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Trust in reading, citing and publishing

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1. Introduction

Selected findings from a recent project funded by the Sloan Foundation on the role that *trust*, or more specifically judgments of trustworthiness and authority, play in how academic researchers decide what to read, cite, and where to publish were presented at the 2014 NFAIS Annual Meeting. This project looked not only at the current role of trust in traditional sources such as journal articles and books, but also how academics perceive the role of trust has changed for them recently with a wider variety of choices for scholarly information. Full results from various parts of this international study are reported in [7] (focus groups), [16] (interviews) and [4] (international questionnaire). Additional analyses assessing geographical differences [3], citation determinations [14], and trustworthiness of open access [17] and social media [1] have also been reported.

The project had two main goals, (1) to look at the current situation in how academics assign authority and trustworthiness to sources they read, cite, and publish in and (2) to see how behaviors and attitudes of academics may be changing. Research questions guiding the study included such things as:

- Does assignment of authority and trustworthiness to scholarly information differ when the purpose is to read, cite, or publish?
- Does assignment of authority and trustworthiness differ by demographics of academics, including age and subject discipline?
- Do academics perceive a difference in their view of trust since various search engines and gateway services allow academics to choose information based on access, speed, and visibility in addition to traditional established metrics of quality?
- Since social media increases communication between researchers and has the potential to challenge established channels, how do today's academics assign trust to all types of information and are these assignments of trust changing?

From previous studies we know that perceived quality, reliability, or trustworthiness are prime criterion scholars use in the discovery process (finding information) [8] in the information management process (separating dispensable from indispensable relevant material) [8], in the citation process (formally using information) [9,15] and in the dissemination process (where and how researchers choose to have their work published) [5]. In all of these processes, however, a variety of complex factors enters into decision-making and judging trustworthiness [7,10]. In this study, we looked at the same individuals in each of these different functions or roles to establish if they have different criteria for each of these

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Methods and participants in the Trust Project, 2013			
Focus groups	8 focus groups	6 focus groups	14 focus groups
	(36 participants)	(30 participants)	(66 participants)
Interviews	45 participants	42 participants	87 participants
International survey			More than 3,600 respondents

Table 1

processes. Additionally, we wanted to determine if they have different criteria for different types of materials (journal articles vs. blogs, for example), and if they perceive these are changing or will change in the future. We also set out to discover how academics make decisions based on perceived trustworthiness when seeking, selecting, citing and disseminating scholarly content and how they think that has changed with the advent of new types of resources.

Between the US and the UK we conducted 14 focus groups (with a total of 66 participants) and 87 interviews. A worldwide survey resulted in participation from over 3,600 researchers (see Table 1). This report also interweaves some findings from Tenopir and King's recent surveys of reading patterns among academics in the UK, US and Australia [11-13]. The Tenopir and King studies look mostly at reading patterns such as where readings are found, what is read, outcomes and use and value of reading rather than specifically at trust. These studies do not examine citing or publishing patterns, but they do provide some context on issues of trust.

2. Context

From over 35 years of studies, we know that academics read many articles, on average in the UK, US and Australia over 20 articles per month, plus an average of eight readings from books or book chapters and eight to ten readings from other publications. There is wide individual variation and, of course, this varies by subject discipline - medical academic staff read many more articles (an average of 31 in Australia for example) and Humanities academic staff read many more books (an average of 14 in Australia for example) per month.

This reading represents a huge investment in time. If we assume the previous month is a typical month, extrapolated up to a 12-month year, this means that academics in the US spend an average of nearly two months of eight-hour days reading articles, books, and other scholarly materials. Of course, one measure of value to researchers is *exchange* value or how they spend their valuable time.

Traditional metrics of trust for traditional sources such as journal articles are journal name, journal reputation or impact factor, and reputation of the author. A known and respected author in a highly regarded journal rates the highest in trust metrics, although, when deciding what article to read, other factors such as whether the article is free to the reader are also important [10].

The trust study sought to discover if traditional trust metrics still apply and, if they are the same for reading, citing, and deciding where to publish.

