

Reading practices in scholarly work: from articles and books to blogs

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Abstract

- *Purpose*

The purpose of this study is to examine the role of reading in scholarly work among academics in Finland. This study analyses readings from a variety of publication types including books, conference proceedings, research reports, magazines, newspapers, blogs, non-fiction, and fiction.

- *Design*

An online survey was developed and distributed in Finland in 2016-2017 (n=528). Participants were asked their finding and use of scholarly information resources of all types.

- *Findings*

Scholars read from a variety of publications. Different types of publications are read and used differently. Reading also varies between disciplines, ranks, work responsibilities, and type of research performed.

- *Research limitations*

The study was a nationwide study of researchers in Finland, therefore all findings are within the context of researchers in a single country. All results are self-reported, therefore we assume but cannot be sure that respondents accurately recollect the specifics of their use of scholarly information.

- *Practical implications*

The results of this study are relevant to publishers, research librarians, editors, and others who serve consumers of scholarly information resources, design information products and services for those scholars, and seek to better understand the information needs and use of a variety of types of scholarly publications.

- *Originality/value*

This study replicates previous studies in a variety of countries and provides a more up-to-date and single-country contextualized overview of how researchers find and use scholarly information in their work.

Keywords: Information behaviour, Scholarly reading, Scholarly communication

Classification: Research paper

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Introduction

It can be almost taken for granted that academics – faculty members, graduate students, and other researchers and scholars – use scholarly publications to inform their work. However, their work is not monolithic. Scholars need information for a wide variety of purposes, including research, teaching, administration, and keeping informed. Furthermore, sources are not the same—articles, books, blogs, reports – and may be used for different purposes. Therefore, scholarship is not homogenous—researchers in different disciplines or with different responsibilities read and use information sources in different ways.

The study reported here looks in-depth at reading patterns from the variety of sources that scholars in Finland use for their work and variations in their reading patterns based on such things as type of resources, subject discipline, work responsibilities, type of research, and scholars' rank. Our overall research question is: What is the role of different types of publications in scholarly work?

The article is divided into two parts. Part one examines the self-reported number of readings each month of a variety of types of publications and focuses on the readers themselves by examining:

- How much do scholars read monthly for their work from a variety of types of publications?
- How important do scholars rank the reading of different types of publications for their work?

Part two examines the critical incidents of specific readings of a wide variety of types of resources to examine how individual readings and reading practices may vary. We examine how reading different types of publications differs by:

- Purpose of readings
- Importance of readings
- Thoroughness of readings
- Citing practices
- Original and re-reading
- Source of readings
- Format of readings
- Where reading took place

- Age of readings (when the publications were published), and,
- In what language the publications were written

In both sections of the article, variations between disciplines, work responsibilities (i.e., research focused vs teaching focused), type of research performed (i.e., basic and applied research), and scholars' status (rank) are studied.

Taken together, parts one and two provide a detailed picture of how much and what scholars read for work and how those reading patterns may vary by the characteristics of the readers and the purposes of the readings. The results of this study are relevant to publishers, research librarians, editors, and others who serve consumers of scholarly information resources, design information products and services for those scholars, and seek to better understand the information needs and use of a variety of types of scholarly publications by scholars.

Related research

This study builds on a long tradition of scholarly information use research. Donald W. King and, later, Carol Tenopir and Donald W. King, have studied scholarly article reading patterns since the 1970s (e.g., King et al., 1981; Belefant-Miller and King, 2001; Tenopir and King, 2000; Tenopir and King, 2004; Tenopir et al., 2009a; Tenopir et al., 2010; Tenopir et al., 2015). Many other studies such as Jamali et al. (2005) and Rowlands (2007) have focused on the use of e-journals as well. In Finland, several studies examined how scholars use e-journals in their work (Talja and Maula, 2003; Vakkari and Talja, 2005; Vakkari, 2006; Vakkari and Talja, 2006; Talja et al., 2007; Tenopir et al., 2010). This study continues those research traditions and expands it beyond journal articles.

Earlier studies have consistently found that journal articles are the most frequently used information source in academics' scholarly work, but other resources such as books or book chapters and websites are also used for research (Tenopir et al., 2015). Scholars in a 2012 study in the US reported an average of 21 journal article readings per month, with significant variations between disciplinary groups (Tenopir et al., 2015). In a similar earlier study in the U.K., academics reported reading an average of 22 journal article readings per month (Tenopir et al., 2012).

By 2012 more than three-quarters of article readings were obtained from an electronic source, yet only about half (51.5%) were read on a computer screen and about one quarter (28%) were printed for reading. About half of the article readings overall were obtained from the library collections, with almost all of these being from e-journal collections, yet very few readings actually took place in the library. Personal subscriptions have been steadily declining since 1977, while readings from library e-collections have increased. (Tenopir et al., 2015).

Readers favor current readings, but there are differences as well. More than half (54.9%) of article readings in 2012 were published less than two years ago, with significant disciplinary differences in the age of read articles. Humanists read more articles published more than five years ago compared to other disciplinary groups (Tenopir et al., 2015). Earlier studies have shown that scholars tend to cite current articles more often (Guthrie, 2000; Odlyzko, 2002; Herman, 2004).

Journal articles are not the only source for scholarly readings. Monographs and edited books are important publishing forums for humanists and social scientists, as are conference proceedings for engineers/technical scientists (e.g. Piro et al., 2013), which also explains the disciplinary differences in the number of article

readings. Late (2018) in her study focusing on scholarly reading practices identified three reading orientations including academic, professional, and factual. Study showed that in addition to academic publications scholars read actively newspapers, professional magazines, and research reports.

In the U.K., in addition to the average of 22 journal article readings per month, scholars reported seven book readings and 10 “other publication” readings (including technical or government reports, articles in trade journals, conference proceedings, blogs, and Web sites) (Tenopir et al., 2012). In general, humanists reported more readings from books compared to scholars in other disciplines, while social scientists reported more other publication readings. Books were found most often by other persons (28.1%) and by searching (23.4%). Only about one-fifth of book readings were obtained from the library collections, while almost 40% were from personal collections. Niu and Hemminger (2012) found that engineers reported using more conference materials and conference proceedings as compared with natural scientists.

The nature of scholars’ work may also influence on reading practices. Article reading is connected especially to research work. Respondents who spend more than half of their work time on research and writing read more articles. Respondents who used most of their work time for teaching read more books than did those who spent less than half of their time on teaching (Tenopir et al., 2012).

