Trustworthiness and Authority of Scholarly Information in a Digital Age: Results of an International Questionnaire

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An international survey of over 3,600 researchers examined how trustworthiness and quality are determined for making decisions on scholarly reading, citing, and publishing and how scholars perceive changes in trust with new forms of scholarly communication. Although differences in determining trustworthiness and authority of scholarly resources exist among age groups and fields of study, traditional methods and criteria remain important across the board. Peer review is considered the most important factor for determining the quality and trustworthiness of research. Researchers continue to read abstracts, check content for sound arguments and credible data, and rely on journal rankings when deciding whether to trust scholarly resources in reading, citing, or publishing. Social media outlets and open access publications are still often not trusted, although many researchers believe that open access has positive implications for research, especially if the open access journals are peer reviewed.

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Introduction

Scholarship depends on trust as a guiding principle and is a cornerstone of research, regardless of the subject field or the age of the researcher. Although the modes of scholarly communication have changed with technical innovation, this essential tenet has not. The entire scholarly endeavor consists of communities of trust among individual researchers, audiences, and publishing outlets. Researchers as producers and consumers of information depend on long-established trustworthy resources and outlets. However, virtual social networks, social media, and other Internet resources have changed the way individuals receive and access the resources they need. The peer-reviewed journal article is still the pinnacle of quality for the vast majority of researchers, but it is not the only source of information. Traditional journals, indexing and abstracting sources, and search systems have been joined by a variety of social media and search engines for locating scholarly information. Although the choice of sources and outlets has expanded, the need for reliable and trustworthy information remains constant. In this dynamic information environment, researchers have to adapt how they evaluate the trustworthiness of the sources they use, and cite, as well as those they choose for disseminating their research findings.

We do not know whether every researcher has the same evaluation criteria for each of these activities, however. The purpose of this study is to determine how researchers assign and calibrate authority and trustworthiness to the scholarly sources and channels they choose to use, cite, and disseminate their scholarly work. We look at two demographic variables to determine whether evaluating trustworthiness of sources for use, citing, and disseminating varies by:

- Age of researcher (segmented here as early career/younger researchers who are 40 years old and under, and mature career/older researchers, who are over 40 years old).
- Subject field/discipline of researcher (life sciences, physical sciences, social sciences, or humanities; henceforth, this will be referred to as field of study).

Background

Trust and authority in scholarly communications in the light of the digital transition, a research project funded by the Alfred P. Sloan Foundation and conducted by CIBER Research Ltd. in the United Kingdom, and the University of Tennessee's (UT) Center for Information and Communication Studies in the United States, seeks to examine the effects of the digital transition upon issues of trust and authority in scholarly communication. In particular, the project investigates how new digital technologies and innovations such as social media and open access (OA) journals have affected how researchers determine the quality of resources, how they use them, whether they cite these resources, and where they publish their work (Nicholas, 2013).

The Internet has become the center of the scholarly research process (Moss, 2011; Nicholas et al., 2014). Although it may be the most powerful disseminator of information the world has ever known, there is also a great potential to abuse trust (Moss, 2011). Information or research may be outdated, inaccurate, or biased; authority may be unclear (Batini & Scannapieca, 2006; Fisher, Lauría, & Chengalur-Smith, 2012). Agichtein, Castillo, Donato, Gionis, and Mishne (2008) argue that this situation has been complicated by the rise of Web 2.0 tools that transform the type of available content. Scholarly information on the web is no longer limited to a finite number of publishers whose role as gatekeepers of knowledge have remained virtually the same in online and traditional publications. Within this new digital landscape, everyone can be a producer as well as a consumer of information. This introduces unique issues of trust and authority for researchers.

Within the scholarly community, trust is defined in several ways (Grabner-Krauter & Kaluscha, 2003; Hertzum, Andersen, Andersen, & Hansen, 2002; McKnight & Chervany, 2002). Mayer, Davis, and Schoorman's (1995) definition of trust is "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action" (p. 712). Grabner-Krauter and Kaluscha (2003) echo this and point out that, although trust is often defined or confined by the boundaries of a particular field, trust can "only [exist] in an uncertain and risky environment" (p. 785). Pickard, Gannon-Leary, and Coventry (2010, 2011) argue that establishing trust is a process complicated by internal and external factors. Rieh and Danielson (2007) note that researchers now have to wade through a plethora of information sources, which results in greater uncertainty with regard to trustworthiness and require new skill sets for judging trustworthiness.

Trust itself is characterized by a certain measure of vulnerability (Mayer et al., 1995), however, that vulnerability is mediated in today's world through technology, and, thus, communication is "depersonalized" (Rowley & Johnson, 2013). Corritore, Kracher, and Wiedenbeck (2003) and Kelton, Fleischman, and Wallace (2008) argue that computers have become part of social interactions so much that the computers become objects of trust themselves. This consequence of technologically driven innovation may apply to websites and social media as well.

Trustworthiness may be dependent on the user's perceived value of resources. Many researchers have identified frameworks for how users evaluate web-based information (Chai, Potdar, & Dillon, 2009; Klein, 2001; Knight, 2008; Knight & Burn, 2005). These attributes of quality include accuracy, consistency, timeliness, reliability, accessibility, objectivity, usefulness, efficiency, and reputation (Chai et al., 2009) in addition to presentation of information, type of information, citation, and reasons for publication (i.e., agenda; Pickard et al., 2010, 2011) .

The very nature of the digital environment, often fluid, anonymous, and expanding, places even more importance on trust as a characteristic. Indeed, the vast majority of information available on the web is unmediated, or rather, is not peer reviewed. Because professionals such as librarians, publishers, and editors are no longer "vouching" for most of this web information, the individual's reliance on his own judgment is more important than ever (Nicholas, Huntington, Jamali, & Dobrowolski, 2008; Rieh & Danielson, 2007). Self-reliance creates a special kind of crisis in information evaluation because individuals often *believe* that they have more skill in evaluation than they may actually have (Herman & Nicholas, 2010).

OA journals present a specific challenge to individuals when it comes to evaluating the trustworthiness of information. Even though many OA journals are peer reviewed and many are published by traditional publishers, researchers do not always judge them as credible. Indeed, many scholars note poor quality as a reason for not publishing in an OA journal (Coonin, 2011; Dallmeier-Tiessen et al., 2011; Solomon & Björk, 2012; Warlick & Vaughan, 2007). Others note that some OA publishers may be predatory (Beall, 2012), meaning that they publish large numbers of flawed articles indiscriminately (Beall, 2013; Bohannon, 2013).

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The changing dynamic related to trust in scholarly resources is further complicated by a system of scholarly publications in higher education in which universities and research institutes are under increasing pressure to conduct research that aligns with the needs of funders (Nedeva, Boden, & Nugroho, 2012; Sovacool, 2008). The mentality of "publish or perish" (Wilson, 1940) is reinforced by the needs of funders and pressures for job promotion, and quantity of publications is sometimes at odds with quality of publications. Many new publications have emerged to meet the need for more publication venues, and many scholars lament the perceived loss of quality and dependability in research today (Bauerlein, Gad-el-Hak, Grody, McKelvey, & Trimble, 2010; Colquhoun, 2011; Fang & Casadevall, 2011).

