Comparative study of characteristics of authors between open access and non-open access journals in library and information science

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Yu-Wei Chang

Department of Library and Information Science, National Taiwan University, No. 1, Sec. 4, Roosevelt Rd., Taipei 10617, Taiwan

1. Introduction

The advantages of the Internet, including rapid dissemination and high information visibility, make it a well established channel for digital scholarly communication. Threats of a "serial crisis" (decreased academic library subscription to journals because of their rising subscription fees and library budget reductions) have further triggered researchers' expectations for an alternative channel of scholarly communication (Hagenhoff, Blumenstiel, & Ortelbach, 2008; Peekhaus & Proferes, 2015). Launching open access (OA) journals, which allow for free online access to scholarly articles, is regarded as a practical solution to the increasing subscription prices of traditional journals. The development of OA journals began in the early 1990s and has been tracked by numerous studies. The figures reported by Laakso et al. (2011) show a rapid increase in the number of OA journals after 2000. Although a substantial proportion of OA journals have become inactive (noted as far back as Crawford, 2002), new OA journals have been established, and the OA movement has even encouraged well established journals to convert to OA formats. Authors, therefore, now have more options when choosing how to publish. They can select to publish in OA journals which are freely accessible to scholars (but may involve author fees) or in traditional subscription-based journals, some of which allow authors to elect to subsidize open access, and most of which make recent articles available only for paying subscribers during an embargo period (Mammo & Ngulube, 2015; Nariani & Fernandez, 2012; Taylor & Francis Group, 2014).

2. Problem statement

The increase in number of OA journals has begun to attract studies analyzing the characteristics of OA journals. However, few studies have considered authorship characteristics. Because the growth of OA journals relies on author support, the characteristics of OA authors can affect the nature and development of OA journals and are worth investigating. Particularly, growth in numbers of OA journals can be anticipated when barriers to OA journal publishing decrease (Forrester, 2015). It is anticipated that the percentage of academic authors publishing in OA journals will increase every year. However, this assumption must be verified. This research focuses on the characteristics of authors in OA and non-OA journals published during the same period and in the same discipline—library and information science.

Librarians, the practitioners in the field, are largely not concerned with publishing, unlike LIS scholars (called *academics* in this study), who are typically affiliated with LIS degree programs and subject to their tenure practices. Some librarians, however, must conduct research to satisfy institutional requirements for evaluation, promotion, and tenure (Carter, Snyder, & Imre, 2007; Park & Riggs, 1993). Librarians tend to focus on practice-oriented research topics, whereas academics are more likely to be concerned with theory-oriented research topics. Librarians also actively advocate for OA publishing (Palmer, Dill, & Christie, 2009). Therefore, the research topics of OA journals may have a higher probability of being practice-oriented since practice-oriented librarians often advocate for these journals. However, several studies focusing on traditional non-OA LIS journals have reported that librarians were the most prevalent contributing author group (Buttlar, 1991; Olsgaard & Olsgaard, 1980; Watson, 1985). These studies were conducted over two decades ago. It is necessary to examine the most prevalent author group in current LIS journals, leading to the first research question: "Is there a difference in occupation type between authors publishing in OA journals and those publishing in non-OA journals?"

Although LIS academics were identified as the largest group of article authors for LIS journals in recent studies (Aharony, 2011; Chang & Huang, 2012), an increasing trend in the percentage of non-LIS authors was also observed (Chang & Huang, 2012). A higher percentage of non-LIS authors publishing in LIS journals indicates a greater degree of interdisciplinarity in LIS journals. When librarians become OA authors and support OA publishing, does this affect the trend in the percentage of non-LIS authors in OA journals? If OA journals have a higher or just different percentage of non-LIS authors than do non-OA journals, the nature of OA journals may be distinct from that of non-OA journals. This

E-mail addresses: yuweichang2013@ntu.edu.tw, yuweichang2007@gmail.com.

leads to the second research question: "Is there a difference in the proportion of LIS authors who publish in OA and non-OA journals?"

LIS studies have demonstrated that there is limited collaboration between academics and practitioners (Apolinario, Eclevia, Eclevia, Lagrama, & Sagun, 2014; Winston & Williams, 2003). However, a trend toward an increase in the annual percentage of coauthored articles has been identified in LIS (Larivière, Sugimoto, & Cronin, 2012). Authors' tendencies to collaborate with other authors may contribute to an increase in the percentage of articles that are coauthored by academics and librarians, possibly representing a decrease in the research–practice gap. If an increasing trend in the annual percentage of articles coauthored by academics and librarians is observed only in OA journals, this implies that OA journals are potentially appropriate platforms for strengthening the interaction between academics and practitioners. Therefore, the third research question is "Is there a difference in the types of collaborations exhibited by authors publishing in OA and non-OA journals?"