Reading habits are influenced by the practices typical of the discipline but also by the researcher’s personal characteristics. It has been noted that some researchers read a large amount while others do not. Those reading in large amounts are called ‘stars’ or ‘gatekeepers’ of the organizations. Stars may read twice as much as the average readers and pass on the information they have gained (Meadows, 1974; King and Tenopir, 1999). For a number of studies, there was a correlation between reading and publishing (Tenopir et al., 2012; King et al., 2009; Tenopir et al., 2009b). In general, successful scholars, those who publish more or who have earned an award in the past two years, read more scholarly articles. Reading inspired new ideas and thinking and improved research results.

Some reading patterns are changing. A recent study in Finland examined the changes of scholarly reading over a decade (Late et al., 2018). Scholars are using a wide variety of sources to access scholarly articles. Particularly, the use of social media as a source is growing. Another Finnish study found that while, scholars still rely on journal articles and books for research, they are obtaining them through varies avenues (Tenopir et al., 2018). The library no long has a monopoly on scholarly information. It has also been noted that scholars do not cite most of the publications they read; thus citations reveal only a fraction what scholars have read. (Tenopir et al., 2012).

Scholars read more than scholarly journals, books, or reports for their work. For example, The New York Times was cited six thousand times in academic papers in 2010 (Hicks and Wang, 2013). In order to follow societal issues and obtain the latest information provided through practitioners, politicians, and the lay public, scholars need to read from a variety of types of publications and channels.

Yet, there has been a lack of studies taking into account different types of general publications such as newspapers, professional magazines, non-fiction, fiction or blogs. This study aims to fill this gap by offering more holistic view to scholars’ reading practices.

Methods and data

This study used an online survey distributed from October through mid-December 2016 throughout Finland to collect data on reading characteristics of Finnish scholars. The Finnish National Library’s FinELib consortia

asked its member libraries to distribute the questionnaire to their respective faculty members, doctoral students, and other researchers, although we do not know how many complied with this request. After reviewing the initial responses and comparing with the subject discipline characteristics of our total population (see Table 1), we found that respondents from the natural sciences were under-represented. For this reason, we also distributed 1000 invitations to the survey directly, targeting natural scientists and other under-represented groups. In the end, a total of 528 scholars working in Finnish universities, universities of applied sciences, state research institutes or other research institutes responded to the survey.

The subject disciplines were considered close enough to the target population to proceed with analysis (Table 1); although it should be noted that scholars who work at state research institutes are over-represented in the survey results and university scholars are under-represented (Table 2.) The greatest difference between universities and state research institutes in Finland is that formal teaching duties are most often limited at research institutes. Doctoral students make up about 22% of the respondents, with lecturers making up 21%. The remaining respondents include project researchers (17 %), post-doctoral researchers (16%), professors (15%), and directors and project managers (9%).

Because the Human Subjects permission from the Institutional Review Board at the University of Tennessee required that respondents be allowed to skip any question, the response rate varies from question to question, with all analysis done on the number of respondents for a particular question.

Table 1. Representativeness of different disciplines in the data

Disciplinary group	Total population	%	Survey	%
sciencesS	6729	26.5	154	29.5
Engineering/Technical sciences	5358	21.1	80	15.3
Medical sciences	3816	15.0	90	17.2
Social sciences	6489	25.5	158	30.3
Humanities	2655	10.4	40	7.7
Total	25428		522	

Table 2. Representativeness of different research sectors in the data

Sector	Total population	%	Survey respondents	%
University	18594	73.1	303	57.5
State research institute	4005	15.8	122	23.2
University of applied sciences	2829	11.1	69	13.1
Other	na	na	33	6.3
Total	25428		527	

The survey instrument was built on the Qualtrics platform at the University of Tennessee and all analysis was done using SPSS. This paper focuses on the differences of reading patterns of different types of sources; other papers from this project focus on other aspects, such as the value of article and book readings, actual and anticipated changes over time, and an in-depth look at journal article readings and how journals should change in the future (Late et al., 2018; Tenopir et al., 2018). (See Tenopir et al., 2017 for the full questionnaire.)

Part one of this paper focuses on recollection questions, which asked all respondents to estimate how many different types of resources they had read for work-related purposes in the last month. Reading was defined

as going beyond the title, table of contents, and/or abstract into the body of the work, so what we count as a “reading” may vary from skimming to reading in-depth. We also asked the respondents to evaluate the importance of reading of different publication types for their work.

Part two focuses on the critical incident of the last reading. They were asked to respond to a series of specific questions about their last reading of the specified type of resource, including how they located it, where they read it, how they used it, etc. All respondents were asked critical incident questions for the last journal article reading, but for the other types of resources they were asked the questions only for the type of other resource that they have read most recently. Therefore, the numbers of responses for critical incident questions for types other than journals are from just a subset of respondents.

In both sections variables were analysed for differences based on characteristics of the respondents such as subject discipline, work responsibilities, type of research performed, and rank. Appropriate statistical methods were used to examine differences between groups. Chi² testing is used when one is measuring significance in the relationship between two nominal variables. T-test and One way ANOVA were used for comparing means between two or more groups. Post hoc testing (Tamhane testing, in particular) was used to study the statistical differences between more than two groups.

Limitations

This study focuses on scholarly readings and readers from Finland only, a country with a population of 5.5 million and one of the highest literacy rates in the world (Alvermann and Harrison, 2017; Miller and McKenna, 2016). The FinELib consortia negotiates e-journal and e-book licenses country-wide, so researchers have easy access to a wide variety of publications. A majority of the scholarly journal publications are in English, although many resources (especially non-journals) are available in Finnish, Swedish, and other languages. We believe that results from Finland are generalizable because researchers in Finland read and speak many different languages, publish scholarly works often in international English-language venues, and are fully part of the European and international community of scholarship.

Although we cannot calculate an exact response rate, because we do not know how many invitations actually were sent by the libraries to their researchers or how many reached potential respondents, we do know that out of a total potential population of over 25,000 scholars, we received responses from only 528. We asked all respondents about their estimated amount of monthly reading and about the critical incident of the last article reading, but for critical incident of other types of resources we asked only once per respondent—that is about the last type of reading other than articles. The number of responses to the critical incident questions for types of readings other than journal articles is therefore too small to study demographic differences in depth.

Responses are self-reported and we assume that respondents are telling us the truth to the best of their recollection and are focusing responses on work-related readings, as specified in the instructions. Numbers of readings of any type of resource should therefore be considered estimates based on the recollection of the respondents. Since critical incident questions about the last reading for all types of resources other than articles were asked only of those for whom the type of resource was their last reading, numbers are small. In addition, those who tend to read more of each type are more likely to have read that type most recently (humanities scholars and books, for example), so reading patterns for those type of resources may be biased towards those who read them more often.

