TRUST AND AUTHORITY IN SCHOLARLY COMMUNICATIONS

IN THE LIGHT OF THE DIGITAL TRANSITION （CHINA）[ ]

FINAL REPORT

1 Introduction

The broad aim of this report is to investigate how emerging digital behaviours and services are challenging the concepts of trust and authority in respect to scholarly research. Our interest lies with academic researchers both as producers and consumers and how they deal with the trust and authority consequences of the digital transition, especially, but not exclusively, the impact of social media and open access on their scholarly communications. We were also interested whether there were differences according to subject, country and age/seniority.

2 Background

The origins of this research illuminated by CIBER's exploratory research on Trust in Scholarly Communications conducted in 2012-2013 together with University of Tennessee. The study examined how researchers assign and calibrate authority and trustworthiness to the sources and channels they choose to use, cite and publish in and discussed how they deal with the trust and authority consequences of the digital transition, especially in regard to changing digital behaviors, social media and open access publishing(Tenopir, Nicholas, et al.2013[1]).

China's R&D investment has been growing rapidly in the last 35 years. As a result, research capacity and productivity have grown. Between 2005 and 2012, the number of full-time-equivalent researchers in China increased by 38% (to 314,000). Over the same period, the number of published research articles from Chinese higher-education institutions rose by 54% (to 1,117,742) (Jie Zhang, 2014[2]). The young researcher contributed considerable amount of research output such as scientific papers. As so called Google Generation, those born digital might bring with them new values, perceptions and behaviors which would challenge the establishment and its existing practices, especially in regard to trustworthiness (Rowlands et al, 2008[3]).

With the purpose of examining the behaviours and attitudes of academic researchers as producers and consumers of scholarly information resources in the digital era in respect to how they determine authority and trustworthiness in the source they use, cite and publish in. And in order to compare with the conclusion that CIBER drew from US and UK researchers, this study utilized the same method to investigate Chinese researchers' behaviours and attitudes on trust and authority issues.

3 Research methods

In order to make the results comparable, this study followed the research scope and method that CIBER applied in its previous study. Thus, the following methods were used.

3.1 Focus groups

Voluntary postgraduate students from Wuhan University passed invitations to their supervisors, research partners, paper reviewers and acquaintances. Moreover, though scholarly social networking websites such as emuch.net and bbs.sciencenet.cn, posters of call for participant were spread. For the sake of balancing participants in different disciplines, age and gender, volunteer recruited participants from research fellow unions in the School of Physics and the School of Life Science at Wuhan university respectively. Two groups were held during the period of May 2014 to June 2014. In all a total of 24 researchers attended focus groups. Each group lasted 3 hours and 12 researchers attended. See below for details:

- All the participants are from Wuhan University, 5 of them are research fellows with Phd degrees, 17 are PhD candidates and the rest (2) are postgraduate students. That is to say most of the researchers that joined the group are early career researchers.
- The demographic breakdown of participants

a) Discipline: humanity researchers(7); social scientists(7); physical scientists(5); biological scientists(3); and chemical scientists(2)
b) Age: under30(16); 30-39(7); 40-49(1)
c) Gender: males(14); females(10);

3.2 Critical incident interviews

Interviews were conducted between February 2014 and May 2014. Interviewees could choose to have the interviews conducted face-to-face at a mutually convenient location or remotely via phone or Skype. They were contacted ahead of the interview, provided with a list of questions if requested. A publication published or submitted by them was agreed on for the critical incident element of the interview. The critical incident element concerned references in a recent publication authored by the interviewee. Five citations were identified and interviewees were asked a number of related questions, namely:
- What made them include the citation?
- How they decided whether it was a reliable source?
- How they found the source?

In addition interviewees were asked more broadly about trust in respect to scholarly communications, in particular about changes in information use and publishing and their impact on trustworthiness and reliability of scholarly communications and the use of social media.

Thirty-nine researchers were interviewed by phone or Skype and the interview were recorded for check. The demographic breakdown of interviewees is listed below:
a) Discipline: humanity researchers(3); social scientists(18); physical scientists(10); biological scientists(6); and chemical scientists(2)
b) Age: under30(10); 30-39(27); 40-49(2)
c) Gender: males(22); females(17);
d) Academic status: professors, associate professors (6);PhDs and post-docs(24); postgraduate students(9).

Through the research assistants' help, we recruited more "early career academics" (means PhDs, post-docs and postgraduates in this study). Also, we managed to recruit some "established researchers" through asking the participants to recommend their supervisors and professors.

3.3 Questionnaire survey

In order to make the study results comparable, we used the same questionnaire that CIBER has developed and used in previous surveys, except we translated the questionnaire into Chinese and added one question in the

end of the questionnaire, namely:

- Have you ever published any paper in English language with any international scholarly journals?

However, the research assistant missed this question when he was uploading the questionnaire to Sojump.com. We re-uploaded the questionnaire as soon as we found the mistake, while there had been only over 20 questionnaires received since then. So we failed to get enough information related to this question.

We used Sojump.com, a well-established online questionnaire which has been widely used in China for the survey. The questionnaire went online on the 8th March and closed on the 8th May. In total, 265 respondents completed the questionnaire. In addition, Springer uploaded the same Chinese version questionnaire on SurveyMonkey and sent the invitation letter to its Chinese authors. The questionnaire went online on the 8th of May and closed on the 28th of May on SurveyMonkey. A total of 397 respondents completed the questionnaire. So in total, we've got 662 respondents. To increase the response rate from SurveyMonkey.com, we offered respondents the chance to take part in a prize draw. This was mentioned in the invitation emails and also in the introduction of the questionnaire on the first page. In total 198 respondents entered their emails for the draw. SPSS 19.0 was used for the data analysis.

