their library does not offer. The 2019 cancelation of subscriptions to scholarly content by the University of California System and others make this topic especially relevant. When even well-resourced institutions are not willing to subscribe to content through major scholarly publishers, academia must explore other options for accessing knowledge.

Open access includes both gold open access delivered by a scholarly journal, often by charging authors or their funders a publication fee, and green open access, driven by the author, by depositing a pre-print or post-print of an article published in a journal in an institutional repository (IR), disciplinary repository, or on the author's website. The discussion around gold open access and the fees associated with it can sometimes cause confusion among scholars who are wary of predatory publishing schemes which also charge publication fees. Research such as Ithaka's US Faculty Survey, (Housewright, et al., 2013) often asks scholars to rate their concern that journals they publish in are freely accessible online, although green open access methods can allow scholars to make their articles freely accessible online independently of the publication

1
2
3
4 journal. This study examines perspectives on open access in all forms, rather than concentrating
5
6 on the gold open access model. It examines awareness among faculty of the different types of
7
8 open access. The false impression that one must pay an article processing fee in order to make
9
10 one's work open access can lead to unwarranted negative feelings toward open access.
11
12
13

14
15 If scholars are to make socially conscious decisions, they should be aware of their
16
17 research dissemination options. It is especially important to gauge whether faculty and aspiring
18
19 faculty are aware of and interested in open access dissemination options, which make their work
20
21 accessible to people across the world who may benefit from academic research. Examining
22
23 scholars' awareness can identify gaps in their knowledge and identify challenges and
24
25 opportunities for open access publication.
26
27
28

29 30 **Literature** 31

32
33 Open access has multiple benefits. It increases the impact of articles and facilitates data
34
35 mining of scholarly knowledge (Tennant, et al., 2016). Open access articles are cited more often
36
37 than articles only available through toll access (Hajjem, et al., 2006). Readers also download and
38
39 mention open access articles more on social media than toll access articles (Wang, et al., 2015).
40
41
42

43
44 Although there are now several ways of making research articles open access, scholars
45
46 have not adopted the practice widely. Gargouri, et al. (2012) found that only 24% of articles
47
48 published between 2005 and 2010 were openly accessible. However, the adoption of open access
49
50 dissemination varied by discipline. The rates in Math, Earth and Space Science, Psychology,
51
52 Professional fields, and Social Science were higher, while the rates in Chemistry, Clinical
53
54 Medicine, Biomedical Research, Health, Arts, and Humanities were lower. Publishers play a role
55
56 in the percentage of articles which are made openly accessible. Bjork, et al. (2014) noted that in
57
58
59
60
61
62
63
64
65

1
2
3
4 2013, the copyright agreements for only 81% of articles from the 100 largest publishers allowed
5
6 for self-archiving. These authors noted that 94% of all articles in subject repositories were in
7
8 PMC or arXiv, repositories devoted to life science, physics, and math, indicating that scholars
9
10 whose work lies outside science and math are not making considerable use of subject
11
12 repositories. Other fields have not developed the same infrastructure of subject repositories.
13
14

15
16
17 Even when scholars do make their work openly accessible, they often overlook the
18
19 opportunity to deposit it in their institutional repositories. Kim (2010) found in a study of 17
20
21 doctoral granting institutions with institutional repositories that 66.7% of faculty who self-
22
23 archived their publications used their personal webpages, 51.5% used research group websites,
24
25 41.7% used departmental websites, 28.7% used disciplinary repositories, and 22.7% used
26
27 institutional repositories. These choices are far from ideal, as personal and departmental websites
28
29 are not as good about providing persistent access to articles as institutional and subject
30
31 repositories that are designed to preserve access to scholarship. Another advantage that
32
33 repositories offer over personal and departmental websites is that many of them monitor
34
35 submissions for compliance with copyright agreements. As with other types of open access,
36
37 institutional repositories tend to see the most participation from scholars in the sciences
38
39 compared with those in humanities or social sciences (Dubinsky, 2014).
40
41
42
43
44
45

46
47 Rodriguez (2014) noted that 67.1% of the PhD holding US faculty she surveyed reported
48
49 familiarity with open access. Only 28.2% of these had published in an OA journal or repository.
50
51 Gaines (2015) showed that faculty with tenure at the University of Idaho, a Carnegie classified
52
53 “higher research activity” university (CPR, IUSE, 2018), are more familiar with open access than
54
55 faculty without tenure. Her study was limited by a sample size of only 54 faculty respondents.
56
57
58
59 Her focus was also on gold OA journals rather than green OA initiatives like institutional
60
61
62
63
64
65

1
2
3
4 repositories. The current study shifts the focus in research on faculty opinions of open access
5
6 away from the emphasis on Gold OA toward a recognition of the important role of Green OA in
7
8 the changing scholarly publishing ecosystem. It also examines attitudes toward OA in addition to
9
10 awareness of OA, since there may be multiple reasons for choosing not to make one's
11
12 scholarship OA.
13
14

15
16
17 Several researchers have examined which factors influence faculty decisions to contribute
18
19 to institutional repositories. Kim (2011) identified altruism, self-archiving culture, concerns
20
21 about violating copyright, rank, increased citation, and additional effort as factors influencing
22
23 deposit in institutional repositories. Kim noted that 40.1% of faculty were not aware of their
24
25 institution's repositories. Kim also noted that if a faculty member felt the IR made their work
26
27 more accessible, they were more likely to make deposits into it. Tmava and Miksa (2017) found
28
29 that for faculty at the University of North Texas, a Carnegie Classified "Highest Research
30
31 Activity" university (CPR, IUSE, 2018), their willingness to deposit in an institutional repository
32
33 was explained 24.8% by altruism and to lesser extents by concerns over plagiarism and the effort
34
35 of submission. Yang and Li (2015) found that 40% of faculty at Texas A & M University, a
36
37 "Very High Research Activity" institution (CPR IUSE, 2018), had published their work in an
38
39 OA publication, and 7% had deposited work into the university's institutional repository. The
40
41 most common reason faculty gave for not having deposited work in the institutional repository
42
43 was lack of awareness of the process. The survey did not ask respondents to identify whether
44
45 they had made their work open access through a disciplinary repository or a personal website.
46
47 Yang and Li reported that faculty were not aware that Google and Google Scholar index
48
49 documents in institutional repositories, which might explain their limited contributions to the
50
51 repository at their institution. Our survey also tested scholars on their knowledge of IR indexing.
52
53
54
55
56
57
58
59
60
61
62
63
64
65