The pressure to publish may be leading to increased incidents of research misconduct such as plagiarism, fabrication, and falsification. Many studies have focused on the phenomenon of "research misconduct" in the sciences and social sciences (see, for example, Fanelli, 2009; John, Loewenstein, & Prelec, 2012; Martinson et al., 2005; Rajasekaran, 2012). Researchers have admitted to "questionable research practices" such as not reporting all dependent measures and collecting more data once results are shown to be significant (John et al., 2012). Some claim that studies are being fragmented of into several papers of little value or importance (Rajasekaran, 2012) and that there is a tendency to emphasize positive results (Fanelli, 2009). It should be noted that the greater amount of misconduct reported may be a product of a growing awareness rather than an increase in actual incidents (Noorden, 2011). Furthermore, greater transparency in today's publishing outlets where readers instantly discuss and comment on publications through blogs and Twitter may make authors more acountable and reduce incidents of misconduct (Taraborelli, 2008).

If such research misconduct is occurring in the peer-reviewed literature (Carey, 2011; Fanelli, 2009; Lacetera & Zirulia, 2011; Steneck, 2006), then what does this say for nonpeer-reviewed outlets such as social media? Lankes (2008) and Metzger and Flanagin (2013) suggest that the use of social media in the research context has necessitated a different method of evaluation. Researchers are moving away from a tradition-based trust or authority in publications, in which readers view journals, institutions, and publishers themselves as reliable evaluators of information, to a more personal means of determination (Lankes, 2008). These include characteristics of evaluation that rely on a researcher's own information base: reputation, endorsement, consistency, self-confirmation, expectancy violation, and persuasive intent (Metzger & Flanagin, 2013). In a report for the Publishing Research Consortium, Tenopir et al. (2010) found that researchers used a variety of characteristics to determine which articles to read and cite. Topic, accessibility of article, and source of article were the top choices, and author, type of publisher, and associated institution ranked last (Tenopir et al., 2010, 2011). Researchers are more likely to read articles from top authors or unknown authors rather than from "known but weak authors" (Tenopir et al., 2010). Although it is still important for researchers to know the source of information, this may not be the most important characteristic.

There is some evidence of changing behaviors. A study of six U.K. universities indicated that, although academic creation and use of social media content were occasional rather than regular, the use of social media in the research context was increasing, particularly for the dissemination of work (Tenopir & Volentine, 2013). Rather than replacing traditional scholarly reading, social media enhance or support that reading behavior for research and teaching (Tenopir & Volentine, 2013). Academics and publishers are beginning to view social media as an extension of traditional scholarly publishing outlets. As with other computer-mediated communication platforms, trust remains a key issue. In previous years, the use of social media to disseminate information and research was met with general skepticism because of the lack of peer review. However, as many researchers have pointed out, these attitudes are slowly changing (CIBER & Emerald Group Publishing Ltd., 2010; Huang, Chou, & Lin, 2008; Nicholas & Rowlands, 2011; Procter, Williams, & Stewart, 2010; Rowlands, Nicholas, Russell, Canty, & Watkinson, 2011).

Of course, there might be differences between age groups with regard to trust, authority, and productivity of scholarly materials. Younger academics are more likely to read articles recommended by colleagues than are older academics (Tenopir, Volentine, & Christian, 2013). This may indicate that younger academics trust sources that are vetted by a colleague, whereas older academics are more confident in their own ability to find reliable sources. Generational differences in web searching have also been explored. One study, which focused on members of the general public and not researchers, found differences in the amount of searches undertaken to find a specific answer and the time taken to run searches. Members of the so-called "Google generation" performed fewer searches and took less time to find answers to questions, even though they also felt the least confident in their results (Nicholas, Rowlands, Clark, & Williams, 2011). These findings may indicate differences in perceived trustworthiness of sources or lack of motivation to find the most trustworthy source among different generations of users.

Differences in social media use among age groups have also been seen. Although younger academics may be more prone to use newer social media tools such as social tagging and microblogging, the real difference lies in their *willingness* to use these resources. For younger academics, using social media went beyond the "simple use" of a tool; it was "a philosophy, a culture" (Rowlands et al., 2011, p. 188). Perhaps this also demonstrates more willingness to place trust in these sources, especially if they are properly evaluated and vetted (Rowlands et al. (2011).

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Tenopir et al.'s studies of scholarly reading (Tenopir et al., 2010, 2011) have documented the reading behaviors of scientists and social scientists in the last three decades, with researchers in medicine and science consistently reading more articles on average than humanists or engineers. Other studies show that researchers in the fields of medical sciences and life sciences tend to have a more positive association of OA articles as peer reviewed compared with other fields. Medical science researchers are much more skeptical of articles that have not been peer reviewed than are physicists and mathematicians, who prefer quick dissemination over peer review (Creaser et al., 2010). Highly collaborative fields, such as high-energy physics, are more open to nontraditional means of communicating information such as circulating preprints (Fry & Talja, 2007). Junior researchers in more collaborative fields are able to build their reputations by publishing with more established researchers within their work groups; whereas junior researchers within the humanities tend to publish first in lower quality journals just to get their names out (Fry & Talja, 2007).

Differences among researcher behaviors by academic fields have also been found with respect to the use of social media in research. Many researchers have started incorporating social media tools into their research, but, in general, scientists use social media in research more than social scientists and humanities researchers (Rowlands et al., 2011). Tenopir et al. (2013), however, found that academics in the social sciences and humanities are participating in and creating more social media for teaching or research than scientists. Differences in social media use may indicate differences in perceived quality of the media; however, based on these conflicting studies, it is unclear what differences do in fact exist across fields.

Methods

An international survey was conducted in 2013 to explore how trust is defined for scholarly information and to discover how scholars worldwide perceive trust to have changed with new forms of scholarly communication. Survey participants were contacted through e-mail invitations sent by scholarly publishers to authors who have contributed to their journals. The publishers reached a wide range of academics worldwide. Participating publishers included: BioMed Central, Elsevier, PLoS, Sage, Taylor & Frances, and Wiley. Each publisher sent the authors a link to the questionnaire (See Appendix), which was the same for every participant. The survey, which was hosted on SurveyMonkey.com, went live on May 28 and was closed on July 30, 2013.

Participants were asked a total of 24 questions regarding their use of scholarly information and reading habits, dissemination practices, citation practices, and personal demographics. The results allow us to examine how trust and authority issues influence the sources academics use and cite as well as the sources they choose to publish their own research. The demographic information collected included age, academic field, country, and publication rate. This article examines overall findings and variations by age, field, and publication rate.

The six publishers distributed e-mail invitations to their author lists, inviting them to participate in the online questionnaire. Slightly over one third of the respondents (1,318, 36.1%) were researchers who received the invitation from Elsevier, followed by Sage (1,073, 29.4%), Taylor & Francis (658, 18.0%), Wiley (283, 7.8%), BioMed Central (38, 1.0%), and PLoS (12, 0.3%). In total, 3,650 researchers responded to at least one question.

Limitations

The survey was sent to researchers who had published at least one article in a traditional scholarly journal at some point in their careers and were on one of the publishers' mailing list. Therefore, the results do not represent scholars who have completely eschewed traditional publishing routes. Because we are not sure how many surveys were distributed to unique potential respondents, we cannot calculate a response rate. Because respondents could skip any question, were allowed to leave the survey at any time, or were timed out automatically if they began the questionnaire and did not complete it, approximately 20% declined to answer most of the demographic questions. All five-point Likert scales used 1 to indicate the highest level of agreement. The convention in North America is often to use 1 for the lowest level of agreement and one third of the respondents came from the United States or Canada. Although we do not believe that there was confusion on the scales (all were clearly labeled), we cannot be sure. A t-test to indicate differences between the U.S. and non-U.S. samples was conducted, and no differences were found; thus, we are confident that the U.S. sample followed the instructions and responded to the items correctly. Using age to identify career maturity is viable, but there may be some "returning scholars" who have entered the community at a later age and who may still be less well established, untenured researchers.