3. Results

In the focus groups held with academics in the US and the UK, several reality checks emerged quickly. A few academics said they will read many things they "trust" that they would never cite (e.g. Wikipedia). Interviewees maintained that social media such as blogs are only cited when no reference was found to more formal channels such as a journal or book, though they are often used as sources for ideas [16]. There are more politics and other factors influencing what they cite and where they publish than there are for reading. Academics say they cite to protect themselves and to add an aura of "trustworthiness" to a publication, and publish where it will best help their career or where they can get published. These complicating factors tell us that it is important to look at reading, citing, and publishing separately.

4. Reading results

To determine trustworthiness of what to read, academics in focus groups and interviews said they use many clues. Academics read the abstract [7] and assess the methodology. They check for credible data and sound logic, which requires expertise in the subject matter, and they look at a source's references. Additionally, academics take into consideration their colleagues' recommendations, including individual and trusted tweets or blogs [7,16] and they read the works of authors with whom they are familiar [7,16].

Some traditional metrics of quality came up over and over again in these studies. Academics usually associate the peer review process with quality [7,16]. They also report that familiarity with a journal [7, 16] and the journal's impact factor also influence their assessment of trustworthiness of articles. Based on results from the focus groups, researchers tend to use impact factor to determine the trustworthiness of articles outside their field of study where they are less familiar with the authors [7].

Looking at abstracts, methodology, and references and checking for the article's data and logic are navigational clues or metrics. Considering colleagues' recommendations and articles written by familiar authors are socially-based metrics, and peer review, journal name and journal impact factor are traditional metrics. Academics use a complex mix of interacting with the content, relying on recommendations or knowledge of an author, and time-tested metrics that are tied to a journal brand name or reputation. In an e-journal environment all of these factors work together to help readers select trustworthy content with which to spend their time.

5. Citing results

The picture is different when academics judge trustworthiness and quality of a source to cite. The top five reasons why interviewees in the US and UK think a source is trustworthy for citing are:

- 1. The author is known and trusted
- 2. The journal or conference is known and trusted
- 3. It is a seminal work in the field
- 4. The findings support the methodology of their research
- 5. The research group or institution is known and trusted.

Academics also cite articles because reviewers or editors have recommended them or the articles are cited a lot. Some academics look for articles without an agenda or articles in an authoritative or trustworthy source. Additionally, they cite articles that they or their co-authors wrote. In the focus groups researchers said they feel more secure in citing peer-reviewed material and, journals with known rigorous peer reviews are especially trustworthy [7,16]. Peer review came up many times as a trust metric for citing and publishing. And, academics said they rarely cite a source that has a convincing alternative argument, an informal source, or even information from a well-known website.

6. Publishing results

The picture for publishing is different as well. Academics say they use traditional metrics more often when determining where to publish than when citing or reading. This emphasis on traditional metrics is generally due to outside influences or political reasons. Over half (56%) of survey respondents said they are heavily or somewhat influenced by institutional research policy directives or mandates when selecting a publication venue. Traditional metrics are also said to be important because the university uses them when giving tenure or promotion credit. Some researchers reported that they care less about the trustworthiness of the journal and more about if it will help them get tenure; older researchers may be more likely to publish in more "innovative" journals or sources because they already have tenure.

Also important when deciding where to publish is trust in the audience. Authors ask themselves, "Who will read the article?". They want to publish in a journal that has the intended audience, but they admit that sometimes tenure requirements can interfere, causing their decision to be influenced more by tenure considerations than seeking the most appropriate audience.

The likelihood of getting published is a reality check that academics must make, and it is often more powerful than trust. Academics want to publish in top-tier journals, but since there is less chance of getting published in top journals, they may go down the list until they find a journal that is more likely to publish their articles. Some expressed the reality that there can be too much competition in the top journals.

7. Demographic differences

Whether it is trust for reading, for citing or for publishing, there are some significant differences based on subject discipline. For example, from the international survey, researchers in the life sciences are more likely to use article content to determine trustworthiness for reading compared to researchers in other fields. They rely more heavily on peer review for determining trustworthiness for reading and are more willing to cite and publish in peer-reviewed open access journals than researchers in other fields. On the other hand, researchers in the humanities say they are more likely to read the entire information source and rely on journal and author name-recognition to determine trustworthiness for reading. They also feel the most pressure to publish in traditional scholarly sources.