Results

Number of readings

Scholars were asked to give the approximate number of readings from different types of publications they had read during the last month (30 days) for work. Publication types were categorized as journal articles, scholarly books/book chapters, conference proceedings/research reports, newspaper articles, magazines or trade journal articles, blog writings, and other types of non-fiction or fiction books. Reading was defined as going beyond the table of contents, title, and abstract to the body of the work. A book reading may include just reading a portion of the book such as skimming or reading a chapter. The reading may be a first time reading from each resource or a re-reading.

Two messages are clear—1) scholars report reading a lot from a wide variety of resources, but 2) there is wide variation in the amount and types of reading. After reporting on overall averages, therefore, we examine demographic differences. In the past month scholars report they read from a variety of types of publications for work—in total from all types of publications an average a total of 59 readings. (Table 3). If we assume all months are equal, this totals 708 publication readings during one year (12 months) or, assuming vacation time with less reading, 649 during an 11 month year.

As can be seen in Table 3, there is a wide variation in amounts of reading. For example, the mean across all disciplines for scholarly article readings is 20, with a median of 10, mode 10, min 0, max 250. More than half (52.4 %) of all scholars say they read only 1-10 articles per month, while about a quarter (23.7 %) read 11-20 articles and 22.3 % more than 20 articles.

During the last month scholars report reading on average from three scholarly books or book chapters. As with articles, however, there is great variation with 37% of respondents reporting they did not read from any books or book chapters during the past month.

On average, scholars report reading five conference papers or research reports during one month, yet a quarter (24%) of respondents did not read any conference papers or research reports during the last month and about half (49%) read 0-2 papers/reports.

The standard deviation was the greatest with newspaper/news site article readings, so outliers over 100 readings were excluded. With outliers excluded, the average number of read articles in newspapers/news sites during the past month was 17 (with outliers mean=46,56, median=6, mode=0, sd=148,6). One half of the scholars read 1-10 newspaper articles within one month. However, more than one fourth of scholars read more than 20 articles during one month.

In addition, scholars report they read on average nine magazine or trade journal articles, four blog readings, and two other non-fiction or fiction books per month. However, almost half did not read any non-fiction/fiction during the month.

Table 3. Number of read publications in the past month by publication type

	Journal articles (N=456)	Scholarly books (N=368)	Conference proceedings/ research reports (N=361)	Newspaper articles (N=376) ¹	Magazine articles (N=390)	Blogs (N=376)	Non-fiction/fiction (N=352)
Mean	19.7	2.9	4.8	17.3	8.6	4.3	1.8
Median	10	1	3	5	3	2	1
SD	28.3	5.5	9.0	26.7	16.6	11.7	3.0
0	1.5 %	37 %	24.1 %	18.4 %	26.4 %	39.4 %	48.6 %
1-10	52.4 %	58.9 %	66.8 %	50.0 %	55.7 %	53.4 %	44.1 %
11-20	25.2 %	3 %	6.3 %	10.9 %	10.0 %	4.5 %	7.3 %
More	20.9 %	1.1 %	2.8 %	20.7 %	7.9 %	2.7 %	0 %

Demographic differences

We examined the various demographic characteristics to try to understand why variations are so great. Disciplinary differences (table 4) in the average number of read scholarly books (ANOVA $F=7,538$, sig. ,000), and non-fiction/fiction (ANOVA $F=4,969$, sig. ,001) are statistically significant.

The average number of all book readings was highest for those representing humanities and social sciences and the lowest in sciences and medical sciences. Concerning scholarly books the difference is significant between humanities and sciences and medical sciences (Tamhane sig. ,008, sig. ,018) and social sciences and sciences (Tamhane ,000). Humanities and social science readers read significantly more non-fiction/fiction books than medical sciences readers (Tamhane sig. \leq ,013)

Although the difference between disciplines in the number of journal article readings is not significant according to statistical tests (ANOVA df 4 F 2,243, sig. ,064) the data shows that the average number of journal article readings was highest for those representing the hard sciences, such as sciences, engineering, and medical sciences. The number of article readings was lowest in the humanities (difference is significant compared to all other disciplines, tamhane $p<,01$) where the average scholar engaged only eight article readings during one month.

Although engineers reported more conference proceedings/research report readings and fewer newspaper readings compared to scholars in other disciplines, the average number of magazine/trade journal article readings was highest in social sciences and for conference proceedings/research reports, newspapers, and magazines/blogs the disciplinary differences were not statistically significant.

¹ Outliers over 100 newspaper article readings were removed from the analyses because of high SD.

Table 4. Number of read publications in the past month by publication type and discipline

	Journal articles	Scholarly books **	Conference proceedings/ research reports	Newspaper articles	Magazine article	Blogs	Non-fiction/fiction**	Total
Sciences (N=72-111)	23.0	1.5	4.7	19.8	7.2	3.1	1.6	60.9
Medical sciences (N=47-80)	21.5	1.9	2.7	18.6	9.2	2.5	0.9	57.3
Engineering/technical sciences (N=69-100)	21.9	3.1	6.7	14.2	7.6	5.0	1.5	60
Social sciences (N=75-125)	17.4	3.2	4.7	16.4	11.1	5.4	2.3	60.5
Humanities (N=12-34)	7.9	7.6	2.9	21.5	7.1	7.5	3.8	58.3
Total (N=275-450)	19.8	2.9	4.7	17.4	8.7	4.3	1.8	59.6

**difference significant $p \leq .001$

Although discipline seems to account for some of the differences, it does not account for all. We also examined variations in amount of readings by the work focus of the readers—that is, do scholars who are research intensive (defined as spending more than 50% of their work time on research) differ in their reading from scholars who spend more time on teaching and/or administrative tasks (more than 50% of their work time on teaching and/or administration)? For some types of resources, there are significant differences (table 5). Research intensive scholars read significantly more journal articles compared to teaching/administration intensive ($t=-5.090$, $df=420.173$, $sig. 0.00$). On the other hand, teaching/administration scholars read more non-fiction/fiction compared to research intensive ($t=2.622$, $df=327$, $sig. .009$).

Table 5. Number of read publications in the past month by work tasks

	Journal articles**	Scholarly books	Conference proceedings/ research reports	Newspaper articles	Magazine articles	Blogs	Non-fiction/fiction*
Research intensive (N=211-317)	22.2	2.9	4.6	18.5	8.6	4.4	1.5
Teaching/administration intensive (N=52-112)	11.9	2.4	4.9	14.4	8.6	4.4	2.5

**difference significant $p \leq .000$, *difference significant $p \leq .009$

The nature of research also has an influence on what and how much scholars read (table 6). On average, those focusing on basic research read more journal articles ($t= 2.120$, $df= 438$, $sig= 0.035$), while those focusing on applied research read significantly more magazine/trade journal articles ($t=-2.094$, $df= 375$, $sig. .037$).