Conceptual Framework

Studies of faculty opinions of open access often rely on college affiliations to establish disciplinary classifications. This approach is problematic because scholars from the same college often differ in the paradigms they follow regarding scholarly literature and publication. For example, if the humanities and social sciences are lumped together in a single college, then scholars whose disciplines value monographs highly, such as the humanities (Housewright, et al., 2013), and scholars whose fields prefer research articles, such as the sciences, are lumped together. Another disciplinary difference in perspectives on publication comes from the funding of different disciplines. While STEM fields receive a lot of grant money, which may include provisions for gold open access publication or come with stipulations that the research must be publicly accessible, social science and humanities fields receive fewer and smaller grants and therefore have less financial support and fewer mandates for making their work open access. To create a set of disciplinary categorizations whose members share similar research and publication paradigms, this study relies on Biglan's (1973) categorization of academic disciplines. Scholars were asked to identify themselves as members of "applied science" (such as engineering or medicine), "pure science" (such as biology, physics, or math), "applied social science" (such as education, social work, or business), "pure social science" (such as psychology, anthropology, or sociology), or "humanities" (such as art, English, or philosophy). Using Biglan's distinction between applied and pure disciplines allows for variation in the way these scholars tend to approach scholarly literature. Scholars in applied fields are naturally more interested in dissemination of their work to practitioners. Also, while pure disciplines tend to seek and share information through their disciplinary methodological lenses, applied fields tend to draw on a

1
2
3
4 variety of disciplinary lenses to approach their object of study. These differences can impact
5
6 which publication and dissemination mediums are most relevant to their work.
7
8
9

10 **Methods**

11
12 This study employs survey methodology to examine scholarly perspectives on and
13 awareness of open access research dissemination. The authors employed quantitative analysis
14 using descriptive statistics and chi square tests to discover trends in the data as well as an
15 exploratory factor analysis to identify the most valuable questions on the survey instrument for
16 future research.
17
18
19
20
21
22
23
24
25

26 Though previous research on scholarly perceptions of open access has primarily
27 concentrated on faculty members, this study includes doctoral students as well, in order to gauge
28 the attitudes of the faculty of the future. Doctoral students make publishing decisions before they
29 receive their PhDs, since many of them produce articles as students and collaborate on faculty
30 research projects and they must all decide how to publish their dissertations. Engaging beginning
31 scholars in considering publication options is useful in helping them form good habits and make
32 informed choices in their future publishing careers. Carpenter (2012) found that doctoral students
33 in the UK were not aware of or had misconceptions about what open access is. For instance,
34 many students erroneously thought open access journals were not peer reviewed and many were
35 not sure whether authors could archive journal articles in conventional journals.
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50

51 Faculty and doctoral students from a public research university were asked to rate their
52 familiarity with and attitudes towards open access publication. The university is classified as
53 showing “Very High Research Activity” by the Carnegie Classification system (CPR IUSE,
54 2018). The university included 2,009 faculty members and 1,617 doctoral students in fall 2018,
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 when the survey was conducted. With the assistance of the Provost's Office and the Graduate
5
6 School Dean's Office, emails were sent with a link to a Qualtrics survey to all university faculty
7
8 and doctoral students. The survey contained questions regarding university rank, discipline,
9
10 knowledge of open access, and opinions of open access. There were also two open-ended
11
12 questions to allow qualitative responses on open access. After respondents answered whether
13
14 they understood the difference between gold and green open access, they were given definitions
15
16 of both to aid them in the completion of the rest of the questions.
17
18
19
20
21

22 The survey yielded 273 respondents (8% response rate). This included 67 respondents
23
24 from applied sciences, 35 from pure sciences, 78 from applied social sciences, 33 from pure
25
26 social sciences, and 54 from humanities disciplines. Because we felt scholars were most
27
28 qualified to define their own discipline, we cannot provide a response rate for respondents by
29
30 discipline. There were 6 individuals who did not provide a disciplinary identity. The respondents
31
32 included 128 doctoral students and 137 faculty members (21 non-tenure track, 50 tenure track
33
34 without tenure, and 66 tenured). The remaining respondents did not identify their role. Although
35
36 the response rate for doctoral students (8%) was slightly higher than that for faculty (7%), we do
37
38 not observe that the difference compromises the findings from our survey. Findings from the two
39
40 groups are disaggregated where appropriate. As always with voluntary research, the respondents
41
42 may have been those who are most passionate for or against the topic, in this case open access
43
44 research dissemination. Although the web survey format may have decreased our response rate
45
46 (Fan & Yan, 2010), it was the only method available to us to reach all faculty and doctoral
47
48 students at the university. Scholars have many demands on their time, so we expected the
49
50 majority would not respond to the survey request. We sent reminder emails to potential
51
52 participants to increase the response rate.
53
54
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 An exploratory factor analysis was run on the survey data to identify conceptual
5
6 constructs related to interest in Open Access research dissemination. This analysis will be useful
7
8 in refining the survey instrument in order to facilitate future surveys on a national or
9
10 international scale.
11
12

13 14 **Findings**

15
16
17
18 The overall viewpoint on sharing research publicly was positive. Of respondents, 76%
19
20 felt making their work open access would be beneficial for audiences interested in their work.
21
22 Similarly, 75% agreed or strongly agreed that their research should be freely available to all
23
24 readers. Only 6% disagreed or strongly disagreed with this statement. There were not significant
25
26 differences between disciplines. In addition, 71% felt that open access broadens the impact of
27
28 research. Most, 68%, felt researchers should retain the right to post their articles in a repository
29
30 when publishing in a journal. A majority, 55%, felt making their work open access would be
31
32 beneficial for their career. Only 22% felt that the traditional scholarly publishing model works
33
34 well.
35
36
37
38
39

40
41 Troublingly, 74% of respondents said they were “not at all familiar” with the difference
42
43 between gold open access and green open access. This finding was apparent in the open-ended
44
45 responses, many of which equated all open access with gold open access despite a definition of
46
47 each appearing in the survey. Of respondents, 71% were not at all familiar with the SPARC
48
49 Author Addendum to keep their copyright and 40% were not at all familiar with Creative
50
51 Commons Licenses to allow open access. Over 10% of respondents said they were “not at all
52
53 familiar” with the concept of open access publication. Most of these were doctoral students, so
54
55 they may have a chance to learn about open access as they continue their education. A chi square
56
57 test revealed the association between familiarity with open access and role (doctoral student,
58
59
60
61
62
63
64
65

non-tenure track faculty, tenure track faculty without tenure, and tenured faculty) to be statistically significant, $X^2(6, N=264)=16.539, p < .05$. As shown in Figure 1, respondents from the pure fields were more likely to report familiarity with open access than respondents from the humanities or the applied fields.