There are also differences based on the age of the academic when applying trust metrics to reading. Older academics¹ rate the importance of checking the paper for sound logic, peer review and the author's name significantly higher than do younger academics. Younger academics rate the importance of reading the abstract, relying on colleagues' opinions, checking if the journal is indexed by authoritative indexing body, and looking at number of downloads significantly higher than do older academics. Even though there are differences in how highly the different age groups ranked the items, regardless of age, the two most important criteria for reading are: "1. Checking if the arguments and logic presented in the content are sound" (rated 1.58 by older vs 1.77 by younger on a scale of 1 to 5 with 1 being most important) and "2. Reading the abstract" (rated 1.86 by younger vs by 1.96 older on a scale of 1 to 5 with 1 being most important).

There are also age differences for how trust enters into publishing and citing. Younger researchers say they are more likely to trust nontraditional methods of dissemination. They also feel more pressure

¹For analysis, we divided the survey population into two groups: younger academics (those less than or equal to 40 years old) and older academics (those greater than 40 years old).

than older researchers to publish in highly-ranked journals in order to obtain research grants. Younger researchers are more likely to cite people they know because they trust them and to cite open access journals provided that they are properly peer-reviewed.

Younger academics are more likely to agree that in targeting an audience, their own personal website is a reliable dissemination method (2.97 younger vs 3.27 older) as well as publishing first in conference proceedings (2.91 younger vs 3.16 older). Both younger and older academics neither agree nor disagree that using social media is a means of promoting work to reach a target audience (3.38 younger vs 3.74 older) or that publishing in a subject repository is a reliable way to reach wider audiences (3.35 younger vs 3.37 older).

Both younger and older academics agree that depositing a version of published work in an institutional repository increases usage (2.60 younger vs 2.84 older) and citation (2.57 younger vs 2.84 older) and, thereby, helps to build professional reputations among peers, though younger academics agree more strongly.

There are some differences in citing as well. Younger academics are more likely to cite people they know because of proven trust (2.85 younger vs. 2.96 older). They are also more likely to cite an open access journal if it has been properly peer reviewed (1.92 younger vs 2.02 older). In fact, the quality of an open access journal's peer review process is often key to overcoming any instinctual distrust that many interviewees had towards open access journals [16].

8. Peer review

Across the board (young and old, all disciplines, all countries) a majority of researchers said they use the fact that something is peer-reviewed to determine trustworthiness in what they read, cite, and publish.

However, there are some misgivings or confusions about the peer review process. In the open-ended comments in the surveys and in the interviews and focus groups, oftentimes skepticism in peer review or chinks in the peer review armor was expressed. A researcher in medicine and allied health, 48 years old, and based in the UK, contended, "I think it is difficult to publish data which goes against current trends in high impact peer review journals". Another researcher from Romania, retired and 68 years old, pointed out the influence of 'names' within a field, commenting, "I am sure the fame of the author has an influence on accepting the paper for publishing". A humanities researcher, 63 years old, from the UK worried about potential bias among peer reviewers, "Whilst peer review is essential, it sometimes worries me that reviewers' opinions can be skewed by their own personal and professional prejudices . . .".

Many open-ended comments touched on nuances of peer review, in particular blind peer review, with several saying peer review should be completely blind. Participants in the focus groups frequently criticized the peer-review system for being biased and not transparent enough [7]. Interviewees were concerned about bias among peer reviewers as well as academic politics, calling for extra scrutiny for journals that could be considered problematic by other academics [16].

9. Impact factor

In addition to peer review, the importance of and concerns about impact factor of a journal in which an article is published is a traditional metric that comes up often in focus groups, interviews, and openended comments. A majority of respondents to the survey rate impact factor as more important for deciding where to publish than in deciding what to read or cite. In focus groups and interviews, scholars often said they recognize the negatives as well as positives of impact factor. Some say they recognize that low-quality articles could be published in high impact factor journals and that high impact factor journals may lack innovative and fresh papers.

On the whole, younger academics rate their trust in impact factor for reading and for citing more highly than do older faculty. On average, older researchers neither agree nor disagree that a journal's impact factor is important for determining what they read. While younger researchers do not strongly agree that impact factor plays a role in determining what they read, they do tend to agree with the statement more than older researchers. Both younger and older researchers on average are neutral about whether impact factor is important for determining what they cite. However, younger researchers tend to lean toward agreeing with the statement, whereas older researchers tend to lean toward disagreeing.