Table 6. Number of read publications in the past month by nature of research

	Journal articles**	Scholarly books	Conference proceedings/ research reports	Newspaper articles	Magazine articles*	Blogs	Nonfiction/ fiction
Basic research (N=130-205)	23.2	3.3	4.5	17.0	6.6	4.7	1.7
Applied research (N=144-236)	17.3	2.5	5	17.5	10.0	4.2	1.8

**difference is significant p=.035, * difference is significant p= .037

Number of journal article readings varies also between scholars with different status (ANOVA F=3.622, sig=.003). Professors and doctoral students read more journal articles compared to scholars on other positions (table 7). Directors, on the other hand, read significantly less journal articles compared to professors, post docs, and doctoral students (Tamhane sig. ≤ .05).

Table 7. Number of read publications in the past month by scholar's status

	Journal articles**	Scholarly books	Conference proceedings/ research reports	Newspaper articles	Magazine articles	Blogs	Nonfiction/ fiction
Director, manager (N=25-43)	11.1	2.3	6.1	17.95	6.4	3.2	1.7
Professor (n=48-68)	27.3	3.5	5.2	20.2	11.0	3.4	2.3
Post doc researcher (N=61-74)	20.9	3.7	6.2	18.5	7.6	4.5	2.1
Doctoral student (n=82-99)	25.2	3.0	3.0	12.7	5.7	5.0	1.2
Lecturer (n=71-92)	13.3	2.3	4.6	18.1	10.6	5.6	2.4
Researcher (n=58-75)	17.6	2.3	5.2	16.3	9.5	3.2	1.9

**F=3.622, sig=.003

Importance of different publication types to work

We also asked scholars to evaluate the importance of reading of different type of publications to their work in a five point scale (1=not important at all, 5=absolutely essential). In general, reading of scholarly journals (M=4.6) and article compilations (M=4.0) was evaluated as most important (Table 8). Reading academic monographs, conference proceedings and research reports, professional magazines, and text books was evaluated as somewhat equally important (M≥3.0). Reading of more general publishing forums, such as

newspapers, other internet resources, social media, popular science books and fiction was evaluated less important for work ($M < 3$).

Table 8. Importance of different publication forums

	MEAN
SCHOLARLY JOURNALS N=450	4.6
ARTICLE COMPILATIONS N=414	4.0
ACADEMIC MONOGRAPHS N=416	3.1
CONFERENCE PROCEEDINGS N=448	3.1
RESEARCH REPORTS N=438	3.3
PROFESSIONAL MAGAZINES N=445	3.0
NEWSPAPERS N=450	2.7
SOCIAL MEDIA N=431	2.1
OTHER INTERNET RESOURCES N=429	2.9
TEXT BOOKS N=449	3.0
POPULAR SCIENCE BOOKS N=430	2.6
FICTION N=424	1.8

The importance of reading different publication types varies significantly between disciplines, work responsibilities, type of research performed, and ranks.

Although reading scholarly journal articles were ranked as most important in every discipline, medical scientists rank journals as more important (ANOVA 3.344, sig. .009). Also, article compilations were ranked most highly by scholars in medical sciences and humanities (ANOVA 2.562, sig. .038). Scientific monographs (ANOVA 14.004, sig. .000) and social media (ANOVA 5.901, sig. .000) were ranked most highly in social sciences and humanities. Social scientists ranked also newspapers (ANOVA 7.012, sig. .000) and non-fiction (ANOVA 3.354, sig. .010) as more important compared to scholars in other disciplines. Fiction was most valued in the humanities (ANOVA 13.624, sig. .000). Engineers ranked conference proceedings (ANOVA 6.105, sig. .000) as more important compared to others. In addition, scholars in the sciences valued text books the most (ANOVA 3.869, sig. .000).

Research intensive scholars ranked journals (t-test -3.134, sig. =.002) and article compilations (t-test -2.342, sig. .020) as more important compared to teaching intensive. On the other hand, teaching intensive scholars ranked professional magazines (t-test 2.825 sig. .005), newspapers (t-test, 2.891 sig. .003), social media (t-

test 3.354 sig. .001), textbooks (t-test 3.524 sig. .001), non-fiction (t-test 4.336 sig. .000), and fiction (t-test 3.830 sig. .000) as more important than research intensive scholars.

Scholars focusing on basic research ranked scholarly journals (t-test 5.641, sig. .000), article compilations (t-test 2.839, sig. .005), and scholarly monographs (t-test 2.294, sig. .022) as more important compared to those focusing on applied research. Scholars focusing on applied research saw conference proceedings (t-test -2.018 sig. .044), research reports (t-test -3.523, sig. .000), professional magazines (t-test 3.900, sig. .000), and internet resources (t-test -.2387, sig. .017) as more important compared to scholars focusing on basic research.

Professors ranked scholarly journals (ANOVA 12.159 sig. .000), monographs (ANOVA 3.702, sig. .003) and fiction (ANOVA sig. .000) more important compared to scholars in other positions. Also doctoral students and post doc researchers ranked journals as highly as did professors. Directors and lecturers on the other hand ranked professional magazines (ANOVA 6.884, sig. .000) and newspapers (ANOVA 5.049, sig. .000) more important compared to scholars with other status. In addition, directors ranked research reports (ANOVA 3.779, sig. .002) more important compared to others. Lecturers ranked textbooks (ANOVA 5.843, sig. .000) and non-fiction (ANOVA 5.909, sig. .000) as most important.

Profile of latest readings

After answering recollection questions about the amount of reading of various types of resources, all respondents were asked to answer many specific questions focusing on their last scholarly article reading. These questions get to purpose, value, and outcomes of readings in addition to revealing detailed patterns about how they discover, get access to, and read scholarly articles. After the scholarly article reading questions, which were asked of everyone, the next section of the questionnaire asked respondents to answer similar critical incident questions about their latest reading of another type of publication. Since all were asked about article readings, but respondents self-selected other types of readings, the number of responses varies as follows by type of resource:

- 454 article readings
- 95 Scholarly book/book chapter readings
- 94 Conference proceedings/research report readings
- 70 newspaper article readings
- 58 Magazine/trade journal article
- 27 blog readings
- 59 non-fiction/fiction readings

Each of the incidents of reading reported in this section can be considered a second-stage sample, where the first stage are the readers and this second stage is a sample of readings from those readers. Information resources are read for many different purposes and have different outcomes, so the patterns of reading may vary from one reading to the next even from the same reader. This section, then, focuses on the patterns of readings.

Purpose of reading

Publications are read for different purposes. Scholarly publications, such as journal articles, scholarly books, and conference proceedings/research reports are read most often for research and writing (table 9), with the most common purpose for reading other types of publications being current awareness, or personal interest and pleasure.