4 Results

We have drawn together the data from both the qualitative (focus groups and critical incident interviews) and quantitative strands (questionnaire) of the project. In general, the quantitative data provides the big picture and the statistically significant information on diversity and difference, whereas the qualitative data provides explanation, insights and the personal side to things. In this report, we report, we lead sometimes on the qualitative data and sometimes on the quantitative data, and this depends on how this works best for the trust issue being addressed.

The questions are not mutually exclusive and there is some overlap in the answers to the research questions. Thus topics like using and reading information will be discussed in the context of various questions, for instance, those regarding ease of use, social media and diversity.

4.1 Trustworthiness in respect to using and reading scholarly information

With the advent of more and different types of sources, researchers have new

range of choices of using and reading scholarly information sources. According to questionnaire respondents, the most important criteria used to establish the trustworthiness of what they use or read has not changed. Most of the scholars (over 80%) thought that it was quite important to read abstracts when they are using and reading information. The reason might be that the abstract was thought to be useful in making fast evaluations in an extremely busy and crowded digital information environment. Interviewees and focus group participants backed up questionnaire respondents on the importance of abstract. The participants said there was too much published, too little time to read it and the widespread adoption of an information seeking and consuming style best described as bouncing meant researchers have no choice but to depend on abstracts. Some further explained from the perspective of environment changing: printed publication was born for full-text reading while screening and cross-comparisons were made at the abstract level, not at the full-text level. There was opposition too, a few participants said sometimes the abstract was structured and well-written, but the article itself is poor, so abstract cannot be recognized as reliable indicator of content trustworthy.

In most cases, researchers read any paper that was cited by them, but they all agree reading a reference did not mean reading the whole document. Abstract, methodology and the bibliography of the source were the most frequently read when make cite decision. Both experienced and early career researchers thought to read methodology of the reference is an easy way to judge its reliability, although the experienced academics are more confident in their own judgment and more familiar with the top journals and their authors. Next, checking if the arguments and logic presented in the content are sound was rated important above the others.

As interesting are the criteria researchers did not rate highly (in order of least importance): country, colleagues' opinion, publisher, author and platform. It was understandable that the authors' country of affiliation was not important; developing country produced good researcher and high quality papers. But surprisingly, the questionnaire data showed the publisher and author were nevertheless acknowledged to be an important factor when determine what to read. This was quite different from the situation of trustworthiness in respect to citing and publishing. In term of considering colleague's opinion, the questionnaire data showed inconsistent answers: most researchers rated the colleagues' opinion low in question Q1, but they are strongly agreed that they are very likely to read an article recommended by a colleague in Q2. The reason for this need to be studied in future.

Questioned further about the trustworthiness of specific sources and channels researchers agreed that personal recommendation was reliable, then peer reviewed journals were the most trusted information source. Life scientists

were most concerned that what they use was peer reviewed and agreed that impact factor was very important.

Although, as we have heard, researchers laid huge emphasis on peer review, interviewees and focus group participants nevertheless felt that 'internal' trust characteristics, determined by personal inspection, was the best way of establishing what is good to use and read(CIBER, 2013).

Both qualitative and quantitative works showed that nobody will specifically check if the publication was open accessed or not when decide to read and use it. However, even if they wished to, what is not clear is how they can easily discriminate against open access journals, because most abstracts/articles do not come with a sign saying that they are open access (CIBER). In focus groups, researchers had different input; a physical scientist said open access was more about 'free accesses' than 'trustworthy'. "Open access provide an easy availability which is more important than its quality when decide what to read and use", he explained. Some researchers admitted to use papers in institutional repositories even if they were not published, and they didn't thought it was improper.

In respect to criteria that were not thought to be as important for purposes of determining trust, focus group participants and interviewees generally concurred with the questionnaire respondents in pointing to country of affiliation, platform. But they provided different opinions on author and publisher. Researchers in focus group and interview believed the authors' name and the publishers' reputation were important criteria for trustworthy judgment. Normally researchers from the same discipline had the consensus that which publishers have good reputation and publish high quality stuffs. So check the publisher was a quick way to make the first filter. Authors as a criteria to judge the quality of source, worked well when the author was well-known established researchers.

Google scholar was frequently mentioned in focus groups as a start of searching information. Most researchers regarded it as a reliable scholarly information discovery system, although unfortunately it was always blocked in mainland China.

As to peer reviewed journals, which questionnaire respondents rated so highly, most focus group participants were more guarded, expressing the view that it came into play more in considerations where to publish. For usage purposes you could not rely solely on peer review to guarantee quality; it was just part of the trust decision making. A few participants (social scientists) admitted they were not sure which journals were strictly peer reviewed in their field. And some humanities thought the 'real strict peer reviewed

system' had not been established in vast majority Chinese journals in their disciplines.

Moreover, focus group participants and interviewees expressed the same doubts about the value of trust proxies, such as impact factors and download count, and explained why: a) such proxies were easy to be forged; b) impact factor was attached to journals not articles; c) downloads did not mean being read.

4.2 Trustworthiness in respect to citing

According to interviewees, the top five reasons for choosing/trusting a citation were : 1) the reference was recommended by their colleague/professor; 2) the content is supportive to my research; 3) the paper published by high-tier journals; 4) it is the seminal information source on this topic; 5) the papers were mentioned by reviewers (to increase chances of acceptance) ; 6) the research group/institution was known to the researcher; 7) cite papers in the journal to which an article is submitted for publication to increase chances of acceptance. This shows that the institutional trust were important to establish the authority of the source. The exception was when the reference supported their positions. Early career researches feel the pressure to improve their chance of acceptance: they sometimes cite hoc-use citations to support their positions and to give their original ideas more weight. The high-tier journal still enjoys a high level of trustworthy. Most interviewees said that the high-tier journals are always in English language and published by international publishers or foreign institutes. Maybe they were not familiar with the authors but they trust the journal. Some interviewees admitted that their cite decision were based on tenure or university policy pressure rather than their perception of the quality of the source, they said they tend to trust well-known journals because they were not sure about their own judgment on the quality of the source. However, some claimed that they always use their own criteria to decide which references need to be cited.