Participants

Countries of respondents were grouped into seven regions, North America, South and Central America, Europe, Africa, Asia, the Middle East, and Australia and Oceania. Approximately one third (985, 32.8%) of respondents are from North America, with 29.7% from Europe, 16.6% from Asia, 6.4% from the Middle East, 5.2% each from South/Central America and Australia/Oceania, and 4% from Africa. A complete analysis of findings by country and by region can be found in Jamali et al. (2014).

Nearly two thirds of the respondents are male (1,943, 64%); over one third (39%) of the respondents are under 40 years of age, and the mean age is 45 years.

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Respondents selected the broad subject heading that best describes their subject area of interest. They could also select "other," and those subjects were placed into the appropriate subject area if applicable. For example, nursing was placed in "medicine, allied health, and veterinary science," and leadership was placed in "economics, business, and management."[1] We grouped the subject areas into four meta-categories, life sciences (24.5% of responses), physical sciences (24.4% of responses), social sciences (42.9% of responses), and humanities (7.2% of responses).

Nearly half (47.6%) of the respondents work in a research-intensive university, whereas 18% work "Primarily Teaching in a University/College." The average amount of experience as a researcher is 14 years. Slightly less than half (43%) of the respondents have from 2 to 10 years of experience as a researcher, and nearly one fourth (24%) of the respondents have over 20 years of experience.

Most (98%) of the respondents have published journal articles as author or coauthor within the past 3 years. (This was expected because the population surveyed was made up of those who have published at least once with one of the publishers who distributed the questionnaire.) Over half (52%) have published three to 10 articles in that period. Most of the respondents (80%) are not and have never been an editor of a journal, but over one third (38%) are or have been a member of the editorial board of a journal, and over three fourths (78%) have reviewed articles for journals.

Using and Reading Information

Activities

Deciding what information to use or read for research is a key component of trustworthiness. To discover the range of activities and criteria used in this decision-making process and the relative importance of different ones, we asked respondents to rank a list of the activities and then criteria on a five-point scale from *extremely important* to *not important*. By assigning a number to each point on the importance scale, we can average all the responses to see which activities and criteria received the highest importance ranking overall. Note that a ranking of "1" is the highest ranking possible (extremely important).

The most highly ranked activities across all respondents are "checking if the arguments and logic presented in the content are sound," "checking to see if the data used in the research are credible," and "reading the abstract." These results indicate that typically researchers are making reading and use decisions based on the actual content of an article rather than on external metrics and reputations of authors, journals, or publishers.

A rigorous peer-review process can help to ensure that the arguments and logic within an article are sound, thus encouraging researchers to read and use the article. Additionally, researchers are utilizing the data presented with articles to determine whether articles are credible and, therefore, usable within their research. Therefore, the growing trend for journals to encourage or require authors to provide access to the data discussed within an article may be helping other researchers to make important decisions about reading and use of materials within the journal. Similarly, authors who provide access to their data may find it easier to attract readers, provided that their data are credible.

There are a few significant differences in the rankings depending on respondents' age and field of study. Based on statistical differences in survey responses, younger researchers find external clues and metrics to be more important for determining what to read than older researchers. Younger researchers believe more strongly that the journal's impact factor is important for deciding what to read (2.73 vs. 2.99). They also believe that checking whether the source is indexed by an authoritative body and checking the number of times it has been downloaded or accessed are more important than for older researchers (2.96 vs. 3.12 and 3.66 vs. 3.98, respectively). Younger researchers rate determining whether an author's country of affiliation is known for its research as more important than do older researchers (3.79 vs. 3.94). Younger researchers also find it more important than older researchers to take into consideration their colleagues' opinions of sources when determining what to read (3.22 vs. 3.45). Additionally, younger researchers rate reading the abstract as more important than older researchers for determining what to read. On the other hand, older researchers find it to be more important to rely on their own knowledge of the subject and the field when determining what to read compared with their younger counterparts. For example, older researchers rate checking for sound arguments and logic as more important than do younger researchers (1.58 vs. 1.77). Older researchers also think that checking the name of the author is more important than do younger researchers (3.04 vs. 3.14). Presumably, older researchers have been in their field longer than younger researchers and, therefore, feel more confident than younger researchers to make their own judgment of an article's content and author. Older researchers also consider checking whether the paper has been peer reviewed as more important than do younger researchers (2.12 vs. 2.24).

The largest differences in this category were found in field of study, which accounted for the most differences when rating the importance of activities and criteria used to decide what to read (Table 1). Respondents in the life sciences rate checking the credibility of the source's data (1.63), reading the abstract (1.86), checking the methodology (1.96), and checking to see whether the source is peer reviewed (1.97) as more important in selecting material to read than do physical scientists, social scientists, or humanists. For humanists, reading the information source (1.99) and examining the argument's soundness and logic (1.47)

[1]Typically the "other" response was due to the respondent not reading the answer choices carefully.

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TABLE 1. Perceived importance of trust activities when using and reading information by field of study of respondents (presented as means).

Ranking	Activity	n	Life sciences	Physical sciences	Social sciences	Humanities
1	Reading the information source	2,990	2.18	2.25	2.21	1.99*
2	Reading the abstract	2,990	1.86*	1.92	1.90	2.24
3	Checking the figures and tables	2,978	2.15*	2.35	2.59	3.01
4	Checking the methods	2,979	1.96*	2.22	2.09	2.35
5	Checking to see the means by which it has been disseminated/published	2,987	2.77	2.84	2.57	2.45*
6	Checking to see whether the source is indexed by an authoritative indexing body (e.g., ISI, PubMed)	2,979	2.76*	3.23	3.08	3.18
7	Checking the name of the author	2,997	3.29	3.13	3.01	2.67*
8	Checking the journal	2,998	2.65	2.75	2.48	2.35*
9	Checking the name of the publisher	2,987	3.62	3.59	3.39	2.90*
10	Checking to see whether the data used in the research are credible	2,993	1.63*	1.86	1.71	1.77
11	Checking to see whether arguments and logic presented in the content are sound	2,996	1.72	1.76	1.60	1.47*
12	Checking to see whether it is peer reviewed	2,985	1.97*	2.40	2.14	2.39
13	Taking account of where it was obtained(e.g., publisher's website, university library catalogue, search engine)	2,974	3.72	3.82	3.45	3.28*

Note. The lower the number, the more important the activity to the respondent. 1 = "extremely important," 2 = "very important," 3 = "important," 4 = "somewhat important" 5 = "not important."
*$p < 0.05$.

were most important. The names of the author, publisher, and the journal are more important for humanists than for the other disciplines.

Criteria for Judging Reading Trustworthiness

The second set of items presented a series of statements relating to criteria for judging quality and trustworthiness of information sources. Respondents were asked to indicate how strongly they agreed or disagreed with each statement on a five point scale from 1 = *strongly agree* to 5 = *strongly disagree*. We also allowed respondents to select "don't know," which is excluded from the mean calculation.

The mean ranking of the statements shows which statements are most agreed with by the respondents. The most highly rated statement is: "Peer-reviewed journals are the most trustworthy information source." In the previous section we established that an important activity for older researchers is checking to see whether an article has been peer reviewed. Similarly, older researchers, compared with younger researchers, believe more strongly that peer-reviewed journals are the most trustworthy information source (1.83 vs. 1.90). Younger researchers believe more strongly than older researchers that OA publications are peer reviewed and trustworthy (2.21 vs. 2.33). These findings indicate that younger researchers are more accepting of less traditional sources of information, although these less traditional sources should be peer reviewed to be seen as trustworthy.