The findings of this research will enhance the understanding of differences in the authorship of OA and non-OA journals. If there are no differences, then it might be assumed that authors who publish in non-OA journals may also support OA journals. However, if differences are revealed in author characteristics between OA and non-OA journals, then it might be assumed that most non-OA authors may remain loyal to traditional (subscription-based) journals. Better understanding of the differences among journals can support more informed decisions about collections and user services, and can help scholars select appropriate outlets for their research.

3. Literature review

The appearance of OA journal publishing means that the traditional scholarly communication process is not the only path available to researchers for publishing their work. Although non-OA journals dominate scholarly communication, some researchers anticipate the expansion of OA journals in scholarly communication because of the advantages and the increasing number of OA journals (Björk, Laakso, & Solomon, 2013; Schroter, Tite, & Smith, 2005). OA journal publishing can potentially compete with traditional academic journal publishing. There has been an increase in the number of OA journals (Laakso et al., 2011), although their influence is usually not as strong as non-OA journal (Davis, 2008; Frandsen, 2009; Testa & McVeigh, 2004; Wang, 2012;), and the changes in the influence of journals are not the same across disciplines (Björk & Solomon, 2012; Hwang, Huang, & Lai, 2012; Kousha & Abdoli, 2010; Mukherjee, 2009a; Norris, Oppenheim, & Rowland, 2008). OA publishing has been the subject of a large amount of literature in the last decade (Frosio, 2014), in LIS as well as other disciplines (Forrester, 2015).

Some surveys suggest that the majority of authors refuse to publish their work in OA journals because OA journals have inferior reputations and visibility compared with non-OA journals (Rowlands & Nicholas, 2005; Swan & Brown, 2004). However, Harnad (2009) asserted a different reason for researchers' wariness of OA journals: a failure to realize the potential benefits of OA journals. Numerous studies have reported that authors tend to first consider the reputation or quality of journals when choosing venues for publishing (Dalton, 2013; Rowlands & Nicholas, 2005). Publishing peer reviewed articles in high quality journals provides advantages for academics in obtaining promotion and tenure (Hendricks, 2010; Peekhaus & Proferes, 2015). However, the extent to which authors are willing to publish work in OA journals varies across fields (Nicholas, Huntington, & Rowlands, 2005; Rowlands & Nicholas, 2005; Spezi, Fry, Creaser, Probets, & White, 2013), suggesting that researchers' attitudes toward OA journals in a specific field cannot be used to determine the attitude of researchers toward OA journals in another field. Other factors considered by authors may include the range of readers targeted by a journal, publication speed, journal subject, relatedness of journal subject to personal research, journal availability, journal rejection rate, publication cost, copyright policy, and personal career benefits associated with journal publication (Björk & Holmström, 2006; Carter et al., 2007; Chuang, 2007; Hsu & Lin, 2011; Nariani & Fernandez, 2012; Nicholas et al., 2005; Park & Qin, 2007; Peterson, 2006; Rowlands & Nicholas, 2005; Swan & Brown, 2004; Warlick & Vaughan, 2007). How authors choose journals is a complex process influenced by various factors beyond just the author's discipline.

The primary focuses of LIS studies in OA journals have included authors' genders, institutional affiliations by type and country, the growth of coauthored papers, and types of collaboration (Ardanuy, 2012; Davarpanah & Aslekia, 2008; He & Spink, 2002; Kaur & Manpreet, 2012; Khurshid, 2013; Lin, 2012; Terry, 1996; Wolfram, 2012).

3.1. Occupations of LIS authors

Various classification schemes for identifying author type have been used in different studies, usually based on a relatively limited number of journal articles (Norelli & Harper, 2013; Olsgaard & Olsgaard, 1980; Weller, Hurd, & Wiberley, 1999; Wiberley, Hurd, & Weller, 2006; Winston & Williams, 2003; Zemon & Bahr, 1998). Chapman and Pike (1993) divided authors into five groups: librarians, LIS faculty, LIS students, other faculty, and other. Other researchers have divided librarian authors by type of library and produced classification schemes comprising numerous categories. Olsgaard and Olsgaard (1980) classified authors of LIS journal articles into six categories: academic librarians, public librarians, other librarians, LIS faculty, other faculty, and other. Watson (1985) divided authors into 11 groups, 7 of which are related to librarians. The remaining groups comprise LIS faculty and students, other faculty, the corporate sector, and other. Buttlar (1991) developed a more detailed classification system comprising 22 categories differentiated according to authorial occupation. Most categories are related to the category "librarian", and are separated according to job responsibilities and position. Winston and Williams (2003) devised a classification scheme comprising seven categories: academic librarians, academic library administrators, public librarians, LIS faculty, other faculty, doctoral students, and other. They found that academic librarians were the most prevalent authors, which was consistent with studies by Olsgaard and Olsgaard (1980), Watson (1985), and Buttlar (1991). Some studies have used simpler classification categories to analyze librarian authors or academic librarian authors specifically. Only two categories, academic librarians and others, were used by Mercer (2011), and Finlay, Ni, Tsou, and Sugimoto (2013) classified LIS articles into three groups: librarians, nonlibrarians, and librarian-nonlibrarian collaborations.