There were some important disciplinary differences. Humanities believed more strongly than researchers in other disciplines that it was important to cite the first and original sources published on a topic; social scientists believed the most highly cited information sources and literature in western language written by western authors was more important; life scientists more strongly believed in the importance of citing the most recent information source published on a topic; physical scientists thought it was more reliable to cite the resource which open data; and they believed more strongly that: (1) Peer-reviewed journals are the most trustworthy information source; (2) The journal's Impact Factor is important for deciding what to read. Computer

scientists firmly believed that the proceedings published by top tier conference were trustable. Physical scientists were more likely to say Wikipedia has become more trustworthy over the years.

To read abstract is also an important way to select citing reference, but a poor abstract did not mean the reference is unacceptable, as one of the interviewee said: "some authors are just not good at writing abstract." Researchers also looked at a source's bibliography to establish trust. They looked for the citations they expected to see, if the key reference were missing, they would tend not to trust them. When they were not familiar with research or the research was cross-disciplinary, they would "Google" the author or consultant people that they thought might be helpful.

Political issues involved in citing have been identified and rated during the interview conversation: 1) citing review articles as a form of bibliographical shorthand instead of cite all the pertinent reference. 2) citing one's own work to increase one's H index; 3) citing papers mentioned/wrote by the reviewers to increase chance of acceptance; 4) citing papers in the journal to which the manuscript is being submitted to get the credit to improve the chance of acceptance; 5) citing a pre-print that has not yet been accept by a journal. There are argument on: 1) citing the first or the most recent source in the field (even the source is irrelevant to the paper); and 2)cite reference supported their positions(even cite non journal article). In the interviews and also in the focus groups, some researchers took the two type of cite for granted, while some said it was unacceptable and unethical.

Journals were more heavily cited than other publications. Even social scientists cite more journal articles than monographs. Journals known to have rigid peer review processes were especially seen as objects of trust. Peer review was thought of as the main indicator of authority, quality and reliability. If a journal adopted rigorous peer review, researchers would recognize it as a reliable resource. In some disciplines the impact factor is important, interviewees from chemistry and biology study said they tend to cite highly impact factor ranked journals. For social science researchers, when making cite decision, it was the reputation of the journal in the field that was more important than impact factor ranking. As long as being peer reviewed strictly, there were no significant differences between cite open access journals and cite other journals. However, when questions of open access came up, researchers showed a remarkable confusion about the difference between open access and open source, and what are the characteristics that make a journal OA. We will discuss this later in this report. Impact factors were not the only metrics to value the reliability when citing journal papers. Researchers from humanities and social science studies made cite decisions on the basis of personal trust and recommendations: some prestigious

journals don't even get indexed, not to speak of the impact factors. Compared with relevant to the topic, access to full text of the resource, the IF was not that important when researcher cite papers..

Conference papers were cited often in disciplines, such as engineering and computer science, where conference proceedings are an important information source. Conference proceedings were almost always seen as less authoritative than full academic papers, but there is recognition by researchers that some conference proceedings are more trustworthy than others: there is a consensus here within the discipline or field. Particularly, most the researchers agreed that proceedings of international conference are more reliable than other proceedings. Because they believe that the international conferences proceedings papers have been peer reviewed rigorously. Some researchers thought those the international conferences that happened out of China and hosted by western institutes publish more reliable proceedings than conferences happened in China and hosted by Chinese based institutes.

Hardly any researchers cite resources from social media. Scientific social media such as Mendelay were used for searching people and information, not for citing. Researchers in relevant fields interviewed were adamant that social media is not a reliable source for scholarly citing: the postings, discussions and commenting are alterable, and their authors were not recognized specialists in the fields. Postings and discussions on scientific blogs and websites could not be trusted too, because these "publications" had not been reviewed. In the social sciences blogs were very rarely cited in the sense that they represented authority like book or journal citations. Such citations only occurred when there was no appropriate reference from a formal channel such as a journal. Researchers under 35 tend to believe Wikipedia has become more trustworthy over the years.

In regard to finding supporting references for their papers, most researchers agreed that they could find reliable sources through online database and from their institutional library holdings. Interviewees from research universities and national-level institutions agreed that it was relatively easy for them to find and get full text resources. However, academics from teaching intensive universities said their university libraries don't subscribe necessary sources, such as commercial scholarly database. Most of researchers started with Google or Google Scholar then switched to a more specialized database, such as arXiv and PubMed Central. Researchers also complained that the unstable internet speed and the block of search engine (Google) stopped them from reference that they want to cite. Low speed of access to the online journal database and no access to full text online articles became the barriers to cite trustworthy resources. During the focus group, one of the participants stated

that:"Sometimes, compared to the access to full text source, its reliability is not that important." Since the Google has been blocked again recently in May 2014, Bing and Microsoft Academic Research have been used more frequently by Chinese researchers; this can be seen in the interviews and focus groups. But researchers said these two search engine cannot be compared to Google and Google Scholar in the use of searching for appropriate sources in an unfamiliar database. Thus some interviewees used virtual private network and proxy servers to break the block to use Google.

4.3 Trustworthiness in respect to publishing research

There is a great pressure for researchers to publish their research result: their performance and productivity in regard to publishing goes a long way in determining how they are measured and rewarded as researchers. In focus groups, the topic of trustworthiness in respect to publishing research was talked longest. Interviewees admitted that publishing research is not only for communicating with peers, but more importantly, also for getting a degree and position in academia.