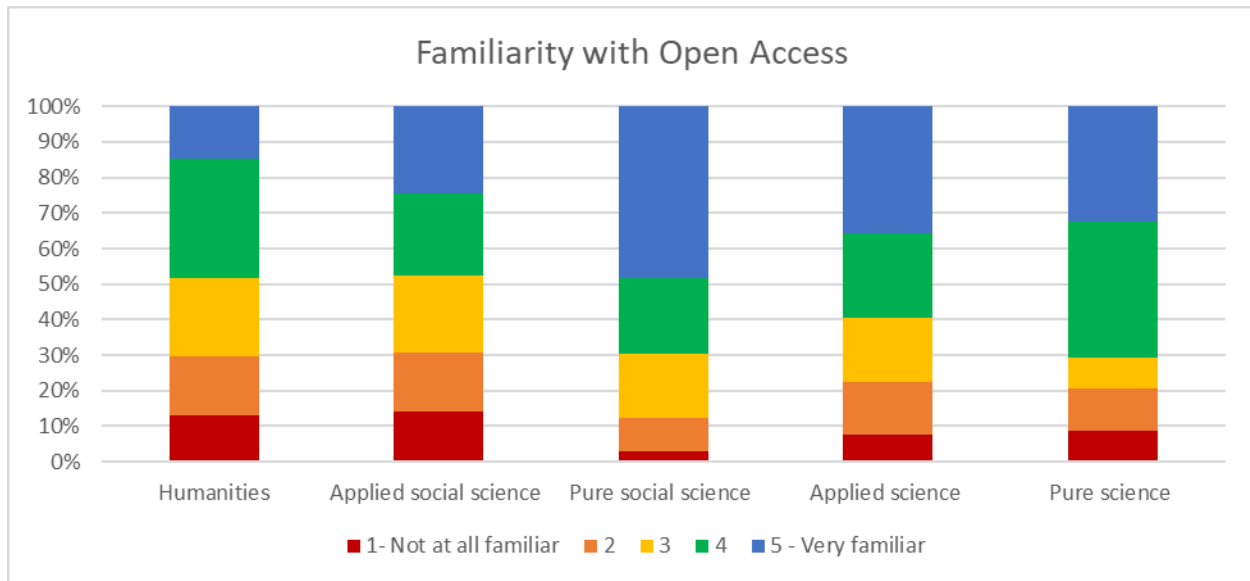


Figure 1. *Percentage of scholars by field who reported familiarity with open access.*

According to the survey, 33% of respondents are very familiar with ResearchGate and Academia.edu, but most were not familiar with more reliable forms of green open access such as institutional repositories and disciplinary repositories. Of respondents, 30% identified Academia.edu or ResearchGate as their ideal outlet to make their work open access, while fewer identified institutional repositories or disciplinary repositories as their ideal outlet. In addition, 47% reported being “not at all familiar” with disciplinary repositories and 31% reported being “not at all familiar” with institutional repositories. This finding is particularly problematic because 23% of respondents expressed concerns about violating copyright agreements, concerns that could be alleviated by working with librarians to make work open access through the

1
2
3
4 institutional repository instead of using ResearchGate or Academia.edu. Of respondents, 89%
5
6 were interested in having copyright and intellectual property guidance from librarians.
7
8

9
10 Several of the survey questions elicited a response of “neither agree nor disagree” from a
11
12 plurality of respondents. This response indicates a lack of knowledge about open access among
13
14 these scholars. This lack of knowledge was expressed in many of the open-ended responses to
15
16 the survey as well. Questions to which the most common response was “neither agree nor
17
18 disagree” included “Research deposited in an institutional repository is accessible through
19
20 Google and Google Scholar,” “If I publish in a subscription publication, I may not make my
21
22 work open access,” and “Research deposited in an institutional repository is freely available to
23
24 all readers”.
25
26
27
28

29
30 Of responding researchers, 44% agreed or strongly agreed that their work reaches those
31
32 they wish to reach, and 38% of researchers were unsure whether their work reaches those they
33
34 wish to reach. Since most respondents have not made their work open access (71%), this finding
35
36 seems to be at odds with the finding that the majority of respondents (75%) feel their research
37
38 should be freely available to all readers. Likely, while researchers feel their work should be
39
40 publicly accessible, the stakeholders they most urgently need to reach are those they are already
41
42 reaching, scholars in their field who are responsible for tenure and promotion evaluation. This
43
44 explanation is borne out by the finding that 97% of respondents reported wanting to reach
45
46 scholars in their field while only 50% reported wanting to reach the general public. Since the
47
48 institution studied is a public institution, taxpayer money contributes to its funding, so the
49
50 university may be considered to have an obligation to make its research accessible. This
51
52 obligation is strengthened by the university’s stated mission, which includes increasing the
53
54
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 knowledge and social condition of the people of the nation and the world through the
5
6 dissemination of knowledge.
7
8

9
10 Only 13% of respondents had published work through gold open access. Slightly more,
11
12 16%, had published work through green open access. Among respondents, 71% had not
13
14 published using either open access option. Given that many of the respondents who said they had
15
16 not made use of either option were doctoral students, some of them may not have published
17
18 anything yet. A chi square test showed the association between publishing gold OA, green OA,
19
20 or neither and role (doctoral student, non-tenure track faculty member, tenure track faculty
21
22 member without tenure, and tenured faculty member) was statistically significant $X^2(6,$
23
24 $N=260)=39.317, p < .001$. Future surveys could differentiate between scholars who have never
25
26 published and those who have published, but not made their work open access. Gold open access
27
28 has been participated in among a larger portion of pure scientists than other fields (most likely
29
30 because of funding opportunities for these scientists). A chi square test showed the association
31
32 between discipline and publishing gold OA, green OA, or neither was significant $X^2(8,$
33
34 $N=262)=16.746, p < .05$.
35
36
37
38
39
40
41

42 Humanities respondents reported the least interest in open access publishing. This is
43
44 understandable, since the monograph culture of the humanities (Housewright, Schonfeld, &
45
46 Wulfson, 2013) does not readily lend itself to current trends in open access opportunities. Fewer
47
48 grant opportunities in the humanities than the sciences also make Gold OA more challenging,
49
50 since Article Processing Fees may be more of a barrier to humanists. However, growing
51
52 pressures to publish articles in the humanities and growing efforts to facilitate open access
53
54 monograph publishing mean open access is not irrelevant to humanists.
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 Of respondents, 45% said they never save PDF copies of their pre-publication
5
6 manuscripts to share in open access venues. Only 15% say they always do. Only 18% reported
7
8 negotiating with journal publishers regarding copyright. Nearly half, 48%, of respondents
9
10 expressed definite interest in making publications available through their institutional repository.
11
12 Only 6% said they were definitely not interested in doing so. Unfortunately, 8% of respondents
13
14 felt they did not have departmental support for making their work open access.
15
16
17
18

19 The open-ended comments often equated all open access with gold open access, despite
20
21 our efforts to define and differentiate gold open access from green open access in the survey text.
22
23 Respondents expressed concerns that OA publication would mean a lack of peer review process
24
25 and a lack of respect from tenure and promotion committees, despite the fact that green open
26
27 access is compatible with many rigorously reviewed and respected journals.
28
29
30
31

32 **Exploratory Factor Analysis**

33
34
35 In order to develop an instrument for measuring attitudes toward open access, we began
36
37 with a correlation analysis to screen out indiscriminative questions, and we conducted an
38
39 exploratory factor analysis (EFA) on our data. These steps allowed a determination regarding
40
41 what factors were predictive of a scholar's interest in making scholarship OA. Only complete
42
43 survey submissions without missing data were used for this part of the analysis, resulting in the
44
45 inclusion of 256 observations. The pairwise correlation plot of the questions can be seen in
46
47 Figure 2. The correlation plot shows the extent to which the answers to pairs of questions were
48
49 correlated with each other. The pairs represented by squares with a darker shade are more highly
50
51 correlated (either positively or negatively) with one another than pairs represented by squares
52
53 with lighter shades. Questions with mean correlations lower than 0.2 with other questions were
54
55 removed prior to the EFA: V10, V17, V19, and V20. The removal, a practice commonly seen in
56
57
58
59
60
61
62
63
64
65

the development and validation of an instrument (see Muris, et al., 1998 for example), was performed due to the inconsistencies of the questions that did not contribute useful information to the latent variables of interest. This step serves as an initial screening prior to the modeling.