3.2. Disciplines of authors in LIS journals

Although LIS researchers dominate LIS journal article authorship, researchers outside LIS have also contributed. Aharony (2011) investigated 10 LIS journals published from 2007 to 2008. LIS authors accounted for the largest group (27.08%) among 19 disciplines. Walters and Wilder (2015) reported that over half of the top 50 authors were LIS researchers in an investigation of 31 LIS journals between 2007 and 2012. Related studies have determined that LIS researchers collaborate with researchers from different disciplines (Chen & Liang, 2004; Qiu, 1992). Qiu (1992) analyzed coauthored articles in 24 LIS journals and found that LIS researchers collaborated with researchers from 10 disciplines outside LIS. Chang and Huang (2012) examined the characteristics of and changes in LIS interdisciplinarity over a 30-year period, finding that the level of LIS interdisciplinarity had increased, indicating that LIS researchers have been increasingly coauthoring articles with authors from other disciplines.

3.3. Types of collaboration used by LIS authors

Although single-author articles are the most prevalent in LIS literature, numerous studies have investigated multiauthor articles (Apolinario et al., 2014; Buttlar, 1991; Chapman & Pike, 1993; Weller et al., 1999;

Wiberley et al., 2006). A trend toward a rise in the number of coauthored articles in LIS has been identified (Larivière et al., 2012; Sin, 2011; Terry, 1996), resulting in increased focus on research collaboration, including the types of collaboration in which authors engage. Sin (2011) divided coauthored articles in six LIS journals into national and international collaboration categories and compared the trends in collaboration types among six regions. Winston and Williams (2003) indicated that authors preferred to collaborate with colleagues who have occupations that are similar to their own, and that few articles had been coauthored by academic librarians and LIS faculty members. Apolinario et al. (2014) similarly found that most coauthored articles had been published by academic librarians employed at the same institutions. Librarian–researcher collaboration appears to be rare. Norelli and Harper (2013) reported that, although faculty members were not the main research partners of librarians, an increase in the number of articles coauthored by librarians and faculty members was observed. However, they did not present figures to support the extent of collaboration between librarians and other collaborators.

Most of the research described above was conducted in traditional journals. Although OA journals have been in existence for well over a decade, few studies have focused on the characteristics of authors in OA publishing. Mukherjee (2009b) analyzed the characteristics of articles in 17 OA LIS journals between 2000 and 2004. Single-author articles were the most prevalent (56.3%). Most coauthored articles were published by authors in the same institution (67.1%). Only 7.4% of coauthored articles involved international collaboration. Most authors were from academic institutions and developed countries. Mukherjee (2009b) focused on bibliometric characteristics, including author gender, country, institution type, author prolificacy, number of authors per article, and type of collaboration by institution. Chen (2011) investigated the country of origin and publication language of LIS OA journals as well as the databases that have indexed LIS OA journals. Chang (2015) analyzed the characteristics of 19 LIS OA articles written by librarians and confirmed that librarians are interacting with researchers with increasing frequency.

4. Methodology

4.1. Data collection

To collect data related to author occupation, author affiliations listed in articles recently published in LIS non-OA and OA journals were examined. The non-OA and OA journals selected in this study had to meet six requirements. First, the journals were required to carry peer-reviewed research articles (this was ascertained from journal websites). Second, the language of publication had to be English. Third, to ensure journals were LIS-oriented, LIS journals defined in this study were required to be indexed by at least two of four LIS databases: Library and Information Science Abstract; Library Literature & Information Science; Library, Information Science, and Technology Abstract; and Library & Information Science Source. This was verified by searching the Ulrichweb Global Serials Directory. Fourth, the journals were required to provide sufficient author affiliation information to assist in the identification of author occupation; in addition to author and institution name, data concerning job titles were necessary. Only journals detailing author information in over half the articles were selected. Articles without detailed occupational information for all authors were excluded. Fifth, journals were required to have published research articles between 2008 and 2013; many journals did not provide detailed author information before 2008. Six, a journal could appear in both non-OA and OA journal lists if it changed from a non-OA journal to an OA journal after 2008. Articles published in the non-OA period were regarded as non-OA journal articles.