When deciding where to disseminate their research work, interviewees would take the relevance to the field as the first characteristic. Not surprisingly, almost everyone saying this was the case. This was followed by whether indexed by reputable/prestigious abstracting/indexing databases, again unanimously agree upon. In focus group, researchers discuss this deeply. They said the existing scientific evaluation system forced them to publish on the indexed database such as SCI and SSCI. They argued that the SSCI does a poor job reflecting the relevance and accuracy of articles because of ideological bias and methodological deficiencies. Being highly cited came third and peer reviewed forth. This is different from the case in citing. When making citing decision, peer review came to the second place of consideration. The characteristics that are not so important when deciding to place a publication are: published by a society the researcher's field, it has both an online and a print version; and it is open access.

The choice as to where to publish is a subject to influences outside a researcher's control. Most (85.2%) of the respondents said they are heavily or somewhat influenced by institutional research policy directives or mandates when they select a venue to publish their research works. Of those that were pressurized, most were pressed to publish in high impact factor journals, international journals and traditional sources (e.g., journals and monographs). Researchers were also pressed but less so to publish in a source which are (also) available in hard-copy. There were not so much pressure to open access publishing, and no pressure to blog or tweet research.

Most(86.8%) researchers felt peer reviewed journals were attractive because they contain high quality content. Around 70% of respondents also strongly agreed that researchers who do not have tenure have to publish in good journals to build a reputation, and that to attract research funds they have to publish in high impact journals. Publishing in highly ranked journals was important for early career researchers to apply funds. Having a reputable publisher was important, especially in humanity studies where monograph were the most important publication. Compared with OA journals, IRs (institutional repository) were more wildly accepted as a dissemination channel for published work. Researchers agreed that IRs could increases usage and citation and thereby helps to build up professional reputation. 40% of the respondents viewed OA journal as an untrustworthy publishing outlet, even when it's been peer reviewed. As an exception, life scientists have no problems with publishing in a peer reviewed OA journal. From focus groups in-depth discussions, we know that many researchers mixed OA publishing with author-paid publishing (pay to get published without peer review process).

Merely one quarter respondents published in conference proceedings to reach their target audience and test the veracity of their ideas. Hardly any researchers felt that their websites or blogs were central to ensuring the reliable dissemination of their research work to their target audience. Social media, as an informal communication tool, was used frequently by researchers, but many said it was not a reliable way to publish scientific work. Even scientific social media such as Mendalay, was not an effective way of placing scientific discoveries. Depositing work in a subject repository first, in order to reach a wider audience, was not very popular.

It was not a surprise that relevance to the field was rated as a top factor when it came to placing research findings. After all, researchers are communicating to a specialized and relatively small subject community. However, the questionnaire and qualitative work also shows that, the pressure to publish in a journal that is indexed by reputable abstracting database or has high IF intervened. Researchers complained that the intervention created by institutional and national research policy had a negative impact on scholarly communication, because it led to a distortion in where articles really should be placed. In specific disciplines, some top-tier journals don't have high IFs or were not indexed by prestigious databases at all. Thus the policy of academic publishing would put more pressure to researchers, especially to those who were in the early stage of their career. One focus group participant said:" What to publish is not important, where to publish is." The other said:" It's a shame that we have to compromise to the system instead of publishing on a suitable journal on communicating basis."

Peer review was ranked the forth place when deciding where to publish research work. There were arguments on peer review. The most frequent criticism was that rigorous peer review systems have not been adopted by quite a number of Chinese publishers or journals that focus on domestic market. More than one interviewees mentioned scholarly journals published by university as an example. It was said that most of university journals didn't send the submissions to outside reviewers to get comments; instead, it was the editor who make the judgment. Some journals declared that they have peer-reviewed process but in fact the process does not work well. Researchers agreed that most international journals have rigid peer review system, especially those journals which rejection rates were high. They also considered that double blind reviewing was not transparent enough and the reviewers were sometimes biased. Rejection rate were mentioned with reference to how hard it was to get papers published with ideal journals. It is also noteworthy that a rare few of early career researchers don't even know there was peer review process in scientific publishing workflow. This reflected that peer review has not been widely adopted by Chinese publishers and journals as we mentioned early.

What researchers liked about the peer review process:
- It improves the standards of publication quality. Suggestions from referees generally improved an article, even if it was rejected.
- Double blind reviewing ensure the reviewers are free to comments and the works are fairly judged.
- It is normal for manuscripts to be sent to more than one external reviewers for comments, thus the author could get diversified feedbacks.

What they did not like:
- The reviewing process is relatively slow. Authors need to wait a couple of months to get the comments from reviewers.
- Sometimes it is inevitable to let low quality articles to be published. Normally, referees are established experts and professors, those people are always busy, and reviewing takes time from their main activities. This was put down to the pressure on reviewers to get the job done quickly; as a consequence, sometimes the referees asked their PhD students or colleagues to review for them.
- Sometime different reviewers came up with completely conflicting views.
- Peer review works poor on papers which discuss interdisciplinary topics. Reviewers, normally are the experienced experts in certain specific field, they may not familiar with interdisciplinary topics.
- It operated too much like a closed-shop, making it difficult for new authors to join.
- The blind reviewing is not actually blind.

Most researchers agreed that although there was a lot of criticism about peer review, it is still the most effective method to control the quality of scholarly publications, and so far, it is not irreplaceable.

Again, disciplinary difference can be seen here, researchers from STM studies were more familiar with peer review, thus they had more to say. And when they were talking about trusted outlets for their work, they were talking almost wholly about peer reviewed publications, including journals and conference papers. Researchers from humanities had relatively limited knowledge about peer review procedure. And they seemed not enamored with peer reviewed journals; some felt it is easy to be lead by bias and ideology. Some social scientists said that they know journal papers need to be peer reviewed before publishing, but not sure if monographs need peer review. Both social scientists and humanities hope that the policy would become more flexible with great recognition of monographs or blog postings.