Academic field of study accounts for significant differences in all statements, with life scientists more likely to strongly agree with the trustworthiness of the peer-review process and journal impact factor and social scientists to agree more with reading recommendations by colleagues (Table 2). All disciplines were more likely to disagree that accessibility overtakes quality when pressed for time.

Disseminating/Publishing Information

Criteria for Dissemination

Most researchers and faculty members are authors (creators) of scholarly work in addition to being readers (consumers) of scholarly work, so we asked a separate set of questions about the importance of a series of attributes of an outlet when deciding where to publish/disseminate research work. Respondents ranked the attributes' importance on a five-point scale from 1 = *extremely important* to 5 = *not important*. As with reading, traditional journals and peer review are important considerations in deciding how to disseminate research.

When the average of the attributes is calculated, "relevance to field" and "peer reviewed" are the most highly valued attributes of trust and quality for deciding where to publish. In general, "if the outlet is open access" or "if the outlet is based in a country known for the quality of its research" are not considered important factors in deciding where to publish or disseminate research work.

Age influences choice of dissemination, with older researchers more likely to react favorably to traditional scholarly publishers (2.48 vs. 2.63). Regardless of age, choosing a relevant source and one that is peer reviewed are

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TABLE 2. Agreement with statements about quality and trustworthiness of source by field of study of respondents (presented as means).

Ranking	Statement	n	Life sciences	Physical sciences	Social sciences	Humanities
1	Peer-reviewed journals are the most trustworthy information source.	2,988	1.77*	1.87	1.89	2.00
2	I am very likely to read an article recommended to me by a colleague.	2,974	1.97	1.98	1.90*	1.94
3	My main criterion for finding out whether a source is trustworthy is the content itself (whether it makes sense, it is consistent with what I believe etc.).	2,971	2.29	2.20*	2.37	2.22
4	Open access publications that are peer reviewed are trustworthy.	2,892	2.16*	2.36	2.31	2.25
5	The journal impact factor is important for deciding what to read.	2,933	2.79*	2.93	2.89	3.03
6	Wikipedia has become more trustworthy over the years.	2,846	2.78	2.66*	2.91	2.77
7	If the information is not central to my research area, the ease of availability of a source is more important than its quality.	2,925	3.16	3.09*	3.26	3.18
8	When pressed for time, the ease of availability of a source overtakes considerations about its quality.	2,950	3.16	3.15*	3.33	3.32

Note. The lower the number the more important the activity to the respondent. 1 = "strongly agree," 2 = "agree," 3 = "neither agree nor disagree," 4 = "disagree," 5 = "strongly disagree."
*$p < 0.05$.

TABLE 3. Perceived importance of publication attributes of publications by field of study of respondents (presented as means).

Ranking	Relevance	n	Life sciences	Physical sciences	Social sciences	Humanities
1	It is highly relevant to my field	2,996	1.88	1.82	1.81	1.81
2	It is peer reviewed	2,981	1.78*	1.93	1.87	2.12
3	It is published by a traditional scholarly publisher	2,976	2.72	2.57	2.47	2.33*
4	It is highly cited	2,989	2.53	2.52*	2.70	2.78
5	It is indexed by reputable/prestigious abstracting/indexing databases, such as ISI or Scopus	2,937	2.36*	2.59	2.74	2.97
6	It has a reputable editor/editorial board	2,967	2.74	2.69	2.62	2.54*
7	It is published by a society in my field	2,932	3.16	3.03	3.08	3.13
8	It has both an online and a print version	2,965	3.15	3.22	3.12	3.12
9	It is open access	2,921	3.33*	3.62	3.48	3.40
10	It is based in a country known for the quality of its research	2,897	3.56	3.63	3.65	3.73

Note. The lower the number the more important the activity to the respondent. 1 = "extremely important," 2 = "very important," 3 = "important," 4 = "somewhat important" 5 = "not important."
*$p < 0.05$.

by far the most highly rated criteria for disseminating their work. Although none of these factors is rated on average much more than a 3, younger researchers rated the remaining factors significantly higher.

Field of study also accounts for differences in choosing where to publish (Table 3). Humanities researchers rate traditional scholarly publishers and reputation of an editorial board more highly than workers in other fields, whereas life scientists rate peer review, indexed by reputable databases, and OA more highly. Physical scientists rate highly cited sources more highly.

Quality and Trustworthiness of Publishing Venues

In a series of statements about quality and trust of publishing venues, the most agreed upon statement is that peer-reviewed journals are the most prestigious place in which to publish and that they are likely to contain high-quality material. Respondents also agree with the statement that people who do not have tenure have to publish in good journals to build a reputation. Most respondents do not agree that blogging is a good way to test the veracity of their ideas or that depositing work in a repository is a reliable way to reach a wider audience. In terms of publication sources, these responses indicate that, at least when deciding where to publish, traditional criteria for trust are still the most important.

As expected, younger researchers in the process of establishing their careers are more concerned with building their reputations through citations and usage of their publications, including obtaining grants through publishing in the most respected journals in their field, than their older colleagues.

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TABLE 4. Agreement with statements about quality and trustworthiness of places to publish/disseminate by field of study of respondents (presented as means).

Ranking	Statement	n	Life sciences	Physical sciences	Social sciences	Humanities
1	As peer-reviewed journals are the most prestigious place in which to publish, they are likely to contain high-quality material.	2,982	1.97	1.96	2.01	2.12
2	People who don't have tenure have to publish in good journals to build up a reputation.	2,905	2.14	2.02	1.99*	1.99*
3	To obtain research grants I have to publish in highly ranked journals.	2,839	2.02	1.95*	2.15	2.08
4	I publish in journals because a paper placed in a journal obtains a context, becomes part of a "conversation".	2,886	2.38	2.51	2.67	2.27*
5	Depositing a version of my published work in an institutional repository increases usage and thereby helps to build up my professional reputation among my peers.	2,547	2.87	2.75	2.64*	2.76
6	Depositing a version of my published work in an institutional repository increases citation and thereby helps to build up my professional reputation among my peers.	2,531	2.86	2.71	2.64*	2.74
7	I tend to publish first in a conference proceedings, which is a good way to test the veracity of my ideas.	2,912	3.14	2.97*	3.00	3.15
8	My own website is central for ensuring the reliable dissemination of my work to my target audiences.	2,585	3.31	3.02*	3.13	3.02*
9	I tend to publish first in a subject repository (prepublication database).	2,626	3.72	3.26*	3.54	3.59
10	I use social media to get out information about my research because it is a reliable way to reach my target audiences.	2,834	3.67	3.67	3.42	3.31*
11	I tend to blog about the findings of my research, which is a good way to test the veracity of my ideas.	2,704	3.79	3.66	3.62	3.60*

Note. The lower the number the more important the activity to the respondent. 1 = "strongly agree," 2 = "agree," 3 = "neither agree nor disagree," 4 = "disagree," 5 = "strongly disagree."
*$p < 0.05$.

For example, younger researchers more strongly agree that they have to publish in highly ranked journals to obtain research grants (1.97 vs. 2.13 for older researchers). They also agree that depositing their published work in institutional repositories increases usage (2.60 vs. 2.84 for older researchers) and citations (2.57 vs. 2.84 for older researchers) of their work and therefore helps to build their professional reputations. Younger researchers are also more concerned with reaching target audiences through publishing first in conference proceedings (2.91 vs. 3.16 for older researchers) and maintaining a personal website for dissemination purposes (2.97 vs. 3.27 for older researchers). On the other hand, older researchers are more likely to disagree with using conference proceedings to test the veracity of ideas (3.20 vs. 2.82 for younger researchers). Older researchers are also less likely to blog (3.88 vs. 3.41 for younger researchers) or use social media (3.74 vs. 3.28) to disseminate their work, although neither age group embraces the practice. Researchers of all ages still heavily rely on traditional publication outlets. Both older and younger researchers agree that peer-reviewed journals are the best publication outlets (1.97 vs. 2.00) and that those researchers without the security of tenure have to rely upon highly ranked journals to build their reputations (2.02 vs. 2.04).