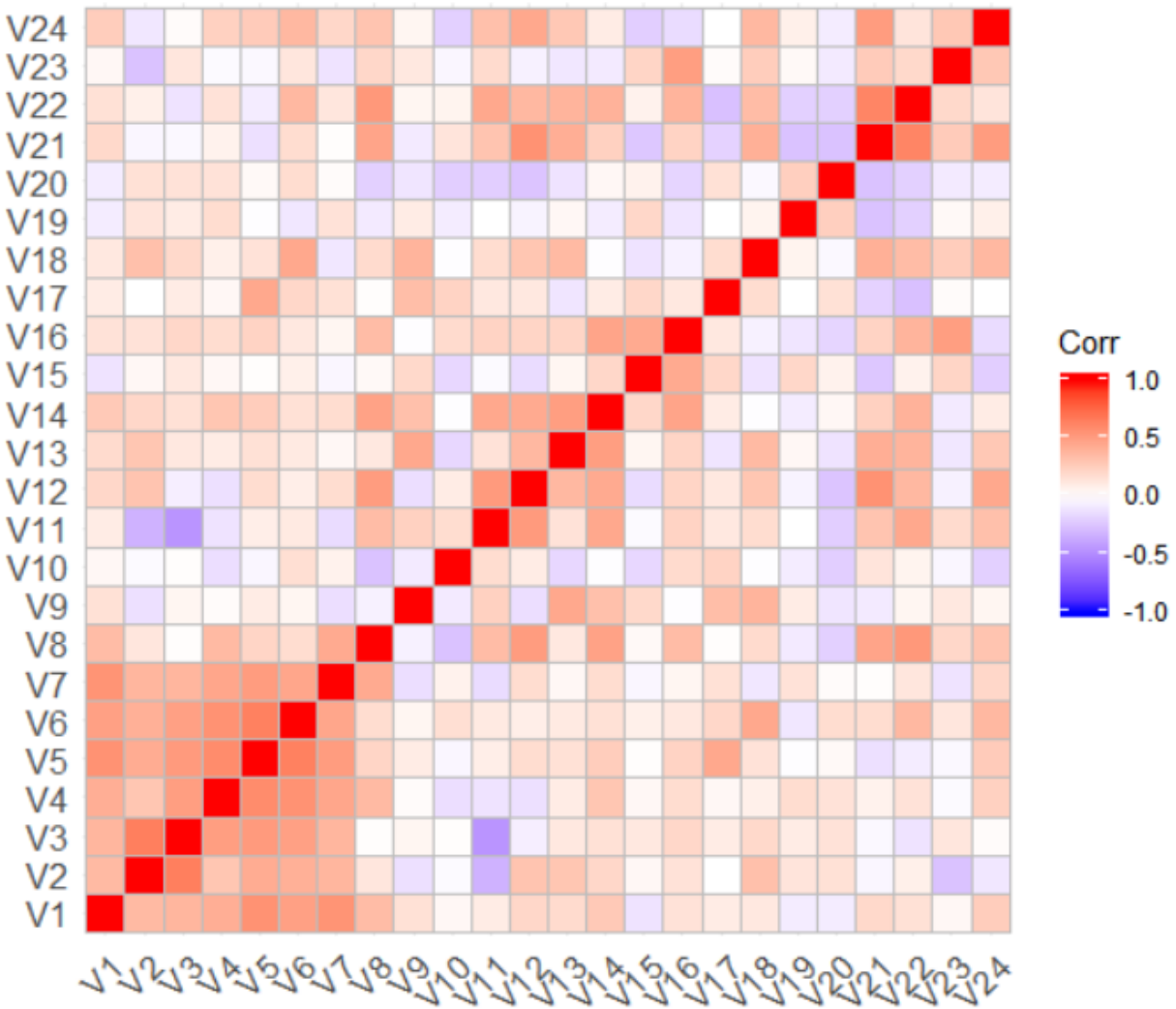


Figure 2. *Pairwise correlation plot of survey questions 1-24*

After screening the selected questions, a scree plot powered by principal component analysis (PC) and factor analysis (FA) extraction techniques was executed and is displayed in the left panel of Figure 3. These two methods of analysis allow the researchers to determine how

1
2
3
4 many factors underlie the data from the 24 questions respondents were asked. According to the
5
6 practical criterion (Zoski & Jurs, 1996), PC and FA did not agree with each other in the number
7
8 of factors underlying the data: PC suggested that there were 3 factors where FA favored 4 factors
9
10 (i.e., the first point of the line that falls below 1). Due to the uncertainty, we fitted both 3-factor
11
12 and 4-factor EFA models for further investigation. The EFA configurations were set to align
13
14 with Hinkin (1998): (1) “oblimin” was selected to perform rotation such that the correlations
15
16 among the factors were allowed and (2) “ordinary least squared/minres” factoring was used, as it
17
18 is known to provide results similar to “Maximum Likelihood” without assuming multivariate
19
20 normal distribution, and derives solutions through iterative Eigen decomposition like principal
21
22 axis. Note that other options, such as “orthogonal” rotation and “Maximum Likelihood”
23
24 estimator, although available in many software packages, are not realistic in many settings. On
25
26 one hand, assuming latent variables independent to each other makes least sense, when they are
27
28 investigated within the same theoretical framework. On the other hand, the fact that data are
29
30 often distributed non-normally often introduces biases into modeling outcomes, if an estimator
31
32 requires strict distributional assumptions. Both 3-factor and 4-factor models yielded poor model
33
34 fits prior to the second round of the question screening. Questions V1, V2, V9, V13, V14, and
35
36 V16 were removed, as their factor loadings were lower than 0.3, showing that the associations
37
38 between these questions and factors were weak. At this point, V3-8, V11-12, V15, V18, and
39
40 V21-24 remained.

41
42
43
44
45
46
47
48
49
50
51 According to Williams (2011), feeding the remaining data to the 4-factor model resulted
52
53 in acceptable fits: (1) the root mean square of the residuals (RMSR) was 0.03, (2) the Tucker
54
55 Lewis Index of factoring reliability (TLI) was 0.965, and (3) the root mean square error of
56
57 approximation (RMSEA) was 0.042 and the 90 % confidence intervals were 0.006 to 0.062. On
58
59
60
61
62
63
64
65

the other hand, the 3-factor model was almost equally good: (1) the RMSR was 0.03, (2) the TLI was 0.959, and (3) the RMSEA was 0.045 and the 90 % confidence intervals were 0.019 to 0.062. We selected the latter model because (1) the 4-factor model possessed a one-item-factor that is impossible to explain and (2) the parsimonious model should be the winner under the statistical rules.