The average purpose of scholarly article readings differ between disciplines. Among our respondents, those in the humanities (18.2% for teaching) and those in the social sciences (12.6% for teaching) report they read articles more often for teaching ($\chi^2 .024$) compared to scholars in other disciplines. However, this may be due to the fact that a higher percentage of scholars in humanities and social sciences among our respondents are categorized as teaching/administrative intensive compared to scholars representing other disciplines. We do not know if this is typical of scholars in those disciplines or merely a factor in our responses.

The nature of a scholar's work has a significant influence on the purpose of reading ($\chi^2 .000$) of scholarly articles. Those who are research intensive report they read articles more often for research and writing (77.1%) compared to those who are teaching/administrative (46.4% for research and writing). Not surprisingly, teaching intensive/administrative scholars read more often for teaching (25.9%) compared to research intensive (2.2%). Furthermore, the nature of a scholar's research has also an impact on the purpose of reading ($\chi^2 .015$). Those focusing on basic research read more for research and writing (76.7%) compared to those focusing on applied research (63.6% for research and writing).

Scholars' status has also significant influence on the purpose of reading ($\chi^2 .000$). Doctoral students (85.9%), professors (82.4%), and post doc researchers (79.2%) read more scholarly articles for research and writing compared to lecturers (42.4%), directors (65.1%), and other researchers (57.3%). Lecturers read more often for teaching (33.7%) and directors more often for current awareness (25.6%) compared to other groups.

Table 9. Purpose of readings

	Research & Writing	Teaching	Current awareness/continuing education	Interest pleasure	Other
Journal articles (N=454)	68.5	8.8	13.2	2	7.5
Scholarly books (N=94)	61.3	7.5	16.1	5.4	9.7
Conference proceedings/ research reports (N=91)	60.2	7.5	12.9	5.4	14
Newspaper article (N=65)	3	1.5	70.1	19.4	6
Magazine article (n=57)	12.3	8.8	52.6	26.3	0
Blogs (n=27)	22.2	3.7	37.0	29.6	7.4
Non-fiction / fiction (N=59)	13.6	8.5	16.9	55.9	5.1

Importance of readings

Scholars were asked to rank the importance of the article and the other publication they most recently read with the scale 1-5 (1= not at all important, 5= absolutely essential). Most of the readings were considered at least as important for work (table 10). However, journal articles, scholarly books/chapters, conference proceedings were ranked as more important for work compared to newspapers, magazine/trade journal articles, blogs, and non-fiction/fiction.

Medical scientists, and scientists ranked journal article readings as more important compared to other disciplines (ANOVA 2.673, sig. .032). Scholars in humanities and engineering ranked journal article readings as least important. Newspaper readings were ranked as more important by social scientists compared to scholars in other disciplines (ANOVA F=4.284, sig. .004). Those focusing on applied research ranked magazine article readings as more important compared to those focusing on basic research (t-test T=-2.406 sig. .021). There were no other differences in the importance of readings between disciplines, ranks, nature of work and nature of research.

Table 10. Importance of different type of readings

	MEAN (SCALE 1-5)
SCHOLARLY JOURNALS N=454	3.5
SCHOLARLY BOOKS N=93	3.5
CONFERENCE PROCEEDINGS/RESEARCH REPORTS N=92	3.5
NEWSPAPERS N=66	2.0
MAGAZINE ARTICLE N=57	2.7
BLOG N=27	2.3
NON-FICTION / FICTION N=59	2.3

The purpose of readings is connected to the importance of readings (table 11). For instance, scholarly articles (ANOVA $F=13.518$, sig. .000) and scholarly books/chapters (ANOVA $F=5.672$, sig. .000) read for research and writing were considered as more important to work.

Table 11. Importance by purpose, scale 1-5

	RESEARCH AND WRITING	TEACHING	CURRENT AWARENESS	INTEREST/ PLEASURE	OTHER
SCHOLARLY JOURNALS N=454**	3.6	3.3	2.8	2.1	3.4
SCHOLARLY BOOKS N=93**	3.8	3.4	2.7	2.6	3.3
CONFERENCE PROCEEDINGS/RESEARCH REPORTS N=92**	3.7	3.7	3.0	2.0	3.4
NEWSPAPERS N=66	3.5	1.0	2.1	1.7	1.8
MAGAZINE ARTICLE N=57**	3.3	3.0	3.0	1.6	-
BLOG N=27**	3.3	3.0	2.2	1.5	3.0
NON-FICTION / FICTION N=59**	4.1	3.8	2.8	1.3	4.0

** difference is significant $p \leq .001$

Original and re-reading

Over 70% of the reported readings were new readings (table 12), however, academic publications were somewhat more likely to be re-readings compared to other publications. Re-reading focused most typically on scholarly books/chapters of which one fourth were in fact re-readings.

Re-readings of scholarly articles (t-test 4.724, sig. .000), scholarly books/chapters (t-test -2.904, sig. .005), conference proceedings (t-test -2.726 sig. .0015) and non-fiction/fiction (t-test -4.407, sig. .001) were ranked as more important for work compared to new readings. Re-read journal articles were also more likely to be cited compared to new readings (χ^2 .000).

There was a significant difference in re-readings between the disciplines (χ^2 .002). Re-reading journal articles was most typical in medical sciences (32.5%), social sciences (27.3%), and in humanities (27.6%). Also doctoral students re-read articles (30.3%) more often compared to researchers in other positions (χ^2 .046). Nature of work or research had no influence on re-reading.

Table 12. Re-reading

	Re-reading	New-reading
Journal articles (N=454)	21.8	78.2
Scholarly books (N=94)	26.6	73.4
Conference proceedings/ research reports (N=92)	20.7	79.3
Newspaper articles (N=67)	11.9	88.1
Magazine article (n=57)	21.1	78.9
Blog (n=27)	7.4	92.6
Non-fiction / fiction (N=59)	16.9	83.1

Thoroughness of readings

Most of the readings were done with great care or at least parts of the publication were read with great care (table 13). Reading of scholarly publications such as journal articles, scholarly books, conference proceedings/research reports, and magazine articles focused more often only on the specific parts of the text that were read with great care. The fairly well-established structure of scientific publication enables researchers to identify the key components of the text, such as the outline of its contents, specific sections, figures etc. Thus, it is possible to read the publication by focusing on only to the specific sections. Journal articles (ANOVA $F=8.854$, sig. .000) and conference proceedings/research reports (ANOVA $F=5.345$, sig. .001) read with great care or parts of the article with great care were considered as more important for work compared to those read with less care.