The questionnaire highlighted that established researchers would like to publish with traditional sources, such as high IF journals and hard-copy monographs, and interviewees provide confirmation of this. The experienced researchers were affected by outside influence and they were more sophisticated in the existing system. They would also recommend their students to submit articles to high impact journals and top-tier publishers. The reason is that high IF journals and good publishers always have effective peer-reviewed process. One of the participant in focus group said: "If the submission got rejected, you just got quality feedback." Experienced researchers also mentioned that there was tacit hierarchy of journals in a discipline which decided that what level of journal was more appropriate for an established researcher. And the hierarchy became the barriers for early career researchers to publish with traditional outlets.

Academics from teaching-intensive universities were less interested in peer review journals. Compared with being published by a highly ranked journal, they prefer to publish in the most relevant place. It is relatively more difficult for them to publish on top journals because they have to spend more time and energy on teaching.

The questionnaire findings showed that researchers thought that open access was a good thing for developing world. They said they would like to publish with open access journals as long as it is peer-reviewed. However, in the interviews and focus groups, researchers revealed very mixed views about the academic value of open access. Although they thought open access was a good way for outreach, they prefer not to publish with open access journals. It seemed that researchers in the social sciences and humanities mixed open access publishing (especially the gold OA model) with author-paid publishing

(no peer review, author pays for the cost thus poor quality content can be published, vanity publishing). Some life scientists and physical scientists confused with open data and open access publishing. In the focus group, only biomedical researchers-the area where open access publishing is strongest, who understand open access comprehensively and more easy going with publishing on open access journals, even in the model of author pay. In spite of being told what open access actually is, others researchers, especially researchers in the applied science and humanities, do not obtain much in the way of research funding and, as a consequence, cannot find the money to pay to publish. Here was a big different between questionnaire findings and focus group discussions, questionnaire showed that they have no problem publishing in an open access journal if it is properly peer reviewed, but in focus discussions most researchers said they would not submitted to open access journals even if it was properly peer-reviewed. However, some life scientists argued that open access or not was not a metric to evaluate the reliability of publishing outlet; a lot of high ranked journals had been open accessed for years.

The other downsides of OA publishing mentioned were:
- Poor quality. It was clearly mentioned open access may open a door for poor quality content to be published. One participant said:" Lower-grade researchers choose open access ways. Open access publications are not a reliable way to publish serious work."
- It was political. There was a sense that (green) open access was being imposed rather than something that was actually needed.
- It created a new form of 'vanity publishing', and the 'who paid will get published' model will lead to academic corruptness.

In the interviews and focus groups, nobody saw social media as an alternative to 'formal scholarly communication', but they admitted that it is a good way to communicate with peers, and to reach out to the public and to practitioners. Researchers from applied science were very interested in reaching the public and practitioner community they worked with; and it may help them to get funds. Also, younger researchers saw social media giving them a way of communicating ideas and information that could not be published in 'formal publications', such as journals and books. Mendelay , ResearchGate and Linkedin were mentioned as examples by younger researchers. One physics scientist said he was always share idea and literature with his research team members on ResearchGate. Not all researchers were interested in reaching the public and practitioner, but all saw an increased role for social media in 'informal scholarly communication' and as a complementary to journals. So far there was no policy pressure in using social media.

4.4 Influence of easy access

Easy access to resources was a problem for researchers who work in mainland China. No doubt part of the reason was that many international websites were blocked. Moreover, the low internet speed increased the difficulty of accessing to full text papers. Researchers from teaching-intensive universities felt it was more difficult for them to access high quality content. In words of one social science researcher, 'My university doesn't have access to the premier journal of my study. As a consequence of this, the ease of availability of the source is more important than its quality.'

Researchers in the more anonymous environment of the questionnaire were more likely to say they were influenced in what they use or read by ease of access factor. Thus the level of agreement to both of the following statements were around 60% mark: a) If the information is not central to my research area, the ease of availability of a source is more important than its quality; b) When pressed for time, the ease of availability of a source overtakes considerations about its quality.

In interviews and focus groups, researchers enlarged our knowledge on this topic. Most of them were more likely to say that the ease of access was a factor for what they use. Some said they sometimes 'had to' cite the published version of record, but reading version (usually not the full text version) found on the open web, because they had no access to the proper source. Even researchers from the Institute of Scientific and Technical Information of China, the top institute of information and intelligence study of the country, said that the slow internet speed affected their research a lot and complained about the block of Google. One research said 'Sometimes you have to wait for 3-5 minutes to open the page that you want to check.' A few humanities in the focus groups aired concerns that it is a big risk to sacrifice quality for speedy discovery.

Another approach to investigating ease of access is asking researchers about the discovery platforms they use. Not only Google generation, but also experienced researchers started search academic information on internet search engines. Many mentioned that Google Scholar and the Google search engine provided ease of access and wide information horizons. This could explain why researchers were so upset with the block of Google and Google Scholar. Online library platform was the trusted information pipe, but sometime it was not a easy access, for instance, users may need a proxy server to visit library platform when they were not in the university. Surprisingly, open access journals and institutional repositories were never mentioned by researchers as an ease access.

4.5 Influence of social media

In questionnaire, only 20% of respondents agreed that social media is a reliable way to reach the target audiences. Most researchers had a low level of trust in social media and did not saw it as a reliable scholarly publication channel. In the focus groups and interviews, researchers said only when social media material was linked to traditional sources (e.g., a tweet about a peer reviewed journal article), they would trust it. In general, the data obtained from questionnaire and interview showed that younger researchers and social scientists were more likely to engage in social media than experienced researchers or researchers from other disciplines. Young and early career researchers thought that social media was an easy way to communicate with peers. For social scientists, social media provided them a platform and a tool to observe and analyze 'the society'. Thus, the use of social media was more likely to be considered.