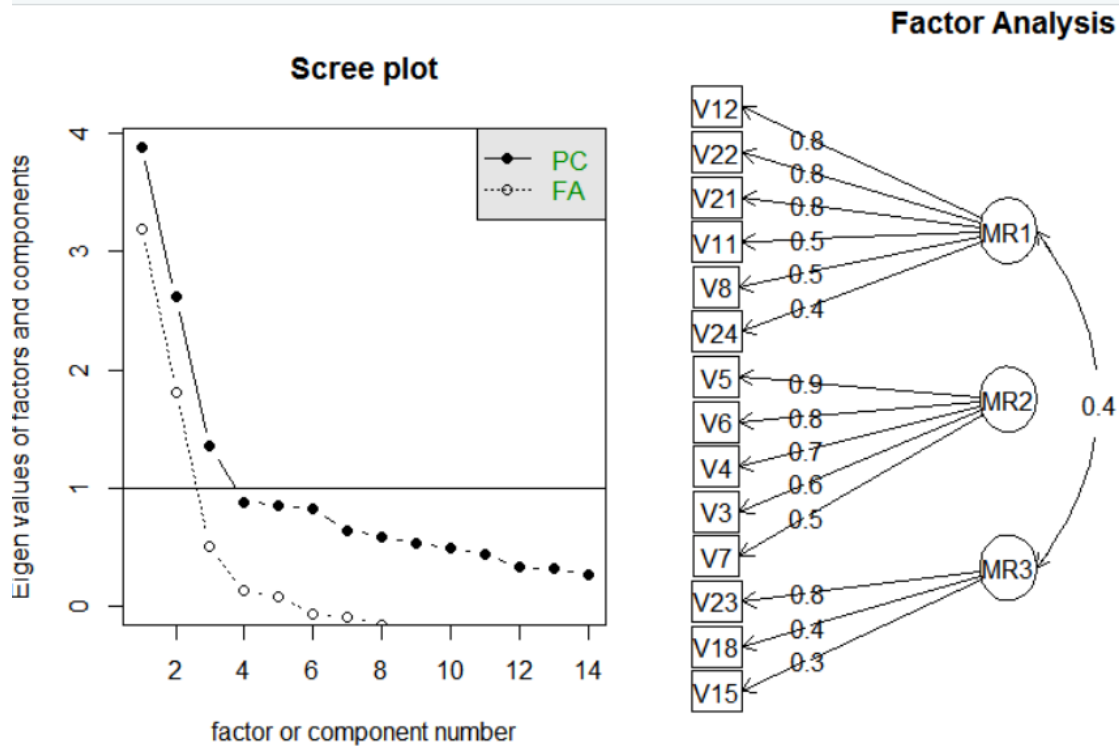


Figure 3. *Scree plot and Factor Analysis*

We now turn to describing the underlying factors. The first factor, MR1, incorporates questions 8, 11, 12, 21, 22, and 24. These questions asked scholars: Rate your agreement with

V8. Open access publishing leads to higher citation rates of articles

V11. My research should be freely available to all readers

V12. Open access broadens the impact of research

V21. Making my work open access is/would be beneficial for my career

V22. Making my work open access is/would be beneficial for audiences interested in my work

V24. Knowing work will be accessible through Google and Google Scholar when placed in an institutional repository makes me more likely to deposit

These questions all relate to scholars' alignment with the consequences of OA, such as whether scholarship should be more financially accessible and whether OA increases the impact of scholarship, so we name this factor "Attitude toward OA".

The second factor, MR2, incorporates questions 3, 4, 5, 6, and 7. These questions asked scholars: Rate your familiarity with

V3. The Sparc author addendum

V4. Creative commons licenses

V5. Institutional repositories

V6. Disciplinary repositories

V7. ResearchGate or academia.edu

These questions all relate to awareness of options for achieving green open access publication, so we name this factor "Familiarity with OA". Two other questions dealt with familiarity with open access, but we suspect that asking scholars to rate their familiarity with open access publication (V1) was too general to determine meaningful differences in their knowledge and asking scholars to rate their familiarity with the differences between gold and green open access (V2) may have been too dependent on specialized terminology.

The third factor, MR3, incorporates questions 15, 18, and 23. These questions asked scholars: Rate your agreement with

1
2
3
4 V15. When I publish in a journal, I negotiate with the publisher regarding the copyright
5 terms
6

7
8
9 V18. Important researchers in my field make their work open access

10
11 V23. I have departmental encouragement to make my work open access
12
13

14 These questions relate to the scholars', disciplines', or departments' participation in the OA
15 movement, so we name this factor "Uptake of OA".
16
17

18 **Discussion**

19
20
21
22 Our finding that 71% of respondents had not made their work open access aligns with the
23 finding of Gargouri, et al. (2012) that a minority of articles are available open access and
24 Rodriguez's (2014) finding that only 28.2% of faculty had published in an OA journal or
25 repository. This is a disappointing confirmation, years later in the open access movement. Our
26 findings confirm those of Gargouri et al. that OA participation varies by discipline, but we found
27 that agreement with OA values does not vary significantly with discipline. Our finding that the
28 majority of scholars support OA is heartening, but the challenge becomes how to facilitate a
29 participation rate in OA that matches the level of approval for OA values among scholars.
30
31
32
33
34
35
36
37
38
39
40
41

42 The findings of this survey highlight the importance of communicating to scholars about
43 the option to make their work open access, particularly the concept of green open access and the
44 advantages of institutional repositories over proprietary research sharing sites. Because our
45 findings show scholars are not familiar with the differences between green and gold open access,
46 educating scholars on their free options to make their work OA could be a step toward increasing
47 participation in OA. Interestingly, although fewer scholars were familiar with green open access
48 than gold, more had published work through green open access than gold. This suggests that
49 green OA has greater appeal despite being less well known.
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 Disciplinary and departmental support for OA dissemination is important to generating
5
6 interest in OA because guidelines around what constitutes a quality tenure or promotion package
7
8 are related to the departmental attitudes toward the value of disseminating research widely.
9

10
11 Departments where alternative metrics beyond journal impact factor are valued in making a case
12
13 for tenure and promotion are warmer environments for OA. Alternative metrics could include the
14
15 number of times articles are downloaded or the number of media mentions of a research project,
16
17 which can be influenced by OA dissemination. A scholar's interest in OA can also be affected by
18
19 how much knowledge their disciplinary and departmental colleagues have to share about Open
20
21 Access dissemination. Departments with many longstanding full professors may not have
22
23 experience with OA dissemination to offer their younger colleagues. On the other hand, the
24
25 protection of tenure may allow longer standing faculty members to think less about their CV and
26
27 more about the potential audiences for their research (Harley, et al., 2010). Librarians may want
28
29 to concentrate OA outreach on science and social science fields where the publishing norms lend
30
31 themselves more readily to open access dissemination. Based on the survey results, it is
32
33 particularly important to bring open access options to the attention of applied social scientists,
34
35 since open access is less of a norm for dissemination in their disciplines and dissemination of
36
37 their results could have a large impact because of their orientation toward practice. Asking
38
39 scholars to save PDFs of their pre-publication manuscripts is a simple task that could make
40
41 research available sooner and start faculty thinking about socially conscious research
42
43 dissemination. Many institutional libraries offer opportunities for scholars to learn about open
44
45 access and copyright options, but they may not take advantage of these opportunities. Strong
46
47 relationships between the library and the departments could be helpful in encouraging
48
49 participation in these opportunities.
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