LIS non-OA journals were selected from those in the subject category of "Library Science and Information Science" in the 2012 version of Journal Citation Reports. LIS OA journals were chosen from those listed in the Library and Information Science category indexed by the Directory of

Table 1
List of OA journals.

No.	Journal title	No. of articles	No. of authors
1	Chinese Librarianship: An International Electronic Journal	60	114
2	Code4Lib Journal	164	311
3	College & Research Libraries	81	174
4	Evidence Based Library and Information Practice	73	137
5	Information Research: An International Electronic Journal	137	289
6	Information Technology and Libraries	39	68
7	International Journal of Information Dissemination and Technology	147	267
8	Issues in Science and Technology Librarianship	65	120
9	Journal of Information Literacy	60	108
10	Journal of Information, Information Technology, and Organizations	27	62
11	Journal of Library Innovation	19	39
12	Journal of the Medical Library Association	127	388
13	Liber Quarterly: The Journal of European Research Libraries	101	141
14	Library and Information Research: Research into Practice for Information & Library Services	40	71
15	Library Philosophy and Practice	534	910
16	Libres: Library and Information Science Research Electronic Journal	19	31
17	School Library Media Research	16	31
18	Singapore Journal of Library & Information Management	22	53
19	Urban Library Journal	34	60
20	Webology	42	72
	Total	1807	3446

Open Access Journals (DOAJ) in May 2013. Applying the selection criteria outline above resulted in a final data set of 20 OA journals (Table 1) with 1807 articles and 13 non-OA journals (Table 2) with 1665 articles. Given the imbalance in size, analyses focused on differences in percentages between non-OA and OA journals, not differences in numbers. The total number of unique journals was 31, as two journals changed to OA during the time period under study. For purposes of the analysis, each of these was treated as two separate journals – one OA and one non-OA.

4.2. Data analysis

The data concerning author occupation and affiliated institutions were extracted from the full text of articles. Coding was completed for characteristics such as occupation, academic rank, and type of collaboration. Five categories of occupation were identified in the first stage:

(1) Librarians: authors who worked in libraries or archives.
(2) Academics: this category consists of two subgroups: "faculty

Table 2
List of non-OA journals.

No.	Journal title	No. of articles	No. of authors
1	African Journal of Library Archives and Information Science	86	145
2	Australian Library Journal	89	134
3	Canadian Journal of Information and Library Science	48	75
4	College & Research Libraries	101	185
5	Electronic Library	319	670
6	Government Information Quarterly	274	615
7	Information Technology and Libraries	57	109
8	Libraries & The Cultural Record	44	48
9	Library & Information Science Research	88	191
10	Library Quarterly	76	128
11	Library Resources & Technical Services	100	165
12	Library Trends	222	396
13	Libri	161	325
	Total	1665	3186

members" and "researchers." Faculty members were defined as teachers with various academic ranks in universities and colleges. Faculty member academic ranks were individually coded. Variations in the names of academic ranks across countries were standardized and divided into four levels of academic rank: professor, associate professor, assistant professor, and lecturer. Librarians with academic positions were also included and faculty members without academic ranks were coded as "unidentified." Researchers were defined as those who worked for a variety of organizations, such as academic institutions and corporations, or as those who were independent researchers. The key difference between a faculty member and a researcher is whether the author has an academic rank

(3) Students: undergraduate and graduate students.
(4) Others

When there was not enough information for detailed coding about an author's job, or the job title did not reflect the occupation, the author's biographical information was researched on the Internet. If an author's occupational category could not be identified, the article was excluded. In addition, once occupation had been determined, all authors were divided into two groups to determine how many authors were LIS professionals. Authors who worked in libraries or related organizations or were affiliated with LIS departments were classified as LIS professionals.

Ten types of collaborations that produced coauthored articles were established based on occupational category:

(1) librarian–librarian collaboration
(2) librarian–academic collaboration
(3) librarian–academic–student collaboration
(4) librarian–academic–other collaboration
(5) librarian–other collaboration
(6) academic–academic collaboration
(7) academic–student collaboration
(8) academic–student–other collaboration
(9) academic–other collaboration
(10) other

5. Results

5.1. Occupation distribution

Table 3 shows the proportions of four author groups identified by occupation. Academics dominated LIS authorship in the 33 LIS journals (46.4%), followed by librarians (40.2%). Students were ranked third (7.6%). Over half the authors publishing articles in OA journals were affiliated with libraries (53.9%). Academics were ranked second (35.6%). Students were the smallest group. By contrast, in the non-OA journals, 58.1% of authors were academics. Librarians were the second largest group of authors (25.5%). Students were the third largest author group, followed by others. A significant statistical difference in the distribution of authors by occupation was found between OA and non-OA journals using Pearson's chi-square test (p = 0.05).