Agreement with criteria for trustworthiness in choosing publishing venues also varies by field of study. As with the age variables, any of the new and/or novel ways of publishing are not deemed as trustworthy (Table 4). For example, all four fields view as negative (a) using their personal websites, (b) using social media to get information out about their research, (c) publishing their research first in a conference proceedings because it is a reliable way to reach target audiences, (d) publishing first in a subject repository because it is a reliable way to reach wider audiences, (e) blogging about their research findings because it is a good way to test the veracity of their ideas, and (f) publishing in a conference proceedings first because it is a good way to test the veracity of their ideas.

OA and Trust

When asked specifically about OA journals and issues of trust associated with OA, respondents indicate that the most trustworthy OA journals are those that are peer reviewed (Table 5). They are less inclined to agree with the blanket statement that OA journals are of low quality. The mean ranking excludes "don't know" responses.

There are a few differences between demographics and respondents' attitudes toward OA journals. Again, peer

DOI: 10.1002/asi

TABLE 5. Agreement with statements about quality and trustworthiness of open access journals by field of study of respondents (presented as means).

Ranking	Statement	n	Life sciences	Physical sciences	Social sciences	Humanities
1	Open access journals make trustworthy research information accessible in countries where journal subscriptions cannot be afforded.	2,751	1.89*	2.09	2.01	1.94
2	I have no problem publishing in an open access journal whether it is properly peer reviewed.	2,885	1.92*	2.13	2.12	2.11
3	I publish in an open access journal only whether it is published by a reputable publisher.	2,794	2.39	2.50	2.49	2.42
4	I don't publish in open access journals because they are of low quality.	2,817	3.71	3.37*	3.50	3.53

Note. The lower the number the more important the activity to the respondent. 1 = "strongly agree," 2 = "agree," 3 = "neither agree nor disagree," 4 = "disagree," 5 = "strongly disagree."
*$p < 0.05$.

review plays a critical role in the acceptance of OA as a publication outlet. Younger researchers have no problem publishing in an OA journal *if it is properly peer reviewed* compared with older researchers (2.00 vs. 2.11). Likewise, respondents in the life sciences have no problem publishing in an OA journal. They are also more likely to agree with the statement that OA journals make trustworthy research available in countries where subscription journals may not be affordable. However, researchers in the physical sciences are less inclined to publish in OA journals because of perceived low quality.

Citation Practices

Citing Practices of Fields

Citing decisions are another aspect of decision making based on trust. Authors read many articles for every one they decide to cite. We listed 12 citation practices and asked the respondents to consider how characteristic of their field each is and rate it on a five-point scale. The respondents most frequently list "citing the most recent source published on a topic," "citing the seminal source on a topic," and "citing the most highly cited information sources" as the most characteristic of their field. Respondents could also list other characteristics of their field's citation practices. These include citing every relevant publication on a topic, citing from developing/undeveloped countries, citing material from books, citing publications that offer a contradictory argument or counterargument to your work, citing colleagues who cite you, citing newspaper articles, and citing government documents.

When ranking the citation characteristics by their mean, "citing the most recent source" and "citing the seminal source on a topic" are rated as the most characteristic. "Citing nonpeer-reviewed sources" and "citing open peer review sources" are the least characteristic. We excluded "don't know" responses from the mean rankings.

When asked about the citing practices in their fields, younger researchers believe that citing (a) the most highly cited information sources, (b) the seminal information source published on a topic, (c) the first information source published on a topic, and (d) the most recent information source published on a topic are more important than do older researchers (Table 6).

Social scientists believe it is important to cite the most highly cited information sources; those in the humanities believe that citing the seminal information source published on a topic is important; the physical scientists report that it is most important to cite the first information source published on a topic; and the life scientists strongly believe in the importance of citing the most recent information source published on a topic (Table 7).

Quality and Trustworthiness of Sources Cited

Researchers say they that will cite from an OA journal if it has been peer reviewed, and they agree that social media mentions are indications of popularity and not quality or credibility. A journal's impact factor and the perceived low quality of OA journals do not influence their use.

Younger researchers agree more strongly than older researchers that, from a trust perspective, they are more easygoing in what they read than in what they cite(Table 8). They tend to cite people they know because they trust these people, and they cite conference proceedings only if there is no other alternative because the work there is still speculative and somewhat unreliable. They also have no problem citing an article published in an OA journal if it has been properly peer reviewed; they prefer to cite articles published in an OA journal only if they are from a reputable publisher, and the journal impact factor is important for deciding what to cite.

Social scientists report that they are more easygoing in what they read than in what they cite, whereas physical scientists tend to cite people they know because they trust

DOI: 10.1002/asi

TABLE 6. Citing practices in subject fields by age of respondent.

Ranking	Citing practices in your field	n	Mean age ≤40 years	Mean age >40 years
1	Citing the most highly cited information sources	2,893	2.48*	2.74
2	Citing the seminal information source published on a topic	2,843	2.40*	2.51
3	Citing the first information source published on a topic	2,877	2.80*	3.05
4	Citing the most recent source published on a topic	2,835	2.32*	2.44
5	Citing one's own work to improve one's citation ranking (e.g., H-index)	2,638	3.06*	3.30
6	Citing papers in the journal to which an article is submitted for publication to increase chances of acceptance	2,683	3.11*	3.49
7	Citing papers mentioned by reviewers to increase chances of acceptance	2,630	2.77*	3.16
8	Citing nonpeer-reviewed sources (e.g., personal correspondence, newspaper articles, blogs, tweets)	2,390	4.06*	4.31
9	Citing a preprint that has not yet been accepted by a journal	2,673	3.90*	4.23
10	Citing sources disseminated with comments posted on a dedicated website (open peer review)	2,823	4.12*	4.45
11	Citing, if possible, only sources published in developed countries	2,878	3.92*	4.14
12	Citing the published version of record but reading another version found on the open web	2,669	3.63*	3.99

Note. The lower the number the more important the activity to the respondent. 1 = "essential," 2 = "very characteristic," 3 = "characteristic," 4 = "somewhat characteristic," 5 = "not characteristic."
*$p < 0.05$.

TABLE 7. Mean ranking of citation characteristics of respondents and differences by field of study of respondents.

Ranking	Citation characteristics	n	Life sciences	Physical sciences	Social sciences	Humanities
1	Citing the most recent source published on a topic	2,893	2.27*	2.50	2.38	2.46
2	Citing the seminal information source published on a topic	2,843	2.57	2.57	2.39	2.22*
3	Citing the most highly cited information sources	2,877	2.62	2.73	2.56*	2.63
4	Citing the first information source published on a topic	2,835	2.92	2.82*	3.02	2.98
5	Citing papers mentioned by reviewers to increase chances of acceptance	2,638	3.18	3.06	2.80*	3.25
6	Citing one's own work to improve one's citation ranking (e.g., H-index)	2,683	3.20	3.23	**3.12**	3.43
7	Citing papers in the journal to which an article is submitted for publication to increase chances of acceptance	2,630	3.52	3.55	3.05*	3.47
8	Citing the published version of record but reading another version found on the open web	2,390	4.12	3.75	3.74	3.59*
9	Citing, if possible, only sources published in developed countries	2,673	4.08	4.09	3.99	4.04
10	Citing a preprint that has not yet been accepted by a journal	2,823	4.29	3.97*	4.02	4.09
11	Citing nonpeer-reviewed sources (e.g., personal correspondence, newspaper articles, blogs, tweets)	2,878	4.39	4.34	4.08	3.38*
12	Citing sources disseminated with comments posted on a dedicated website (open peer review)	2,669	4.39	4.30	4.27	4.22

Note. The lower the number the more important the activity to the respondent. 1 = "essential," 2 = "very characteristic," 3 = "characteristic," 4 = "somewhat characteristic," 5 = "not characteristic."
*$p < 0.05$.

them (Table 9). The journal's impact factor is not important for deciding what to cite for any of the four fields.