1
2
3
4 The exploratory factor analysis conducted in this study sets up a basis for conducting
5
6 research on larger scales, nationally or even internationally. Our research was conducted at a
7
8 public institution in an urban setting in the southern U.S. Subsequent research on this topic
9
10 should address differences across institutions in perspectives and knowledge of open access
11
12 options. For instance, does public or private administration of an institution make a difference in
13
14 the climate for and participation in making scholarship publicly accessible? Does institutional
15
16 religious affiliation play a part in scholarly views on open access? Are attitudes at rural
17
18 institutions different from urban institutions? Are there regional differences across the nation?
19
20
21
22
23

24 Future surveys should examine additional questions relating to green and gold open
25
26 access, since this was an area most scholars reported knowing little about. For instance, it would
27
28 be interesting to know whether scholars are concerned about the difficulties in ensuring perpetual
29
30 access to their work through a proprietary hosting site such as ResearchGate or Academia.edu. It
31
32 could also be beneficial to ask researchers whether they are aware that many toll access
33
34 publishers allow them to make their work open access through preprints or post-prints.
35
36
37
38

39 One remedy for the lack of awareness around green open access among scholars might be
40
41 to create a national or international repository that could be shared by scholars at many
42
43 universities. This repository might be promoted more easily than a plethora of individual
44
45 institutional repositories. It might also appeal more to scholars who tend to identify more with
46
47 their disciplines than with their institutions (Austin, 1991). Since scholars often change
48
49 institutions as they earn their doctoral degrees and navigate the academic job market, a
50
51 centralized repository would prevent their work from being associated with an institution they
52
53 are no longer affiliated with. Housing a repository through a single organization of libraries
54
55 could increase consistency in metadata and accessibility for green open access documents and
56
57
58
59
60
61
62
63
64
65

1
2
3
4 diminish duplication of effort across institutions. This centralized repository could also be a
5
6 helpful option for scholars affiliated with institutions that do not have repositories.
7
8
9

10
11
12
13 The authors have no conflicts of interest to declare.
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