Researchers note that the impact factor system is not perfect and that they must weigh different factors when assessing the trustworthiness of an article. For example, is a well-known author in a journal with a low impact factor more or less trustworthy than an unknown author in a high impact factor journal? On average, researchers of all ages agree that impact factor is important for determining where to publish. In the focus groups, younger researchers were especially aware of metrics and said they exercise caution when reading, citing and publishing because they do not want to make a wrong move early in their careers. Many however, implied that they do not embrace these metrics, but rather feel like 'slaves' to the system [7].

Academics had much to say about impact factor as a way to establish trust for reading, citing, or, especially, publishing. Their comments are both positive and negative (and often a mix that recognizes it as imperfect, but better than nothing). The main points are that impact factor is not obsolete and it is widely recognized. For instance, a 66 year-old professor of anesthesiology from the US laments, "It's an imperfect method, but it's the only one we have". A US assistant professor in education, 37 years old, expressed some skepticism over the continued relevance of impact factor, "My tenure committee cares [about impact factor], but no one else does". However, other researchers acknowledged value in impact factor, though they expressed some reservations as well. A 52 year-old senior research analyst in biophysics from the US explained, "It's good because you want people to pay attention to your work, BUT high impact factors do not always have the right audience for those who would use your work". An education student, 38 years old, also from the US, contended that researchers must look at more than impact factor in evaluating journals, "I have found that while impact factor and reputation are reasonably good indicators of overall empirical quality, they are insufficient by themselves to judge the quality of the findings of any given study".

10. Altmetrics and change

In contrast to the widespread familiarity of impact factor, the term altmetrics is not yet widely known. Participants in the US focus groups were not asked explicitly about altmetrics and the term did not come up; therefore, the following are based on findings from the UK focus groups where the term was introduced explicitly. Most participants in the focus groups were unfamiliar with concept. Others were skeptical of what the various altmetrics actually mean or if they mean anything to readers in particular. Although they did not use the term altmetrics in the US, some alternative metrics were mentioned. Some US interviewees said they like seeing the number of downloads or viewings of their article in open access journals like PLOS. Some were skeptical, however, saying just because someone views an article doesn't mean they think it is of high quality or trustworthy. However, more participants said they do like metrics like downloads, page views, and more that can be quickly understood. And although it was not labeled as altmetrics, one researcher, a 40 year-old psychology adjunct professor from the US, summed up trust in a networked world as "connectiveness' through [the] name of [the] friend who sent the link. You need to connect to a source to have trust. If information is isolated, just floating out there, I don't trust it, but if it is connected to others then I trust it.".

In response to the question: Have digital communications changed how trust is determined? We found uncertainty, but an indication that things have changed and will continue to change in some ways. We found evidence that researchers are often more cynical as they get older. They see the politics and competition that can interfere with academic pursuits.

11. Open access

There also seems to be a fair amount of confusion or uncertainty about open access. One journal name, PLOS, was mentioned by researchers in several focus groups as trustworthy, so brand name can overcome mistrust of the open access model. Common thoughts expressed about open access are that it is too expensive and of lower quality than traditional journals. The lower quality associations may be due to the fact that some researchers believe that open access journals do not have an appropriate peer review system [7].

Researchers also associate open access with a quick publication time. Additionally, many researchers from the focus groups thought that open access journals are disseminated by new publishers out to make money. They did not realize that many open access journals are distributed by traditional publishers [7]. There is some evidence of a backlash to the growing number of open access publishers, many of whom aggressively contact authors via email. As one survey participant said: "I never worried about the publisher before because there were only a few. Now there are so many, and some that are even scams . . . that I am less trusting of unfamiliar journals than I was five years ago".

Younger researchers noted in the focus groups that they like the idea of open access journals, but are afraid to cite or publish in one because they are not yet main stream and they fear these actions may threaten their reputation [7].

12. Social media

In Tenopir and King surveys in the UK in 2011 and US in 2012 we wanted to find out information about the uptake of social media for scholarly research information [12,13]. To do so, we asked, "How often do you read, view, or participate in each of the following electronic or social media tools for work related purposes?".

Blogs, videos such as YouTube, and user comments were the most common social media tools used by academics in the UK in 2011, while in the US, blogs, social networking, and shared videos/YouTube were the most used in 2012 (the last more for teaching than research). But most use was still occasional in both the UK and US.