Changes in the Fields

Respondents were also asked to rank the extent to which the statements represent what has happened in their research field over the past decade. The scale ranges from 1 = *a great extent* to 5 = *not at all*. The highest ranked statements show an interesting paradox, that digital communication is creating closer ties with researchers, making "it easier for me to judge the trustworthiness of materials" (rated highest), while at the same time "there is an increased pressure to publish and, as a result, there is a flood of poor quality material" (rated a close second). Overall, respondents do not believe that the available metrics make evaluating a source's trustworthiness easier or that there are more unethical practices.

Younger researchers believe that those changes have occurred to a greater extent than older researchers and that

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TABLE 8. Trustworthiness of cited sources by age of respondent.

Ranking	Trustworthiness of the sources you cite	n	Mean age ≤40 years	Mean age >40 years
1	I have no problem citing an article published in an open access journal if it has been properly peer reviewed.	2,907	1.92*	2.02
2	Social media mentions/likes are indications of popularity only, not quality.	2,792	2.28	2.14*
3	Social media mentions/likes are indications of popularity only, not credibility.	2,790	2.29	2.17*
4	From a trust perspective I'm more easygoing in what I read than what I cite.	2,859	2.25*	2.38
5	Usage metrics are indications of popularity only, not quality.	2,805	2.61	2.60
6	Usage metrics are indications of popularity only, not credibility.	2,788	2.66	2.66
7	I prefer to cite articles published in an open access journal only if they are of a reputable publisher.	2,869	2.71	2.75
8	I only cite conference proceedings if there's no other alternative because the work there is still speculative, and, as such, a little unreliable.	2,889	2.71*	2.86
9	I tend to cite people I know because I trust them.	2,956	2.85*	2.96
10	The journal impact factor is important for deciding what to cite.	2,878	2.89*	3.30
11	I don't cite articles published in open access journals because they are of low quality.	2,874	3.75	3.73

Note. The lower the number the more important the activity to the respondent. 1 = "strongly agree," 2 = "agree," 3 = "neither agree nor disagree," 4 = "disagree," 5 = "strongly disagree."
*$p < 0.05$.

TABLE 9. Trustworthiness of sources cited by field of study of respondent.

Ranking	Trustworthiness of the sources you cite	n	Life sciences	Physical sciences	Social sciences	Humanities
1	I have no problem citing an article published in an open access journal if it has been properly peer reviewed.	2,907	**1.83**	2.04	2.03	2.04
2	Social media mentions/likes are indications of popularity only, not quality.	2,792	2.21	2.24	2.19	2.11
3	Social media mentions/likes are indications of popularity only, not credibility.	2,790	2.21	2.24	2.19	2.11
4	From a trust perspective I'm more easy-going in what I read than what I cite.	2,859	2.38	2.42	**2.27**	2.33
5	Usage metrics are indications of popularity only, not quality.	2,805	2.63	2.62	2.60	2.44
6	Usage metrics are indications of popularity only, not credibility.	2,788	2.70	2.68	2.63	2.51
7	I prefer to cite articles published in an open access journal only if they are of a reputable publisher.	2,869	2.69	2.79	2.74	2.72
8	I only cite conference proceedings if there's no other alternative because the work there is still speculative, and, as such, a little unreliable.	2,889	**2.61**	2.96	2.76	3.13
9	I tend to cite people I know because I trust them.	2,956	2.92	**2.87**	2.90	3.08
10	The journal impact factor is important for deciding what to cite.	2,878	**3.03**	3.14	3.13	3.34
11	I don't cite articles published in open access journals because they are of low quality.	2,874	3.83	3.67	3.70	3.74

Note. The lower the number the more important the activity to the respondent. 1 = "strongly agree," 2 = "agree," 3 = "neither agree nor disagree," 4 = "disagree," 5 = "strongly disagree."
Bold indicates statistical significance at the 0.05 level.

(a) there is an increased pressure to publish and as a result there is a flood of poor quality material (2.49 vs. 2.60), (b) more researchers entering the field has raised standards (2.52 vs. 2.94), (c) easily available metrics make the evaluation of trustworthiness easier (2.79 vs. 3.14), and (d) closer ties with researchers in the field have made it easier to judge the trustworthiness of material (2.37 vs. 2.57).

There are many differences between respondents' subject area and perception of changes in their field. Respondents in the physical sciences believe that (a) there is an increased pressure to publish, resulting in a flood of poor-quality material, and (b) there is a less strict/less rigorous peer-review process, resulting in a flood of poor-quality material available (Table 10). Social scientists are more concerned with unethical practices and also believe that, because there are more researchers in the field, standards have been raised.

Conclusions

Although scholarly communication has undergone tremendous changes over the last few decades, creating new modes and technologies for accessing information and

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TABLE 10. Mean ranking of statements on change in research fields over past decade and differences by field of study of respondents.

Ranking	Statement	n	Life sciences	Physical sciences	Social sciences	Humanities
1	The closer ties with researchers in my field, enabled by digital communication, make it easier for me to judge the trustworthiness of material.	2,678	2.49	2.41	2.51	2.60
2	There is an increased pressure to publish, and, as a result, there is a flood of poor quality material.	2,770	2.62	**2.37**	2.60	2.64
3	There are more outlets, it is easier to get published, and, as a result, there is a flood of poor quality material.	2,730	2.68	**2.48**	2.79	2.78
4	More researchers entering the field have raised standards.	2,619	2.73	2.89	**2.71**	2.74
5	There are more unethical practices (e.g., plagiarism, falsifying, fabricating, citation gaming).	2,227	2.86	2.89	2.83	3.03
6	Easily available metrics make the evaluation of trustworthiness easier.	2,470	**2.89**	2.96	3.01	3.37
7	There is a less strict/less rigorous peer review process, and, as a result, there is a flood of poor-quality material.	2,716	3.03	**2.84**	3.11	3.15

Note. The lower the number the more important the activity to the respondent. 1 = "a great extent," 2 = "somewhat," 3 = "a little," 4 = "very little," 5 = "not at all."
Bold indicates statistical significance at the 0.05 level.

reaching readers, trust in quality remains the foundation in decisions about what to read, what to cite, or where to publish. Trust is imparted by numerous criteria, including journal name, sound content, and credibility of the author.

However, with all of the changes in dissemination channels, the methods and criteria used to justify trustworthiness and quality remain surprisingly traditional. Content clues, including checking for soundness of ideas, quality of figures and tables, and reading an abstract remain highly ranked as decision factors when deciding to trust scholarly resources. Traditional criteria such as journal ranking remain essential, even though this is criticized by the very researchers who rely on it.