In this research, because they are the primary contributors to scholarly journal articles, faculty members (the bulk of the academics group)

Table 3
Comparison of distribution of occupation between OA and non-OA journals.

Occupation	All journals		OA journals		Non-OA journals	
	No. authors	%	No. authors	%	No. authors	%
Academics	3079	46.4	228	35.6	1851	58.1
Librarians	2669	40.2	1856	53.9	813	25.5
Students	501	7.6	174	5.0	327	10.1
Others	383	5.8	188	5.5	195	6.3
Total	6632	100.0	3446	100.0	3186	100.0

Table 4
Faculty authors by academic rank in OA and non-OA journals.

Faculty members by academic rank	OA journals			Non-OA journals		
	No of authors	%	No of articles	No of authors	%	No of articles
Professor	330	31.8	279	613	36.6	505
Associate professor	239	23.0	205	441	26.3	387
Assistant professor	328	31.6	288	468	27.9	395
Lecturer	134	12.9	117	140	8.4	129
Unidentified	8	1.6	7	14	0.8	14
Total	1039	100.0		1676	100.0	

were further divided and analyzed by academic rank. Because the proportion of academic authors in OA journals was much lower than that in non-OA journals (35.6% vs. 58.1%), a large discrepancy in the percentage of academics with a specific academic rank between OA and non-OA journals was found. Table 4 shows the proportion of the total number of academics publishing in OA and non-OA journals by academic rank. Professors dominated OA journal article authorship (31.8%), closely followed by assistant professors (31.6%). A similar result appeared in non-OA journals, professor and assistant professors were the primary two groups. However, a significant statistical difference was identified in the distribution of researchers with various academic ranks between OA and non-OA journals (p = 0.05). Professors and assistant professors, the two largest groups of faculty members, contributed a higher number of articles to OA and non-OA journals than did associate professors and lecturers.

The percentages of librarian and "other" authors publishing in OA journals (Fig. 1) were found to decrease annually, and there were annual increases in percentages of academics and students. The same was true for non-OA journals. The large discrepancies in the annual percentages of academics and librarians publishing in OA and non-OA journals were highlighted in this research: Librarians were the leading authors in OA journals, whereas academics were the leading authors in non-OA journals.

5.2. Library and information science authors

Table 5 shows the proportion of LIS authors in OA journals and non-OA journals. OA journals had a higher proportion of LIS authors (72.4%) than non-OA journals (64.3%). Librarians dominated LIS authorship with 53.9%, indicating that over half of the OA authors were practitioners. In addition, a large discrepancy was observed between librarians and academics regarding LIS authorship. Although LIS academics are the primary LIS authors for non-OA journals, the discrepancy in percentage between librarians and LIS academics in non-OA journals is much lower than that in OA journals (6.3% vs. 38.4%). For non-LIS
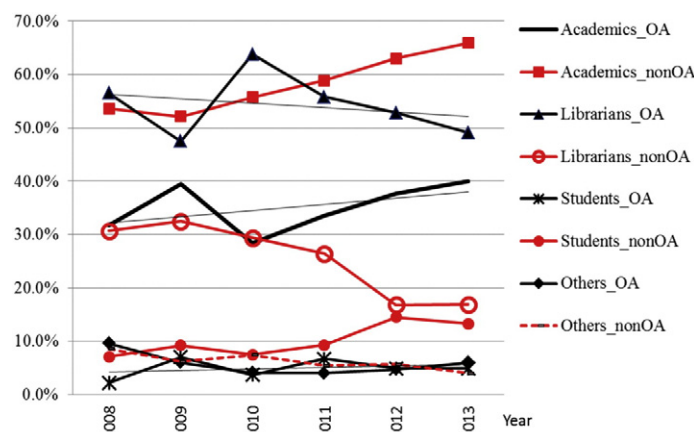

Fig. 1. Changes in the annual percentages of authors by occupation.

Table 5
Comparison in proportion of LIS authors between OA and non-OA journals.

Discipline	Occupation	OA journals		Non-OA journals	
		No. authors	%	No. authors	%
LIS	Librarians	1856	53.9	813	25.5
	Academics	537	15.5	1014	31.8
	Students	76	2.2	172	5.4
	Others	26	0.8	51	1.6
Total		2495	72.4	2050	64.3
nonLIS	Academics	691	20.1	837	26.3
	Students	98	2.8	155	4.9
	Others	162	4.7	144	4.5
Total		951	27.6	1136	35.7

Table 6
Authorship pattern for OA and non-OA journals.