As with other topics, the trust project revealed many mixed comments about social media, showing that researchers are thinking about it, but there is not yet a consensus. They do not so much as disagree with each other as many have yet to make up their own minds, showing perhaps a growing sophistication or nuanced view. Many see value in using social media. A 54 year-old US assistant professor of pharmacology said, "I use Wikipedia to remind myself of what I once knew". A 27 year-old doctoral student in politics from the US stated, "Social media can make top-tiered research more accessible". The doctoral

student continued to explain a more nuanced opinion, "There are different levels of quality of tweets. I don't cite Twitter, but I may use a report linked via Twitter". A 68 year-old economics professor from the US finds the varied quality of material found on social media troubling, "Same issues with social media as with art. We may pretend to know what is 'good art', but often we don't really know, so how can you judge quality with no basis?".

A 73 year old professor of computer sciences in the US explained his unease that social media and self-publication, combined with the pressure to publish, has negatively impacted the quality of scholarship, "[The] proliferation of sources, increased pressure to publish to survive, proliferation as well of publishing outlets, including blogs, social media, and self-publication means – all have contributed to a lowering of standards as well as increased difficulty in establishing agreement on output quality". Another US professor in chemistry, in her fifties, observed, "It is hard to determine what is not trustworthy in social media". Likewise, a researcher in statistics, also in her fifties and from the US, expressed caution in sharing information over social media. She questioned the quality of research found through such sites as FaceBook and Research Gate, asking, "Where did the information come from?". Another US professor of political science, in her thirties, said that she avoids social media and focuses on peer reviewed scholarship, because of the issue of quality, claiming, that she "[doesn't] find it to be a reputable academic source and [is] not inclined to do so".

On the international trust survey, where 1 = strongly agree and 5 = strongly disagree, the social media statements with the highest level of agreement were: "Social media mentions/likes are indications of popularity only, not quality" (average score of 2.20) and "Social media mentions/likes are indications of popularity only, not credibility" (average score of 2.22). None of the others scored better than a 3, with the next most-agreed-on statement: "I use social media to get out information about my research because it is a reliable way to reach my target audiences" (average score of 3.54). Clearly, social media sources do not yet equate to quality or trustworthiness for scholarly content.

All of these studies and methods show that a majority of researchers are engaged with social media at least occasionally for work-related purposes. Most said they are more critical and hesitant about trusting these sources for reading or citing; however, they said they try to use many of the same standards to judge quality of social media as they use for traditional sources. They are less trusting because there is no standard way to judge quality. For publishing they are less likely to trust social media outlets because they are not rewarded by university or tenure committees.

13. Conclusions

This multiple-methods international study of the role of trust in reading, citing, and publishing shows that some things are changing and there are some doubts about traditional metrics, but many attitudes toward trust are not changing quickly because the picture is very complex. Traditional metrics (e.g., impact factor) are still generally trusted for reading, citing, and, especially, publishing even though flaws are acknowledged. Likewise, peer review is a widespread factor in trust, even with acknowledged problems.

Academic realities complicate the trust picture, as tenure, promotion, and other university policies influence what scholars trust, particularly for publishing and especially early in their careers. Impact factor is more important for publishing than reading or citing, but continues to be recognized as a trust factor in reading, citing and publishing. It is relatively easy to understand and widespread.

Many researchers expressed confusion about open access and its relationship to trustworthiness and quality. This confusion seems to be growing with the recent growth in the number of open access publishers. And, finally, although easy to understand clues are appreciated, scholars say they use traditional navigational clues to judge trustworthiness and quality. They read abstracts, look at the methodology sections, and look at the list of references to determine trustworthiness for reading and citing.

Publishers face the challenge of providing functions and easily understood trust metrics that are meaningful to researchers and to the institutions that employ them. These include traditional things such as impact factor and peer review, as well as structural and navigational tools and abstracts that reveal content.

Recommendations by trusted colleagues and recognition of an institution, author, or journal name continue as trust metrics in reading and citing and they can be better incorporated into e-journal trust metrics that will be understood by a wide-range of researchers.²

About the author

Carol Tenopir, Chancellor's Professor at the University of Tennessee, directs the Center for Information and Communication Research. The 2006 Miles Conrad Awardee, Dr. Tenopir has for many years conducted research on reading and information use patterns of scholars and the information industry.

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