Respondents agree that checking whether arguments and logic are sound and checking the credibility of the data are both extremely important when assessing the trustworthiness of a source. Reading the abstract is also an important factor to ensure the credibility of a source. Peer-reviewed journal articles are seen as the most trustworthy sources of information, and the accessibility of this information remains extremely important for scholars whether in print or online. The relevance of the subject matter is more important than whether the article is highly cited or authored in a country known for the quality of its research. Scholars today still believe that they have to publish in high-impact journals, traditional sources, and international journals to meet the policies or expectations of their institutions and to further their careers. The most agreed upon statement is that peer-reviewed journals are the most prestigious place in which to publish and are likely to contain high-quality material. Respondents also agree with the statement that people who do not have tenure have to publish in good journals to build a reputation. The majority of respondents do not agree that blogging is a good way to test veracity of their ideas or that depositing work in a repository is a reliable way to reach a wider audience.

When asked specifically about OA publications, there are still concerns about quality, even though many believe that OA is the wave of the future, with positive implications for research. Many respondents indicate that these journals make research accessible in countries where access to information is an issue. OA journals, if peer reviewed, are seen as citable resources. Respondents rank OA journals as more trustworthy if peer reviewed than if they are associated with a reputable publisher.

New and alternative options for reading and disseminating research results are not being embraced by a majority of academics. Regardless of the demographic under investigation, traditional peer-reviewed journal articles remain the most trustworthy source of information and the most sought-after outlet for publishing. Newer alternative outlets are not trusted as much as the traditional, established outlets.

There is remarkable consistency in the findings of this study. The issues that are deemed as positive or negative do not change between older and younger researchers, between or among the different academic fields, or with the number of recent publications. As Tenopir et al. (2010) found, when looking for trustworthy sources of information, most researchers do not focus mostly on (a) the author's name, (b) the publisher's name, (c) whether the author's country of affiliation was known for its research, (d) how many times the article had been downloaded, (e) their colleagues' opinions of the articles, or (f) where the article was obtained. The most important aspect of any research article remains the content. There is also agreement that the ease of availability does not trump content when looking at the trustworthiness of information source.

Despite all the positive publicity regarding OA, it has negative connotations regarding quality for many of the respondents. Respondents do not always associate OA with traditional peer review, and therein lies the problem with its acceptance. Without peer review, research outputs are not as

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trustworthy or reliable. For instance, there is almost universal agreement that writing about research in a blog and/or tweeting about research will not be looked at positively. Other alternative options are also not deemed trustworthy, including disseminating research on a personal website, publishing first in a subject repository, or using other types of social media to disseminate research.

Ethical considerations are evident with the responses to the survey. Researchers rate the following activities poorly: (a) citing one's own work to improve one's citation ranking, (b) citing papers in the journal to which an article is submitted for publication to enhance the likelihood of acceptance, (c) citing papers mentioned by reviewers to increase chances of acceptance, (d) citing sources disseminated with comments posted on a dedicated website (open peer review), (e) citing a pre-print that has not yet been accepted by a journal, (f) citing only sources published in developed countries, or (g) citing the published version of a record but reading another version found on the open web.

Although the climate within which scholars work has changed, their needs have not. The changes over the past decade or so seem to have influenced each field similarly. Many respondents in each field think that there are more outlets, resulting in more poor-quality material, and that there is an increased pressure to publish. Respondents in each field do not think easily available metrics make the evaluation of trustworthiness easier or that there is a less strict/less rigorous peer-review process.

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Appendix

Questionnaire

Aim of the Survey

We are studying how emerging digital behaviors are challenging and, perhaps, changing concepts of trust and authority in the scholarly world. We wish to determine how researchers assign and calibrate authority and trustworthiness to the scholarly sources and channels they choose to use, cite, and publish in. We are seeking information from you about your behavior as a researcher with special reference to what you trust or find reliable. For more information about this project (funded by The Alfred P. Sloan Foundation) please see our websites at the University of Tennessee, Knoxville, or at CIBER Research Ltd.

Participating in the Survey

This survey will take approximately 15-20 minutes to complete.

You may exit the survey or leave a question unanswered at any time. There is minimal risk attached to your participation. Any details about you, your work situation, and your organization will be kept completely confidential. Survey results will be kept under password protection for three years following the survey. Any papers or conference presentations will be based on the aggregated data without direct links to an individual survey response. You should be 18 or over to participate in this research.

About us

If you have questions at any time about the study or the procedures you may contact the primary researchers, Professor Dave Nicholas (Dave.Nicholas@ciber-research.eu) or Dr. Suzie Allard, 451 Communications Building, 1345 Circle Park Drive, Knoxville, TN 37996; 865 974-1369; sallard@utk.edu). If you have questions about your rights as a participant, contact the University of Tennessee's Office of Research Compliance Officer at (865) 974-3466.

Prize Draw

At the end of the survey there is an opportunity to enter your e-mail address to enter a prize draw to win an iPad Mini. Your e-mail information will not be connected to your survey answers. The prize draw will be on July 29, 2013.

Informed Consent

By clicking NEXT PAGE and completing the survey, you are indicating that you have agreed to take part in this research and give permission for us to gather and analyze the answers you providem

Using and Reading Information

1. How important do you consider each of these activities when deciding what information to use/read in your own research area?

[Select Extremely Important, Very Important, Important, Somewhat Important, or Not Important for each of the following]

- Reading the information source (article, book chapter, etc.) in its entirety
- Reading the abstract
- Checking the figures and tables
- Checking the methods
- Checking to see the means by which it has been disseminated/published (e.g., in a subscription journal, an Open Access journal, a repository, a blog)
- Checking whether the source is indexed by an authoritative indexing body (e.g., ISI, PubMed)
- Checking the name of the author
- Checking the name of the journal
- Checking the name of the publisher

Using and Reading Information – Continued

2. How important do you consider each of these activities when deciding what information to use/read in your own research area?

[Select Extremely Important, Very Important, Important, Somewhat Important, or Not Important for each of the following]

- Checking to see whether the data used in the research are credible
- Checking whether the arguments and logic presented in the content are sound
- Checking whether the author's country of affiliation is known for its research
- Checking to see whether it is peer reviewed
- Checking to see how many times it has been downloaded/accessed
- Taking into consideration colleagues' opinions of it
- Taking account of where it was obtained from (e.g., publisher's website, university catalogue, search engine)
- Other please specify:

Trustworthiness of Information Sources

The following statements are what some interviewees made to us. We would like to know whether you agree or disagree with them.

3. To what extent do you agree/disagree with the following statements concerning the quality and trustworthiness of information sources?

[Select Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree, or Don't know for each of the following]

- Peer reviewed journals are the most trustworthy information source.
- The journal's Impact Factor is important for deciding what to read.
- Wikipedia has become more trustworthy over the years.
- Open Access publications that are peer reviewed are trustworthy.
- I am very likely to read an article recommended to me by a colleague.
- If the information is not central to my research area, the ease of availability of a source is more important than its quality.
- My main criterion for finding out if a source is trustworthy is the content itself (whether it makes sense, it is consistent with what I believe etc.).
- When pressed for time, the ease of availability of a source over-takes considerations about its quality.

Disseminating Your Research

4. As an author, how important are the following attributes of an outlet when deciding where to disseminate/publish your research work?

[Select Extremely Important, Very Important, Important, Somewhat Important, Not Important or Don't Know for each of the following]

- It is published by a traditional scholarly publishers.
- It is Open Access.
- It is indexed by reputable/prestigious abstracting/indexing databases, such as ISI or Scopus.
- It is highly cited.
- It is peer reviewed.
- It has both an online and a print version.
- It is based in a country known for the quality for its research.
- It has a reputable Editor/Editorial Board
- It is highly relevant to my field.
- It is published by a society in my field.

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Effect of Policies on Where You Publish

5. Do research policy directives/mandates (e.g., national, university, departmental) influence where you publish your research?