No. authors per article	OA journals		Non-OA journals	
	No. articles	%	No. articles	%
1	824	45.6	779	46.8
2	585	32.4	507	30.5
3	260	14.4	246	14.8
4	86	4.8	81	4.9
5	24	1.3	27	1.6
6	12	0.7	10	0.6
7	5	0.3	7	0.4
8	10	0.6	5	0.3
11	0	0.0	1	0.1
16	1	0.1	1	0.1
20	0	0.0	1	0.1
Total	1807	100.0	1665	100.0

authors, even though academics are the primary non-LIS authors in OA and non-OA journals, the percentage of academics in non-OA journals is higher than that in OA journals. LIS author publication in OA journals increased each year (Fig. 2). A downward trend was observed in the annual percentage of LIS authors publishing in non-OA journals. LIS authors were confirmed to be the leading authors for OA journals.

5.3. Authorship pattern trends

Table 6 compares the authorship pattern between OA and non-OA journals. The number of authors per article in OA journals ranged from 1 to 16, and the number in non-OA journals ranged from 1 to 20. Similar patterns of author distributions were found in OA and non-OA journals. Approximately 53.2% of non-OA journal articles and 54.4% of OA journal articles were coauthored. Single-authored articles in both OA and non-OA journals showed a decrease (Fig. 3). Opposite trends were displayed in two-author and three-author articles in OA and non-OA journals.

5.4. Type of collaboration

Table 7 compares the distribution of the 10 types of collaboration generated from coauthored articles between OA and non-OA journals. For coauthored articles in OA journals, three primary types of collaboration were identified. Librarian–librarian collaboration dominated (38.6%), followed by librarian–academic collaboration (20.5%), and academic–academic collaboration (18.0%). In non-OA journals, coauthorship mostly displayed four types of collaboration. Academic–academic collaboration accounted for the largest percentage (34.1%), followed by academic–student collaboration (21.5%), librarian–librarian collaboration (15.5%), and librarian–academic collaboration (13.2%). Large discrepancies in the percentages of the first two types of collaboration were identified between OA and non-OA journals. Most coauthored articles in non-OA journals were the result of
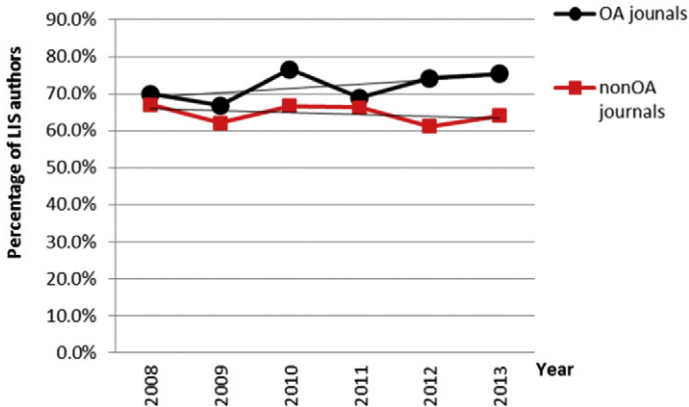
collaborations involving at least one academic, whereas those in OA journals were mostly the result of librarian-oriented collaborations.

Figs. 4 and 5 show the trends for each type of collaboration in OA and non-OA journals. Although librarian–librarian collaboration was dominant in OA journals between 2008 and 2013, a decrease in this type of collaboration, with large fluctuations, was observed. Among the 10 types of collaboration, the largest growth trend was observed in academic–academic collaboration. In the case of non-OA journals, two types of collaboration, academic–student and academic–other collaborations, had larger fluctuations than those in OA journals. The academic–academic collaboration dominated non-OA journal authorship and appeared to be increasing. The same trend was identified in academic–student collaboration. However, librarian–librarian collaboration had a downward trend in non-OA journals.