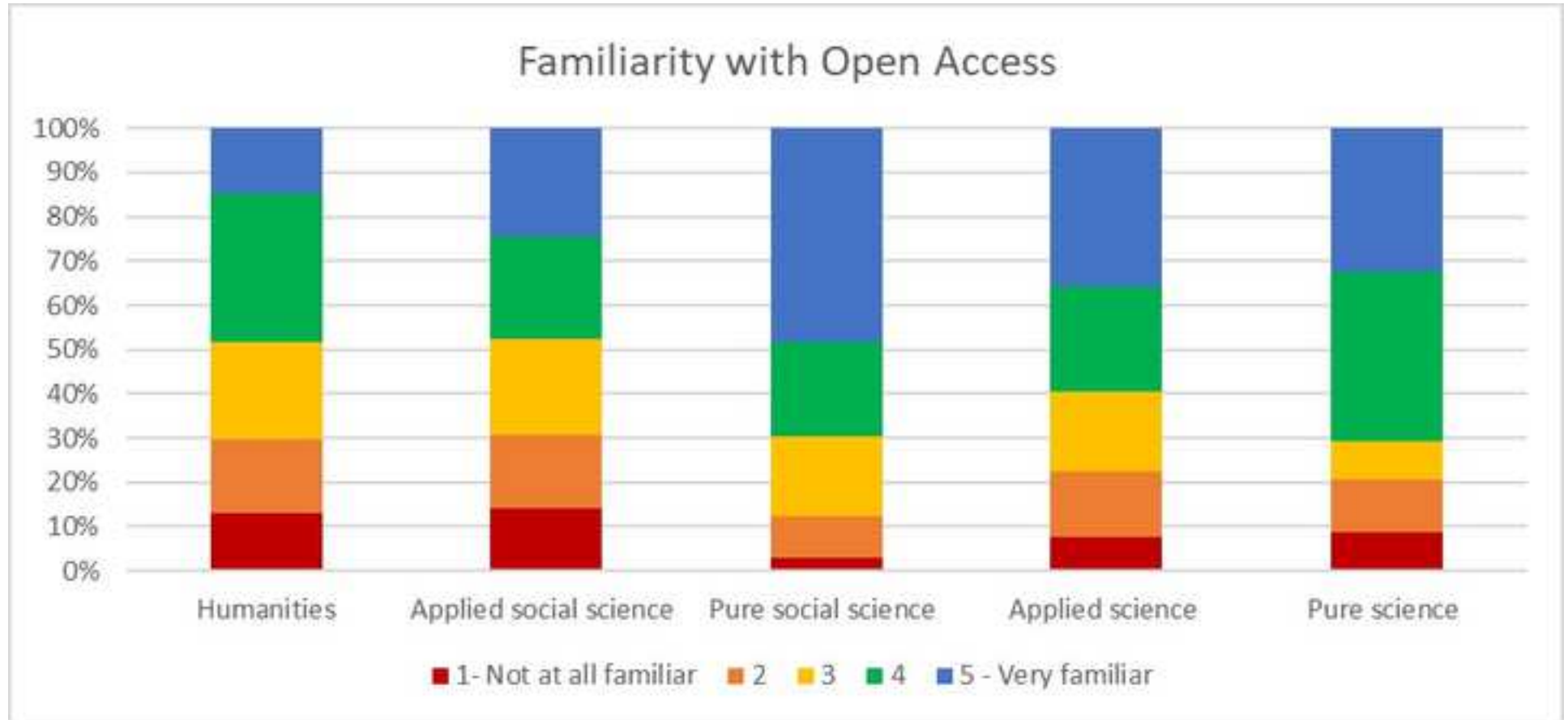
References

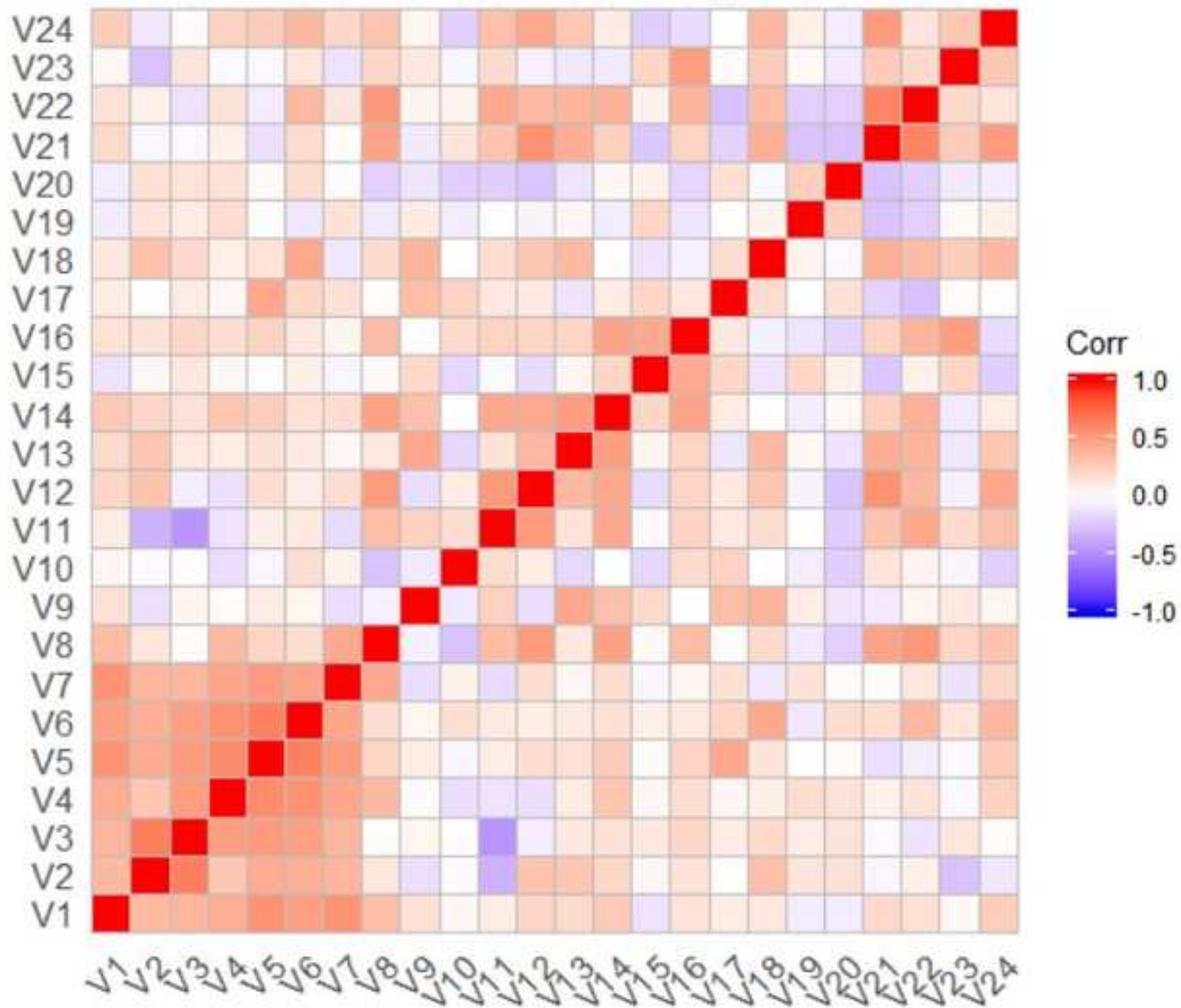
- 1
2
3
4
5
6 Austin, A. E. (1991). Faculty cultures, faculty values. *New Directions for Institutional Research*,
7 1990(68), 61-74. <https://doi.org/10.1002/ir.37019906807>
8
9
- 10 Biglan, A. (1973). The characteristics of subject matter in different academic areas. *Journal of*
11 *Applied Psychology*, 57(3), 195-203. <http://dx.doi.org/10.1037/h0034701>
12
13
- 14 Björk, B.-C., Laakso, M., Welling, P., & Paetau, P. (2014). Anatomy of green open
15 access. *Journal of the Association for Information Science and Technology*, 65(2), 237-
16 250. <https://doi.org/10.1002/asi.22963>
17
18
- 19 Carpenter, J. (2012). Researchers of Tomorrow: The research behaviour of Generation Y
20 doctoral students. *Information Services & Use*, 32(1/2), 3-17.
21
- 22 Center for Postsecondary Research, Indiana University School of Education. (2018). *Carnegie*
23 *Classification of Institutions of Higher Education*. <http://carnegieclassifications.iu.edu>
24
25
- 26 Dubinsky, E. (2014). A current snapshot of institutional repositories: Growth rate, disciplinary
27 content and faculty contributions. *Journal of Librarianship and Scholarly*
28 *Communications*, 2(3), 1167. <http://dx.doi.org/10.7710/2162-3309.1167>
29
30
- 31 Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic
32 review. *Computers in Human Behavior*, 26(2), 132-139.
33 <https://doi.org/10.1016/j.chb.2009.10.015>
34
35
- 36 Gaines, A. M. (2015). From concerned to cautiously optimistic: Assessing faculty perceptions
37 and knowledge of open access in a campus-wide study. *Journal of Librarianship &*
38 *Scholarly Communication*, 3(1), 1-40. <https://doi.org/10.7710/2162-3309.1212>
39
40
- 41 Gargouri, Y., Larivière, V., Gingras, Y., Carr, L., & Harnad, S. (2012). *Green and gold open*
42 *access percentages and growth, by discipline*. <https://arxiv.org/abs/1206.3664>
43
44
- 45 Harley, D., Acord, S., Earl-Novell, S., Lawrence, S. and King, C. (2010). *Assessing the future*
46 *landscape of scholarly communication: An exploration of faculty values and needs in*
47 *seven disciplines*. Berkeley, CA: Center for Studies in Higher Education.
48 http://escholarship.org/uc/cshe_fsc
49
- 50 Hajjem, C., Harnad, S., & Gingras, Y. (2006). *Ten-Year Cross-Disciplinary Comparison of the*
51 *Growth of Open Access and How it Increases Research Citation Impact*.
52 <https://arxiv.org/ftp/cs/papers/0606/0606079.pdf>
53
54
- 55 Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey
56 questionnaires. *Organizational research methods*, 1(1), 104-121.
57 <https://doi.org/10.1177/109442819800100106>
58
59
60
61
62
63
64
65