When it comes to other publications, such as newspaper articles, blogs, and non-fiction/fiction the whole publication was read more often with great care. Especially non-fiction/fiction was read mostly with great care. Newspaper articles were more often also just skimmed compared to other publication types.

There were some differences between disciplines ($\chi^2 .046$) in reading journal articles. Scholars working in the fields of the sciences read more typically parts of the article with great care (47% reading parts with great care). In humanities scholars read more typically the whole article with great care (45.5%). There were no other significant differences in the way the publications were read between nature of work, nature of research, and status.

Table 13. How thoroughly the publication was read

	I read it with great care	I read parts of it with great care	I read with attention to the main points	I read only specific sections	I skimmed it just to get the idea
Journal articles (N=454)	30.4	39.9	19.6	7.3	2.9
Scholarly books (N=94)	28.7	44.7	16	9.6	1.1
Conference proceedings/ research reports (N=93)	28	40.9	18.3	8.6	4.3
Newspaper article (N=68)	45.6	30.9	10.3	2.9	10.3
Magazine article (N=57)	36.8	45.6	12.3	0	5.3
Blog (n=27)	55.6	29.6	14.8	0	0
Non-fiction/fiction (n=59)	76.3	15.3	1.7	6.8	0

Citing practices

Scholarly publications are more likely to be cited now and in the future compared to other publications (table 14). About one fifth of the read journal articles, scholarly books and conference proceedings/reports were already cited. Cited journal articles are more often re-read compared to not-cited (χ sig. .000) and used more often for research and writing (χ sig. .000). In addition, cited journal articles (ANOVA $F=32.908$, sig. .000), scholarly books (ANOVA $F=16.111$, sig. .000), and conference proceedings/reports (ANOVA $F=5.474$, sig. .002) were considered as more important compared to not cited (ANOVA $F=32.908$, sig. .000).

Research intensive scholars cite journal articles more often ($\chi^2 .000$) compared to teaching/administrative intensive scholars. As do doctoral students and post docs ($\chi^2 .000$). Discipline or nature of work did not influence citing significantly.

Table 14. Citing

	Already did	Will in the future	Maybe	No
Journal articles (N=453)	20.1	29.6	37.1	13.2
Scholarly books (N=93)	18.3	33.3	26.9	21.5
Conference proceedings/ research reports (N=92)	18.5	19.6	32.6	29.3
Newspapers (N=66)	0	1.5	10.6	87.9
Magazine article (n=56)	7.1	1.8	14.3	76.8
Blog (n=27)	3.7	0	11.1	85.2
Non-fiction / fiction (N=59)	3.4	6.8	25.4	64.4

Source of readings

Scholars use a variety of ways to become aware of publications. Academic publications and non-fiction/fiction were found most often by searching, from another person, or by looking from the citations (table 15). Newspaper and magazine articles and blogs were found more often by browsing and by other means for example from own collection or by own subscription. Non-fiction/fiction books are found by various ways; searching, browsing, and by other persons. One third became aware of the read non-fiction/fiction by other ways such as from own collection or from the library or from the book store.

There were some differences between scholars focusing on basic or applied research ($\chi^2 .042$) and between scholars focusing either research or teaching/administration ($\chi^2 .012$) in the ways becoming aware of the latest journal article they read. Scholars focusing on basic research became aware of the article more often by browsing (12.9%), by citations (14.9%), and by colleagues (19.3%) compared to scholars focusing on applied research who found the article more often by searching (51.7%). About 38% of scholars focusing on basic research found the article by searching. Research intensive scholars found the article more often by searching (47.1%) and by colleagues (20.4%) compared to teaching/administrative intensive (41.1% by searching and 13.4% by colleagues). Teaching/administrative intensive scholars found the article more often by browsing (17.9%) compared to research intensive (7.6% by browsing).

There were not any significant differences between scholars' status or by discipline. However, the share of scholars becoming aware of the article by searching was highest among those in medical sciences (53.2%).

Table 15. How scholars became aware of the publication

	While browsing	While searching	Cited in another publication	Another person told about it	Other way*
Journal articles (N=454)	10.8	45.6	12.1	18.1	13.3
Scholarly books (N=94)	10.6	29.8	13.8	24.5	21.3
Conference proceedings/ research reports (N=91)	15.4	34.1	7.7	36.3	6.6
Newspapers (N=68)	55.9	7.4	1.5	5.9	29.4
Magazine article (n=56)	37.5	8.9	7.1	5.4	41.1
Blog (n=27)	33.3	18.5	0	14.8	33.3
Non-fiction / fiction (N=59)	16.9	25.4	6.8	16.9	33.9

*e.g., from own collection/own subscription, journal alerts/ research social networks

Scholars (45.6%) who found the scholarly article by searching most typically used web search engines (47%) such as Google or Google Scholar or electronic indexing or abstracting services (37%) such as Academic Search Premier or Web of Sciences for searching. Using electronic indexing or abstracting services for searching was most typical in medical sciences (63.4% of medical scientists used these services when searching, difference significant at level χ^2 $p=0.016$). In other disciplines the use of web search engines was more typical. Also those focusing on basic research used more often electronic indexing or abstracting services compared to those focusing on applied research (χ^2 $p=0.025$). Nature of research and rank did not influence on the use of searching tools.

After scholars become aware of the publication, they obtained the publication from different sources (table 16). Library collections are especially important for obtaining journal articles, scholarly books/chapters and non-fiction/fiction. Almost half of the journal articles and more than 40 % of scholarly books/chapters were obtained from the library collection. Journal articles are more likely to be obtained from institutional repositories compared to other publication types. More than one fifth of scholarly books/chapters and conference proceedings were obtained from another person.

The Internet is the commonly used source for obtaining newspaper articles, magazines/blogs, conference proceedings and journal articles. However, it is likely that at least some of the journal articles and conference proceedings obtained from the internet are actually paid by the library and are part of the library collection.

Personal subscriptions/collections are used most often obtaining newspaper and magazine articles, and non-fiction/fiction. The share of academic publications obtained from personal collections/subscriptions is relatively low.

Obtaining journal articles varies between those focusing on basic and applied research (χ^2 .055) and between scholars in different positions (χ^2 .004). Scholars focusing on basic research used library collections (54.5%) more often compared to those focusing on applied research (45.3%). Also in applied research scholars obtained articles more often from repositories (17.4%) compared to those focusing on basic research (11.5%). Doctoral students obtained the article more likely from the library collections (61.6%) and lecturers from websites (31.5%) compared to scholars in other positions. There were no significant differences between disciplines or between the nature of work.