6. Discussion

Academics are accustomed to publishing their research results in traditional non-OA journals that are regarded as prestigious dissemination channels (Mammo & Ngulube, 2015; Nicholas et al., 2005; Peekhaus & Proferes, 2015). Among numerous factors influencing authors' journal choice, career advancement is valued the most (Hendricks, 2010; Research Information Network, 2009). Criteria used in academia to evaluate scholarly performance strongly affect academics' preference for scholarly communication channels. Generally, the perceived quality of publications is most critical for performance evaluation. High quality journals are thus prioritized by authors publishing research results. Most prestigious journals have established their reputations for high quality publications over a long period. New OA journals require more time to build their reputations. For example, the
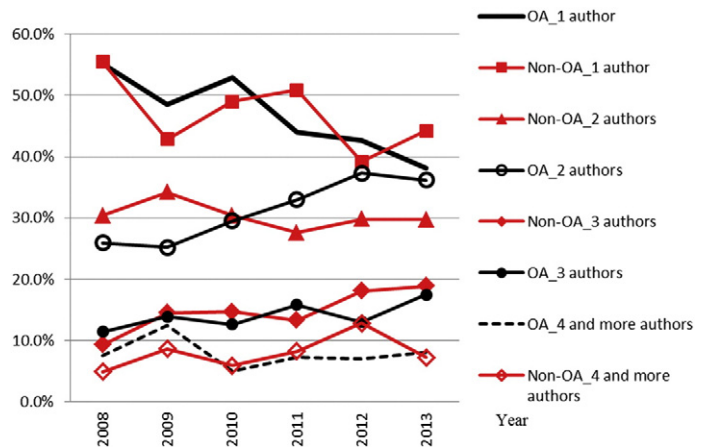

Fig. 2. Trends in proportion of LIS authors for OA and non-OA journals.

Fig. 3. Changes in authorship pattern between OA and non-OA journals.

Table 7
Types of collaboration.

Types of collaboration	OA journals		Non-OA journals	
	No. of articles	%	No. of articles	%
Librarian-librarian	379	38.6	137	15.5
Librarian-academic	202	20.5	117	13.2
Academic-academic	177	18.0	302	34.1
Academic-student	70	7.1	191	21.5
Librarian-other	51	5.2	20	2.3
Academic-other	49	5.0	73	8.2
Librarian-academic-other	31	3.2	6	0.7
Other	10	1.0	18	2.0
Librarian-academic-student	9	0.9	6	0.7
Academic-student-other	5	0.5	16	1.8
Total	983	100.0	886	100.0

Fig. 5. Changes in annual percentages of type of collaboration in non-OA journals.

journals indexed by Web of Science (WoS) database are often regarded as essential international journals across disciplines. This indicates that WoS is a convenient tool for researchers to identify prestigious international journals. OA journals are in the minority in WoS (Björk et al., 2010). Their less established reputations may be one possible reason why some researchers regard the quality of OA journals as lower than that of non-OA journals.

The findings confirm the general assumption that academics are the largest group of authors in LIS, followed closely by librarians. However, this study does demonstrate that librarians are influential LIS authors as well. Academics have the strongest motivation to publish scholarly articles because this activity is most closely connected to their career paths. Some academic librarians and graduate students also participate in research and publication because their requirements are similar to those of researchers (Hatch & Skipper, 2016; Hosburgh, 2011).

Taken together, academics and librarians accounted for approximately 86.6% of authors in the OA and non-OA journals. However, major differences in the number of authors in primary author groups were revealed between OA and non-OA journals. Academics tend to publish articles in traditional non-OA journals. The percentage of academic authors publishing in non-OA journals was more than twice that of librarians. This finding is inconsistent with some early studies of non-OA journals (Olsgaard & Olsgaard, 1980; Watson, 1985; Winston & Williams, 2003). A converse result was found in OA journals, for which librarians were the primary authors. The percentage of librarian authors publishing in OA journals was 1.5 times that of academics. The large number of librarians publishing in OA journals may be attributable to the nature of journals selected for analysis. Some researchers have suggested that academics are interested in research-oriented journals, whereas librarians prefer practice-oriented journals (Schlögl & Stock, 2008). In addition to evaluation by researchers and practitioners (Nisonger & Davis, 2005), author type has been used as an indicator to divide journals into two broad categories: practice-oriented and
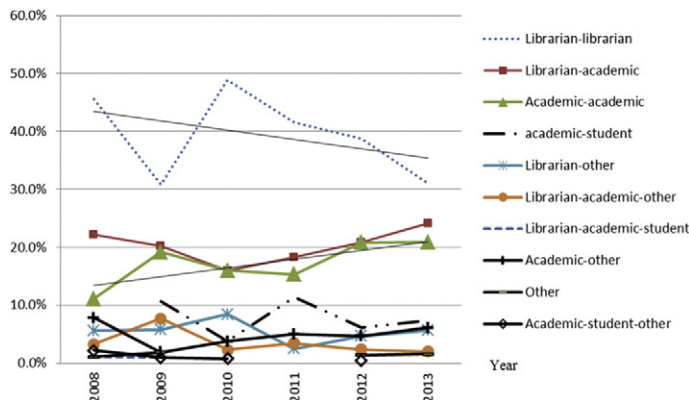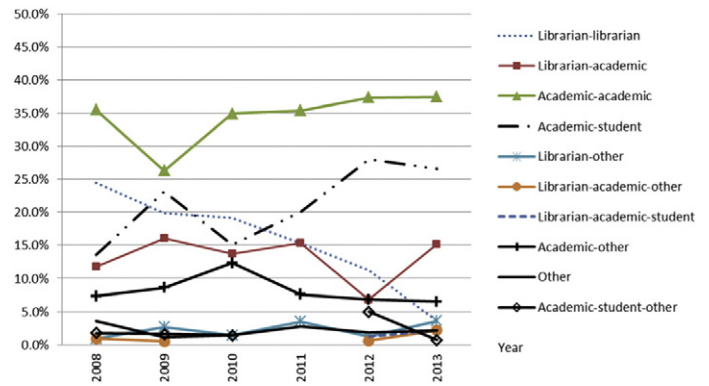
research-oriented journals (Finlay et al., 2013). Based on author type, the OA journals under study would be considered practice-oriented, and the non-OA journals theory-oriented. However, this issue must be explored further, to verify the orientation of content in OA and non-OA journals. The support librarians give to the OA movement may encourage them to share their research and experiences in OA journals, but this assumption must be explored, as authors' decisions to submit manuscripts are affected by numerous factors (Dalton, 2013; Nariani & Fernandez, 2012).