Except for the trust and validity problems, there were many other reasons why researchers didn't use social media for scholarly discourse; b) no benefit to use it- it didn't help their career; c) they thought to discourse scientific work on social media would be arrogant and impropriate; d) the target audience were not social media user or did not use social media for scholarly purpose; e) social networking websites and applications were non-experts media that would waste their time; f) the lack of professional social media for scholars in a certain discipline, automotive engineering for instance; g) easy to be plagiarized.

Researchers who agreed that social media benefit academic works believed that social media a) developed their network both online and offline; b) facilitated collaboration among researchers; c)useful for keeping in touch with the research front in their area; d) provide an easy way to follow authors/institutes/ conferences you were interested in. Despite the aforementioned advantages, there was a reticence to contribute too much to social media, largely because young researchers didn't want to let themselves down/show their immaturity (CIBER 2013). As one chemical scientist said: ' it would be a great danger to post your work on social media.'

The interviews and focus groups showed that although almost all researchers were interested in using social media for personal interaction; both the young and the experienced use it to follow friends' updates and forward information, most researchers didn't use social media for scholarly discourse. Some researchers, mainly in social sciences, did recognize that social media could be valuable in a scholarly context for: a) obtaining new ideas, stimulation and starting new conversations; b) the self-promotion of their research and article,

books and conferences which presented that research, especially in regard to public outreach/public engagement of what they were doing as academics paid for out of the public purse(CIBER 2013.). While there were arguments on these, some researchers thought there was no need to consider the ideas offered by those outside their world, and the target audience might not follow the information or didn't use social media at all. Thus using social network for sparking ideas and promote research was an unrealistic dream.

Almost all the researchers agreed that social media is a tool for informal communication. Like face to face communication, social media provide a good platform for people to exchange ideas. However, it is not a reliable channel to exchange scientific information as other formal methods of communication, like journals and monographs. In group discussions, a researcher mentioned that whether the information on social media was trusted pretty much depended on who were doing the communicating. The research said that her supervisor, a well-known social scientist likes to post scholarly articles on his blog and had hundreds of regular readers in his study field.

Researchers interviewed and joint the focus group made a clear distinction between different social media forms. In general they thought professional internet forums and wikis were more reliable than other social media such as weblogs and microblogging. Wikipedia, Mendelay and ResearchGate were frequently mentioned as examples of reliable sources. Around 60% of researchers said they were becoming a more trustworthy source of information. ScienceNet.cn was another example mentioned, it is the most active and high-profile virtual community of Chinese-speaking scientists. Some experienced scientists write academic blogs and posting unpublished papers on ScienceNet.cn. Thus, it was considered to be reliable. Social networking websites that represent real-world professional relationships, such as Linkedin, were thought to be trustworthy media, because it links to formal information (e.g., peer-reviewed publication). But again, have a positive opinion on certain types of social media, doesn't mean researchers saw it as a proper outlet for disseminating scholarly works. Young researchers, who were perceived by their elders to be more knowledgeable about changes brought about by the digital revolution, especially the opportunities present by social media normally more conservative in social media use as they needed traditional, published outputs to get a job (CIBER 2013).

Researchers, both older and younger, frequently made the point that engaging much with social media would be a big waste of time. There was too much "noise" and information overload on social media. They don't have time to engage in activities where those outside their expert fields might present ill-informed views and get the way of proper scholarly interaction(CIBER, 2013).

Generally speaking, our study showed that social media provided a useful platform for researchers: a) to communicate ideas; b) develop personal relationships with peers; and c) outreach the public. In terms of use (not citing), most (60%) of researchers thought professional social media such as Wikipedia, Mendelay and ResearchGate has become a more trustworthy source of information. In respect to citing, the large majority of researchers (90%) felt that social media mentions were signs of popularity only and, as such, unlikely to be cited by them. In respect to dissemination, around(38.2%) of respondents used social media to disseminate research to their target audience. But younger researchers and social scientists were more likely to do it. Approximately 24% of all respondents blog about their findings in order to test the veracity of their ideas, with again social scientists were the most active. Over a half (55%) respondents disseminate their work to the target audiences through their personal websites. No policy influences were mentioned here.

4.6 Influence of open access publications

Open access provided an unrestricted online access to peer-reviewed scholarly research. When questioned about OA nearly all researchers welcomed open access as an idea good for developing countries to share knowledge. Such positive remarks were accompanied by negative views on the high profit of some big international publishers. However, the interviews and focus groups revealed there was a significant confusion about what the characteristics are which make something OA. For example, researchers were confused about the difference between open access and open data (source).

In terms of citing, some distrust of open access can be put down to misunderstanding. Most researchers thought open access-related source were free to access and not to be published by trusted publishers. The most common misunderstanding was the author-paid schema, researchers thought it was totally money-oriented, poor quality vanity publishing. This was partly because the author-paid for publishing model was very common in China. In some third-rated journals and publishers, content were not seriously peer-reviewed before publishing, and it was the author who covered the publishing fee. So in this publishing model, who paid will get published. Most of researchers in the focus group against this 'indecent publishing', but they all admitted there was a big market here. In addition, they have a common perception that OA journals do not have peer review systems or are not reviewed as strictly as subscription journals. In the focus groups, it was sometimes appropriate to correct these misunderstandings, and then researchers retracted their early statements about ubiquitously never trusting

open access and seemed to be willing to trust open access journal in certain circumstances, such as been properly peer reviewed and published by a prestige publisher(CIBER 2013).

Different from questionnaire findings, the qualitative study revealed that social scientists were particularly hard to convince about the quality of OA journals; they were very suspicious of the 'real motives' behind OA, and they concerns about the copyright issues. They suspected that the reviewers might be dependent and easy to be bribed due to the author paid model. Moreover, they doubted there is a real need for 'everything is free and available somewhere'. It was not convincing that the scholarly articles will be widely read even been open access published   'After all the target audience is such a small group.' they stated. Not surprisingly, life scientists were much more familiar with open access publishing and optimistic view on it. They do not only publish articles with 'pure' open access publisher, such as BMC, but also deeply involved in institutional repository and self-archive. Physics scientists and engineers were enthusiasm towards open access, but it seemed they mix open access with open date. For instance, they said other people could always reuse the open access source to research.