Table 16. How scholars obtained the publication

	Personal subscription/own collection	From the library collection	Institutional/subject repository	From another person	Internet	Other way
Journal articles (N=452)	2.4	49.3	15	9.7	19.7	3.8
Scholarly books (N=94)	9.6	43.6	8.5	25.5	8.5	4.3
Conference proceedings/ research reports (N=91)	1.1	20.9	11	20.9	29.7	16.5
Newspapers (N=65)	36.9	13.8	3.1	4.6	38.5	3.1
Magazine article (n=56)	42.9	26.8	5.4	7.1	17.9	0
Blog (n=27)	0	0	0	3.7	96.3	0
Non-fiction / fiction (N=59)	49.2	35.6	0.0	6.8	3.4	5.1

Reading format

More than half of the journal articles, conference proceedings, newspaper articles, and blogs were read in electronic format (table 17), while books and magazine articles are still mainly read as print.

Surprisingly, however, journal articles read as print were considered as more important for work compared to articles read on screen (t-test 3.803, df=449, sig. .000). There were no significant differences between disciplines, work responsibilities, type of research performed, or ranks in reading format.

Table 17. In what format was the publication read

	Print	Electronic
Journal articles (N=452)	45.8	54.2
Scholarly books (N=94)	74.5	25.5
Conference proceedings/ research reports (N=91)	33	67
Newspapers (N=66)	42.4	57.6
Magazine article (n=57)	71.9	28.1
Blog (n=27)	3.7	96.3
Non-fiction / fiction (N=59)	87.9	12.1

When looking at the reading format more closely, it is clear that most of the journal articles read as print are actually obtained from an electronic source and printed for reading (Table 18). Only about five percent of the journal articles were actually read from a printed journal. Scholars are most likely to print downloaded articles when the article is read with great care ($\chi^2 .000$). A high share of conference proceedings were also printed for reading. About one half of the journal articles and about two thirds of conference proceedings are read from computer screen. Blogs were mostly (78%) read online from computer screen.

Newspaper articles on the other hand were not printed for reading at all. Newspaper articles were either read online from computer screen (43.9%) or read from printed newspaper (42.2%).

Reading from the mobile phone, e-reader or tablet screen is not very common for any publication type. However, blogs, newspaper articles, and non-fiction/fiction are more likely to be read from hand held device compared to other publication types.

Some disciplinary differences are found ($\chi^2 .019$) in journal article readings. In the humanities, scholars read from printed journals compared to other disciplines. However, scholars in other disciplines printed downloaded articles more often for reading. Scholars in humanities were also somewhat more likely to read the article from hand held-device. Also, teaching/administrative intensive scholars were more likely to read print articles from printed journals compared to research intensive scholars ($\chi^2 .015$). There were no difference between scholars working in different positions or between scholars focusing on basic and applied research.

Table 18. In what format the publication was read

	Print	Downloaded and printed on paper	Previously downloaded / saved and read on computer screen	Online computer screen (desktop or laptop)	On a mobile phone, e-reader, or tablet screen
Journal articles (n=455)	5.3(24)	40.4 (184)	18.7 (85)	33.0 (150)	2.6 (12)
Scholarly books (n=94)	56.4 (53)	18.1 (17)	7.4 (7)	17.0 (16)	1.1 (1)
Conference proceedings/ research reports (n=91)	5.5 (5)	27.5 (25)	18.7 (17)	46.2 (42)	2.2 (2)
Newspapers (n=66)	42.4 (28)	0	1.5 (1)	43.9 (29)	12.1 (8)
Magazine article (n=56)	66.7 (38)	5.3 (3)	1.8 (1)	21.1 (12)	5.3 (3)
Blog (n=27)	0	3.7 (1)	0	77.8 (21)	18.5 (5)
Non-fiction / fiction (n=58)	86.2 (50)	1.7 (1)	3.4 (2)	0	8.6 (5)

Where the reading took place

Scholars most typically read journal articles, scholarly books, conference proceedings, and blogs in their office or lab (table 19). Articles in newspapers or magazines and non-fiction/fiction were read more often at home. About ten percent of the readings were done when travelling. Blogs and non-fiction/fiction were most likely to be read travelling. Reading in the library was almost non-existent.

There were some differences between disciplines ($\chi^2 .001$), status ($\chi^2 .000$), and research and teaching/administrative intensive scholars ($\chi^2 .000$) if comparing the share of journal article readings taking place at the office/lab to other places (dummy factor was recoded for this purpose, office/lab=1, other place=0). Social scientist and humanists, professors and lecturers, and teaching/administrative intensive scholars read articles most typically out of the office/lab.

Table 19. Where the reading took place

	Office or lab	Home	Travelling/commuting	Elsewhere
Journal articles (N=452)	65.8	22.7	8.2	2.4
Scholarly books (N=94)	59.6	25.5	8.5	6.4
Conference proceedings/ research reports (N=92)	79.3	10.9	8.7	1.1
Newspapers (N=67)	37.3	50.7	6.0	6.0
Magazine article (n=57)	38.1	47.6	6.0	8.3
Blog (n=27)	63.0	22.2	11.1	3.7
Non-fiction / fiction (N=59)	15.3	69.5	13.6	1.7

Age of readings

Scholars rely mostly on recently published materials (table 20). A clear majority of newspaper, magazine article, and blog readings were published within the last year. In addition, about one half of the academic publications, such as journal articles, scholarly books, conference proceedings/reports were published within the last year. However, more than one fifth of the scholarly books/chapters and almost half (46%) of non-fiction/fiction books were published more than five years ago.

Journal articles published within the last year were found more often by browsing and by other means (such as social media alerts) compared to older articles ($\chi^2 .000$). In addition, articles published more than five years ago were found more often by citations compared to recently published articles ($\chi^2 .000$).

Analyses on disciplinary differences ($\chi^2 .009$) show that scholars in the humanities typically read older journal articles (30.3% more than 5 years ago) and scholars in sciences focus more on recently published articles (65.8% during the last year). In addition, scholars focusing on basic research read older publications

(18.6% more than 5 years ago) compared to scholars focusing on applied research ($\chi^2 .025$). There were also some differences between status ($\chi^2 .039$). Directors and project managers use mainly articles (74.4%) published with the last year, as doctoral students and post docs use more articles published more than five years ago.

Table 20. When was the publication published?

	Within the last year	Within last 2-5 years	More than 5 years ago
Journal articles (N=453)	53.6	32.2	14.1
Scholarly books (N=95)	45.3	32.6	22.1
Conference proceedings/ research reports (N=93)	64.5	32.3	3.2
Newspaper articles (N=68)	98.5	1.5	0
Magazine article (n=57)	89.5	10.5	0
Blog (n=27)	96.3	3.7	0
Non-fiction / fiction (N=59)	15.3	39.0	45.8

Language of the publications

Academic publication readings (journal articles 91%, books/chapters 74%, and conference proceedings 65%) were written most often in English (table 21), while more than 70% of read newspaper and magazine articles were written in Finnish. Also over half of the blogs, non-fiction books, and fiction books were written in Finnish.