During the early development of OA journals, researchers worried about quality control because some OA journals were not peer reviewed. Even though many OA journals are now peer reviewed, traditional non-OA journals are still considered more prestigious (Mammo & Ngulube, 2015). However, peer review does not guarantee quality control and other requirements may have a greater influence on academics with regard to journal selection. Researchers' preferences for traditional journals are affected by the perception that OA publications are not widely accepted in a reward system (Creaser, 2010; Mullen, 2010). Although the majority of researchers are aware of OA journals, some still question their quality (Creaser, 2010; Xia, 2010). All of these issues mean that traditional non-OA journals are more widely selected by academics for their publications. The findings of the present study show an annual increase in the percentage of academics publishing in both non-OA and OA journals, suggesting that academics have begun to view OA journals more favorably. Peekhaus and Proferes (2015) determined that OA publishing experiences increase the willingness of researchers to continue to publish in OA journals.

Similar authorship patterns were found in both OA and non-OA journals. Approximately half of the articles in these journals were coauthored. Although single-author articles accounted for the largest proportion of articles in OA and non-OA journals, single authorship appears to be on the wane, and both OA and non-OA authors increasingly publish articles with other authors. A slightly downward trend was observed in librarian–academic collaboration in non-OA journal articles, which is consistent with other studies (Norelli & Harper, 2013; Watson, 1985; Winston & Williams, 2003). The findings of the present study generally indicate that the practitioner–academic divide is narrower in OA journals than in non-OA journals.

6.1. Limitations

One limitation of this research is that detailed author data were not available for numerous journal articles. The lack of specific job titles in author affiliation is likely to be more common for articles OA journals than for academics and non-OA journals, which could affect the results. Furthermore, the selection of candidates for LIS OA journals relied on the DOAJ, a widely used database of OA journals for OA-related studies. Because the DOAJ lists gold OA journals and does not contain green and hybrid OA journals, only gold OA journals were selected in this study, and

Fig. 4. Changes in annual percentages of type of collaboration in OA journals.

this does not present a complete picture of OA publication. Finally, LIS authors (both librarians and academics) might be expected to be more informed about OA as a concept and a choice, and their publication patterns might be influenced by a deeper knowledge of scholarly communication options.

7. Conclusion

This study contributes to the understanding of differences between authors in OA and non-OA journals in the LIS field from 2008 to 2013. The findings confirm that traditional scholarly communication has not faced obvious threats from OA publishing. Although OA journals have provided academic authors with additional options to disseminate their findings, and the visibility of their publications can be improved through the Internet, developments in OA publishing have had little effect on most academic authors' loyalty to traditional journals. In fact, new OA journals have difficulty competing with traditional journals. New OA journals require more time to establish their reputations and to attract more researchers to submit their manuscripts for publication. However, even though non-OA journals still dominate scholarly communication, there have been some changes in author characteristics during the time period under study. It is still generally true that practical discussions are more often found in OA journals, and the latest research topics and ideas will appear in non-OA journals. However, changes in authorship characteristics may cause shifts in this balance, and it is important to continue to monitor authorship trends to gain the most complete picture of scholarly communication in a discipline.

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Yu-Wei Chang is an associate professor in the Department of Library & Information Science at National Taiwan University. She received her PhD from the Department of Library & Information Science at National Taiwan University. Her research interests include bibliometrics, information behaviors, and archival studies. She has published in *Information Processing and Management, Journal of Information Science, Journal of the Association of Information Science and Technology*, and *Scientometrics*.