However, in the case of publishing, researchers felt more reluctant. First of all, they thought paying to have an article published is too much like 'buying' and that was something that made authors feel uneasy and insulted. A research from humanity study mentioned in the interview that authors should be paid for publishing high quality content rather than charged. In the meanwhile, researchers showed a surprising trust in established publishers and journals; they felt no problem if a famous or high impact factor journal charge them publishing fee. Many researchers said their institutes/universities would not only cover all publishing fee but also give appropriate financial incentives as long as they publish in high impact factor journals. Under this circumstance, they would like to see their article open accessed. Secondly, for some disciplines such as humanity and social science, it was relatively difficult for researchers to obtain funds; as a consequence, it was more difficult for them to pay for open access. And the third, the target audience was small that researchers felt no need to make paper open.

Early career researchers liked the principle of open access, and more willing to publish in this way, but they were scared to embrace it because they felt that academe has not made up its mind about it. Researchers from teaching-intensive universities were generally supportive of open access and happy to cite and publish in OA journals; although few had published in an OA journal. In further discussions, we enlarged our knowledge on the reason why they scarcely publishing in OA. Researchers from teaching-intensive universities published papers mostly in Chinese journals which had not embrace OA yet.

Researchers were asked whether depositing a version of their published work in an institutional repository, and if yes, whether it increased usage and/or citations and thereby helped to build their reputation among their peers. Researchers realized there was policy pressure on them to have their publication documented in institutional repository. Generally they believed it helps them to disseminate research result and build their reputation among their peers, but they don't accepts such kind of open access 'counting' as publications.

4.7 Influence of the availability of data

The role of data was asked in the questionnaire and further discussed in focus groups. Talking about data, researchers from different discipline had different understanding, for instance, social scientists saw data as interview recordings, questionnaire answers and photos, while in life scientists' eyes, and data means genomes, chemical compounds and formulae. A few humanities firstly deny the data produced in their works. But after the discussion, they said the data in their research may refer to non-textual material, for instance, a researcher who studied ancient books said the manuscript was the data in his eyes.

No matter how different the perception of what data is, researchers agreed that the access to data would increase trustworthiness in scholarly communication. Life scientists and engineers were more used to attach the data set to an article or put a link to the data set in an article. An engineer from remote sense study said in his field, the original data sent back from satellites were available for all researchers, thus with the open data set, researchers could always test the findings and conclusions of a published paper. While the situation was different in social science, researchers admitted that research data was more invisible for the audience. Normally a traditional scholarly publication (e.g., subscription journal) didn't publish data that related to the paper, so it was difficult to test if the data based conclusion was trustworthy or not. However, things were changed on the internet platforms; more and more journal published the research data together with articles in the forms of linking the paper to the data set.

However, there were worries regarding the persistence of links and whether they can be relied upon. Also there were concerns that even the data can be fabricated. Some researchers argued that the new techniques could be used for measuring and reviewing data, so it won't be a problem to increase confidence in testing hypotheses on data. Another concern was that the open data would lead to ethics issues, some data such as manuscripts and

interview recording would release personal information.

Most researchers who reference data agree with open data. On the one hand, they thought it would increase trustworthy; on the other hand, they admitted that they will not open the data unless the publisher/institutes required. In a word, the data-related trust depended a lot on the nature of the data and the nature of its use in the discipline. There were many different databanks and databases with different positions in different discipline.

4.8 Influence of preprints and rapid publication

In some disciplines, the reprints publications were common. For instance, in computer science, some top-tier conferences publish peer reviewed preprints and letters. In the focus groups and interviews, a few physics and computer scientists said that it was necessary to publish and cite preprints for fast and simplicity. However, they believed the reliability of preprints was mostly depended on its publishers/authors/ conferences and there was a big risk to cite preprints because it probably be changed when formally published. Occasionally preprints did not become journal articles and their status was determined by comments.

Rapid publication is not usually differentiated from "normal" publication and usually operates only in biomedicine. It sometimes a special online facilities for "publish early view" which many biomedical publishers offer. Because no biomedicine scientists presented in the focus groups and was interviewed, their opinion on this topic missed in this research. For the researchers attended focus group, rapid publication can be refer to a sort of online published paper, or an online version of traditional journals. The journal's having a print version in fact makes no difference to speed to online availability and its being open access does not matter either (CIBER, 2013).

It is noteworthy that there was another understanding of what rapid publication is. One of researchers mentioned in focus group that rapid publication can be refer to a monograph or a scholarly book which be printed out before formally published. In China, there is a big need for such "early publications", because the traditional book publishing process is time consuming and sometimes researchers need their books get published before the "dead line" of applying for promoting: they have to show the academic board all their publications. Usually, such kind of early publication is very much alike formal publication in both content and appearance. The difference is that the early publication has a very small "print run"; less than ten copies. This is because the researchers only need a few copies to present, and the fast printing is very costly.

The questionnaire asked about pre-prints in regard to citation behavior only. The main finding was that citing a pre-print not accepted by a journal was not a practice prevalent in their field, but was thought to be more acceptable by younger researches and researchers who published fewer articles.

4.9 Unethical practices

Plagiarism was a ever lasting topic in the news and was thought to be widespread in academics, especially among researchers because the publishing pressure was relatively bigger for them. While in the focus groups, all young researchers were antagonistic toward plagiarism although most of them understood the reason for doing it. They mentioned that because of the high visibility of digital publishing and the widely using of antiplagiarism software, the cut-and-past thing was getting less. Nowadays, the plagiarists changed the expression in their own words so the text analyzing technology based antiplagiarism software couldn't the cheater find out. So it was the reader who does the whistle-blowing these days. Self-plagiarism, they seemed to think, was a less unethical practices; maybe not offence at all

Fabricating research was discussed in the focus groups also. Researchers worried that fabricating research was probably more widespread than generally thought. They believed that even highly respected academics undertaken this for driving their article productivity up. In order to against fabricating research, the Chinese Ministry of Education spot checks doctoral dissertation every year, if been spotted as fabricating research, the doctoral degree will be recalled.