Reading journal articles written in Finnish is most typical in social sciences and humanities ($\chi^2 .006$). In the hard sciences reading journal articles in Finnish is not very typical because publishing is often focused on international journals (Puuska & Miettinen 2008).

Teaching/administrative intensive scholars and those focusing on applied research read journal articles more often in Finnish compared to research intensive scholars ($\chi^2 .000$) and those focusing on basic research ($\chi^2 .007$). Lecturers and project researchers read articles more often in Finnish compared to scholars with other status ($\chi^2 .000$).

Scholarly journal articles written in English and Finnish seem to differ a great deal. Finnish articles were more often obtained ($\chi .000$) and read from a print source and they were read also more often at home ($\chi^2 .002$). This is probably because memberships of many Finnish academic societies include a print subscription of the journal published by the society. Finnish articles were read more often for current awareness, teaching, and interest/pleasure compared to English articles which were read mostly for research and writing ($\chi .000$).

Articles written in English were ranked more important for work ($t = -4.367$, sig. .000) and were cited more often compared to articles written in Finnish (chi .000).

Table 21. In what language was the article written

	Finnish	English
Journal articles (N=454)	7.3	90.7
Scholarly books (N=91)	26.4	73.6
Conference proceedings/ research reports (N=91)	35.2	64.8
Newspaper articles (N=68)	83.8	16.2
Magazine article (n=54)	81.5	18.5
Blog (n=27)	55.6	44.4
Non-fiction / fiction (N=55)	56.4	43.6

Discussion and conclusions

Our study continues the tradition of King and Tenopir studies concentrating on scholars reading and information seeking behavior (e.g., King et al., 1981; Belefant-Miller and King, 2001; Tenopir and King, 2000; Tenopir and King, 2004; Tenopir et al., 2009a; Tenopir et al., 2010; Tenopir et al., 2015). The majority of our results concerning scholarly article reading are consistent with earlier findings in the U.S., U.K., Finland and other countries. (Tenopir et al., 2015). This article offers new knowledge especially on other than journal article readings by giving holistic view of scholars reading practices.

The results of our study show that scholars read a lot and they read a variety of publications for work-related purposes. On average, scholars reported 59 total readings per month. Scholars engaged for example in average 20 journal article readings per month, three scholarly book or book chapter readings per month, and 17 newspaper article readings per month. Earlier, Tenopir et al. (2015) showed increase in the number of read articles within one year and our results show similar increase (see also Late et al. 2018). The improved technology and increased availability of materials may be one factors increasing the number of read articles. However, Tenopir et al (2015) have showed that scholars use less time for reading one article. Thus, it is possible that scholars read more articles but use still the same time for reading.

Not all types of readings are the same--different types of publications are read in different ways and for different purposes. While scholarly articles, books and conference proceedings are read mainly for research and writing (also in Tenopir et al. 2015), other types of publications such as newspaper articles and blog posts are read more often for current awareness or for interest and pleasure. Academic publications are often read selectively by reading only a part of the article with great care. Academic publications are also more often

cited. Earlier studies have shown that scholars tend to cite current articles more often (Guthrie 2000, Odlyzko 2000, Herman 2004) but our results showed no evidence for this.

Academic publications are found most typically by searching and by colleagues and obtained from the library collections. As in Tenopir et al (2015) study, half of the read journal articles were found from library collections. Only 2% of the read articles were obtained from personal subscriptions. Other publications are found more often by browsing and obtained from personal collections/by own subscription or from the internet. Results confirm the findings showed in the report by Tenopir et al. 2012 that books are still often obtained from personal collections.

Both academic and other types of publications are read in printed and electronic format. Scholars make distinctions in their reading habits by the type of material and the purpose of reading. Articles are most often read for research, are obtained electronically, but are still often printed out for reading. However, studies are showing some change in patterns towards reading from the screen (Late et al. 2018). Books are still mainly read as printed books, in spite of the fact that Finnish scholars have access to shared e-book collections. Newspaper articles are more likely to be read in their original form (electronic or print) and are used for current awareness. Academic publications are read most often in English while other publications in the readers' native language, this case in Finnish.

The amount of reading especially of scholarly articles and books varies not only between disciplines, but also between status, nature of research, and nature of work. Still, scholarly articles are most frequently read and are rated as the most important publication type in every discipline (Tenopir et al. 2015).

In the so-called hard sciences (natural sciences, medical sciences, technical sciences) scholars read and value most international journal articles. In technical sciences, the role of conference papers is also strong. In the soft sciences (social sciences and humanities) reading practices are more varied including international and national journal articles, scholarly books and more general publications. Our results show that reading practices in different disciplines follow the disciplinary publishing practices (see for example Piro et al. 2013, Niu and Hemminger 2012).

We also studied the influence of nature of research (basic vs. applied) and nature of work (research vs. teaching/administration) to the reading practices. We discovered that reading practices of scholars focusing on basic research are very similar to research-intensive scholars. These scholars read and value international scholarly journals and other academic publications. Those focusing on applied research and those orientated on teaching/administration read and value more often professional and general publications such as professional magazines and newspapers. Tenopir et al. (2012) found earlier that research-intensive scholars read more scholarly journal articles compared with those using less time for research and writing. Teaching-oriented scholars read more books.

Similarly, reading varied according to rank. Professors and doctoral students read and value most academic publications. Directors and lecturers value professional magazines and newspapers in addition to academic publications. In addition, lectures value textbooks more than other groups. Differences are the most likely to be related with different information needs in different types of work tasks and work roles (eg. research vs. teaching) as for example Leckie (2005) has suggested. However, the work practices of research and teaching/administration orientated scholars should be studied more to understand better the information needs in different types of tasks.

Other interesting future research questions include how are the scholarly information practices evolving and what is the role of academic and other type of publications in scholars work. The widening availability of different types of materials through for example open access and social media may change scholar's information behavior. In the following years, it would be valuable to follow the changes in the communication

practices as the movement towards open science is changing the whole scholarly communication system. Academic libraries and others who aim to support scholars in information seeking and use need to stay aware of the evolving practices. Future studies focusing on scholars reading practices should also take into account different types of academic, professional, and general publications. Although, scholarly journals are still the main communication forums in most disciplines, our study shows that journals do not cover all information needs raised in different scholarly tasks. However, the type of resource (article or book or blog, for example) still matters to readers, whether it is print or electronic. Type of resource indicates value and purpose to scholarly readers.

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