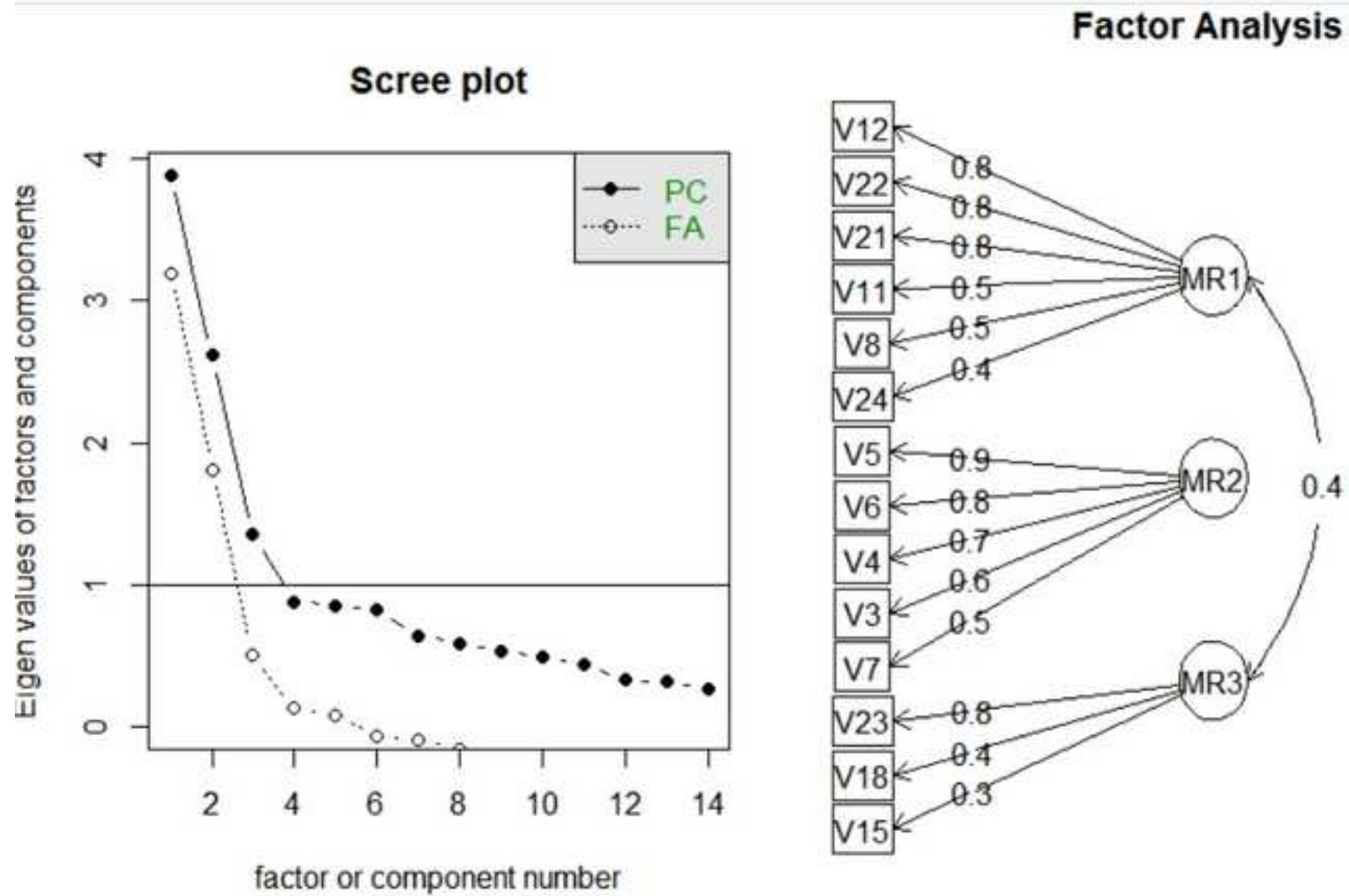
- 1
2
3
4 Housewright, R., Schonfeld, R. C., & Wulfson, K. (2013). *Ithaka S+R US faculty survey 2012*.
5 [http://www.sr.ithaka.org/sites/default/files/reports/Ithaka_SR_US_Faculty_Survey_2012](http://www.sr.ithaka.org/sites/default/files/reports/Ithaka_SR_US_Faculty_Survey_2012_FINAL.pdf)
6 [_FINAL.pdf](http://www.sr.ithaka.org/sites/default/files/reports/Ithaka_SR_US_Faculty_Survey_2012_FINAL.pdf)
7
8
9
- 10 Kim, J. (2010). Faculty self-archiving: Motivations and barriers. *Journal of the American Society*
11 *for Information Science and Technology*, 61(9), 1909-1922.
12 <https://doi.org/10.1002/asi.21336>
13
14
- 15 Kim, J. (2011). Motivations of faculty self-archiving in institutional repositories. *Journal of*
16 *Academic Librarianship*, 37(3), 246-254, <https://doi.org/10.1016/j.acalib.2011.02.017>
17
18
- 19 Muris, P., Merckelbach, H., Schmidt, H., & Mayer, B. (1998). The revised version of the Screen
20 for Child Anxiety Related Emotional Disorders (SCARED-R): Factor structure in normal
21 children. *Personality and Individual Differences*, 26(1), 99-112.
22 [https://doi.org/10.1016/S0191-8869\(98\)00130-5](https://doi.org/10.1016/S0191-8869(98)00130-5)
23
24
- 25 Rodriguez, J. E. (2014). Awareness and attitudes about open access publishing: A glance at
26 generational differences. *The Journal of Academic Librarianship*, 40, 604-610.
27 <https://doi.org/10.1016/j.acalib.2014.07.013>
28
29
- 30 Suber, P. (2012). Open access. MIT Press.
31 [https://mitpress.mit.edu/sites/default/files/9780262517638_Open_Access_PDF_Version.](https://mitpress.mit.edu/sites/default/files/9780262517638_Open_Access_PDF_Version.pdf)
32 [pdf](https://mitpress.mit.edu/sites/default/files/9780262517638_Open_Access_PDF_Version.pdf)
33
34
- 35 Tennant, J. P., Waldner, F., Jacques, D. C., Masuzzo, P., Collister, L. B., & Hartgerink, C. H.
36 (2016). The academic, economic and societal impacts of Open Access: an evidence-based
37 review. *F1000research*, 5. <https://f1000research.com/articles/5-632/v3>
38
39
- 40 Tmava, A. M., & Miksa, S. D. (2017). Factors influencing faculty attitudes towards open access
41 institutional repositories. *Proceedings of the Association for Information Science and*
42 *Technology*, 54(1), 519-522. <https://doi.org/10.1002/pra2.2017.14505401061>
43
44
- 45 Wang, X., Liu, C., Mao, W., & Fang, Z. (2015). The open access advantage considering citation,
46 article usage and social media attention. *Scientometrics*, 103(2), 555-564.
47 <https://f1000research.com/articles/5-632/v3>
48
49
- 50 Williams, L. J. (2011). Decomposing model fit: Measurement vs. theory in organizational
51 research using latent variables. *Journal of Applied Psychology*, 96(1), 1.
52 <https://doi.org/10.1037/a0020539>
53
54
- 55 Yang, Z. Y. L., & Li, Y. (2015). University Faculty Awareness and Attitudes towards Open
56 Access Publishing and the Institutional Repository: A case study. *Journal of*
57 *Librarianship and Scholarly Communication*, 3(1), 1-29. [https://doi.org/10.7710/2162-](https://doi.org/10.7710/2162-3309.1210)
58 [3309.1210](https://doi.org/10.7710/2162-3309.1210)
59
60
61
62
63
64
65

Zoski, K. W., & Jurs, S. (1996). An objective counterpart to the visual scree test for factor analysis: The standard error scree. *Educational and Psychological Measurement*, 56(3), 443-451.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65







Response to reviewer:

Thank you for your specific suggestions on our paper.

We have made the grammatical/mechanical edits you suggested.

We have moved the paragraph on participant choice from the theoretical framework section to the methods section

We have added a paragraph to the methods section which specifically names our research design and research goals

We have added several sentences and a citation regarding our response rate.

We added additional explanation for the exploratory factor analysis for readers unfamiliar with quantitative analysis.