☐ Yes, heavily ☐ Yes, somewhat ☐ Not at all ☐ I am not aware of any mandates

6. You said yes to the previous question, how are you influenced? Are you pressed to:

[Select Extremely, Very, Moderately, Slightly, or Not at all for each of the following]

- Publish in traditional sources (e.g., journals and monographs)
- Publish in high impact factor journals.
- Publish in sources that have a hard copy version.
- Publish in Open Access journals.
- Publish in national/local journals.
- Publish in international journals.
- Write a blog and/or tweet about your research.
- It is published by a society in my field.
- Other please specify:

Trustworthiness of Places You Publish in

The following statements are what some interviewees made to us. We would like to know whether you agree or disagree with them.

7. To what extent do you agree/disagree with the following statements concerning the quality and trustworthiness of places to publish/disseminate your research?

[Select Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree, or Don't know for each of the following]

- As peer reviewed journals are the most prestigious place in which to publish, they are likely to contain high-quality material.
- People who don't have tenure have to publish in good journals to build up a reputation.
- I publish in journals because a paper placed in a journal obtains a context, becomes part of a "conversation".
- To obtain research grants I have to publish in highly ranked journals.
- I don't publish in Open Access journals because they are of low quality.
- I have no problem publishing in an Open Access journal if it is properly peer reviewed.
- Open Access journals make trustworthy research information accessible in countries where journal subscriptions cannot be afforded.
- I publish in an Open Access journal only if it is published by a reputable publisher
- My own website is central for ensuring the reliable dissemination of my work to my target audiences.

Trustworthiness of Places You Publish in – Continued

8. To what extent do you agree/disagree with the following statements concerning the quality and trustworthiness of places to publish/disseminate your research

[Select Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree, or Don't know for each of the following]

- I use social media (e.g., Twitter, blogs, social networks) to get out information about my research because it is a reliable way to reach my target audiences
- I tend to publish first in a conference proceedings, because it is a reliable way to reach my target audiences
- I tend to publish first in a subject repository (pre-publication database), such as ArXiv, PMC, RePEc, because it is a reliable way to reach wider audiences.
- Depositing a version of my published work in an institutional repository increases usage and thereby helps to build up my professional reputation among my peers.
- Depositing a version of my published work in an institutional repository increases citation and thereby helps to build up my professional reputation among my peers.
- I tend to blog about the findings of my research, which is a good way to test the veracity of my ideas.
- I tend to publish first in a conference proceedings, which is a good way to test the veracity of my ideas

Citing Practices in Your Field

9. How characteristic of your discipline are each of the citing practices listed below?

[Select Essential, Very characteristic, Characteristic, Somewhat characteristic, Not characteristic, or Don't know for each of the following]

- Citing the most highly cited information sources
- Citing the seminal information source published on a topic
- Citing the first information source published on a topic
- Citing the most recent source published on a topic
- Citing one's own work to improve one's citation ranking (e.g., H-Index)
- Citing papers in the journal to which an article is submitted for publication to increase chances of acceptance
- Citing papers mentioned by reviewers to increase chances of acceptance

10. How characteristic of your discipline are each of the citing practices listed below?

[Select Essential, Very characteristic, Characteristic, Somewhat characteristic, Not characteristic, or Don't know for each of the following]

- Citing non-peer reviewed sources (e.g., personal correspondence, newspaper articles, blogs, tweets)
- Citing a pre-print which has not yet been accepted by a journal
- Citing sources disseminated with comments posted on a dedicated website (open peer review)
- Citing, if possible, only sources published in developed countries
- Citing the published version of record, but reading another version found on the open web

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Trustworthiness of the Sources You Cite

The following statements are what some interviewees made to us. We would like to know whether you agree or disagree with them.

11. To what extent do you agree/disagree with the following statements concerning the quality and trustworthiness of the sources you cite?

[Select Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree, or Don't know for each of the following]

- From a trust perspective I'm more easy-going in what I read than what I cite.
- Usage metrics are indications of popularity only, not quality
- Usage metrics are indications of popularity only, not credibility.
- Social media mentions/likes are indications of popularity only, not quality
- Social media mentions/likes are indications of popularity only, not credibility
- I tend to cite people I know because I trust them
- I only cite conference proceedings if there's no other alternative because the work there is still speculative, and, as such, a little unreliable
- I don't cite articles published in Open Access journals because they are of low quality
- I have no problem citing an article published in an Open Access journal if it has been properly peer reviewed.
- I prefer to cite articles published in an Open Access journal only if they are of a reputable publisher
- The journal impact factor is important for deciding what to cite.

Changes in Your Field

12. To what extent do these statements represent what has happened in your research field over the past decade or so?

[Select A great extent, Somewhat, A little, Very little, Not at all, Don't know for each of the following]

- There are more outlets, it is easier to get published and as a result, there is a flood of poor quality material.
- There is a less strict/less rigorous peer review process and as a result, there is a flood of poor quality material.
- There is an increased pressure to publish and as a result, there is a flood of poor quality material.
- More researchers entering the field have raised standards.
- There are more unethical practices (e.g., plagiarism, falsifying, fabricating, citation gaming).
- Easily available metrics make the evaluation of trustworthiness easier.
- The closer ties with researchers in my field, enabled by digital communication, make it easier for me to judge the trustworthiness of material.

Your Subject Area

13. Which of these broad subject headings best describes your subject area of interest?

[Tick only one]

☐ Agriculture and Food Science	☐ Education	☐ Mathematics
☐ Area Studies	☐ Engineering and Technology	☐ Medicine, Allied Health and Veterinary Science
☐ Arts	☐ Environmental Sciences	☐ Neuroscience
☐ Behavior Sciences	☐ Geography	☐ Pharmacology, Toxicology and Pharmaceutics
☐ Biochemistry, Genetics and Molecular Biology	☐ Humanities	☐ Physics and Astronomy
☐ Biological Sciences	☐ Immunology and Microbiology	☐ Politics and International Relations
☐ Chemistry and Chemical Engineering	☐ Law	☐ Public Health and Social Care
☐ Computer Sciences and IT	☐ Library and Information Science	☐ Social and Cultural Studies
☐ Earth and Planetary Sciences	☐ Materials Science	☐ Tourism, Leisure and Sport Studies
☐ Economics, Business and Management	Other please specify:	

About You

14. Where do you work?

☐ Research-intensive University	☐ Research Institute	☐ Self-employed (e.g., consultant)
☐ Primarily Teaching University/College	☐ Government	☐ Retired
☐ Hospital or Medical School	☐ Commercial organization	Other please specify:

15. Are you mainly a

☐ Full-time researcher	☐ Full-time faculty member	☐ Student
☐ Part-time researcher	☐ Part-time faculty member	☐ None of these

16. Are you or have you been a journal editor?

☐ Yes ☐ No

17. Are you or have you been a member of the editorial board of a journal?

☐ Yes ☐ No

18. Do you review articles for journals?

☐ Yes ☐ No

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19. How many years' experience (working in the field) do you have as a researcher?

Please write only a number like 0, 1, 12, etc.

20. Roughly how many journal articles have you published as author or co-author in the past three years?

Please write only a number like 2, 5, 11, etc.

21. In which country are you based? (choose from the drop down menu)

22. How old are you?

Please write only a two-digit number like 36, 54, etc.

23. Gender

☐ Female
☐ Male

Your Comments

24. Finally, is there anything you would like to add about the issues of trust and reliability in using information?

25. If you would like to be entered into our Prize Draw and stand a chance of winning an iPad Mini, please enter your e-mail address below. The draw will be on July 29th.

Your e-mail will not be used for any other purpose and it will not be passed on to any third party.

Thank you very much for your time.

Please click on the "Survey Completed" below to safely exit the survey.

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