In terms of publishing, multiple authorship (it's very common that professor's name appears in front of the students name, even the professor did not write a line of the article), multiple submission (submitting one and the same article to more than one journal) and bribing the journal editor were also discussed by researchers, they thought that these practices might not as unethical as plagiarism and fabricating, but they were more widespread than generally thought thus muddy the water a lot.

Ethical considerations were particularly evident regarding citation behaviours. Researchers in the questionnaire survey rated the following activities poorly: (1) citing a pre-print that has not yet been accepted by a journal; (2) citing sources disseminated with comments posted on a dedicate website (open peer review); (3) citing only sources published in developed countries; (4) citing the published version of a record but reading another version found on the open web; (5) citing one's own work to improve one's citation ranking; (6)

citing papers in the journal to which an article is submitted for publication to improve its chances of acceptance; or (7) citing papers mentioned by reviewers to increase changes of acceptance.

4.10 Adoption of new measures of research impact (altmetrics and usage factors)

With the development of internet scholarly communication, new measures of research impact were adopted. The article based metrics cover not just citation counts, but also other aspects of the impact of a work, such as how many data and knowledge bases refer to it, downloads or mentions in social media. Most participants in focus groups and interviews produced little in the way of information on new research impact metrics: they were not really aware or interested in "altmetrics" or usage metrics too. They were not talking on the basis of any real knowledge or experience. For those who had something to say said new measures of research impact were not going to help them in their research appraisals and exercise. They also thought: 1) the usage counts were too easily gamed; 2) downloads did not represent readings, because many were not read once they were downloaded; 3) highly mentioned or used articles were not said to be good research result, on the contrary, they could be the worst ones.

The questionnaire data showed the same thing, that there was a general agreement that usage and social media derived metrics were indicators of popularity and not quality or credibility, and, as such , of no help to researchers(CIBER , 2013). Older researches were clearly more likely to believe this. There was also a significant difference in response according to the number of publication that the author published; productive researcher who published more papers felt more strongly that the usages and social mentions were mostly indicators of popularity.

5. Diversity

In general, the both the qualitative work and questionnaire data showed a remarkable consistency across the board in respect to the importance of the traditional pillars of trust (content quality, peer review, journals). It also exposed inconformity about social media, open access and trust proxies among different age groups, disciplines and research productivity.

5.1 Age

Young or early career researchers (defined, for this study, as those 30 and under) were a research community of particular interest because, although not quite the Google Generation, they will have spent their careers and higher educational years in a largely digital environment (CIBER, 2013). The questionnaire showed the young researchers as a new generation is different from their more established colleagues. The questionnaire showed that some of the differences are very significant.

Taking **usage and reading behavior** first, young researchers (under 35 in this research), rated the following actions as more important compared to their older colleagues (not as important as other actions but significant different from experiences opinions):
- Checking whether author's country of affiliation is known for its research
- Taking into consideration colleagues' opinions of it

This shows that the younger researchers relied much more on the external criteria such as advice of colleagues and checking whether author's country of affiliation is known for its research. It could be that the younger researches lacked the confidence in their own judgment, which was so much a feature of the behavior of mature researchers.

They rated on average the following actions as more important when determining what to use/read :
- Checking the methods
- Checking to see if the data used in the research are credible
- Checking if the arguments and logic presented in the content are sound

And these activities *much* more important:
- Reading the abstract

In contrast those researchers over 35 thought the following more important:
- Reading the information source (article, book chapter, etc.) in its entirety
- Checking the methods
- Checking if the arguments and logic presented in the content are sound

And this to be *much* more important:
- Reading the abstract

It seems clear that older researcher were connoisseurs and more able to make their own judgments. Also, we can see that checking the abstract was highly

rated by both groups.

Besides, both younger and older researchers believe more strongly that:
- Peer reviewed journals are the most trustworthy information source.
- The journal's Impact Factor is important for deciding what to read.

Younger researchers also agree more than their experienced peers:
- Wikipedia has become more trustworthy over the years.

In regard to choosing an **outlet for publication or dissemination**, young researchers considering the following more important:
- It is indexed by reputable/prestigious abstracting/indexing databases, such as ISI or Scopus
- It is highly cited

And these much more important:
- It is highly relevant to my field

In comparison those over 35 considered the following to be more important:
- It is published by a traditional scholarly publisher
- It has both an online and a print version

And these much more important:
- It is indexed by reputable/prestigious abstracting/indexing databases, such as ISI or Scopus
- It is highly relevant to my field

Although both groups seemed not so interested in open access, young researchers viewed open access more positively as it offered more choice. Older researchers were clearly more conservative; for those traditional scholarly publishers were much more reliable and online publications were seeing as a subsidiary nice to have.

Both young and older researchers agreed more strongly than their older colleagues with the statements:
- People who don't have tenure have to publish in good journals to build up a reputation.
- To obtain research grants I have to publish in highly ranked journals.
- I publish in journals because a paper placed in a journal obtains a context, becomes part of a 'conversation'.

And they are much more strongly with these statements:
- As peer reviewed journals are the most prestigious place in which to publish, they are likely to contain high-quality material.

There was [significant](#) [difference](#) between two groups in the attitudes towards to the statements:
- 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.
- I tend to blog about the findings of my research, which is a good way to test the veracity of my ideas.

Young researchers clearly used all the outlets available to them in order to get their work published and in this respect made most use of the new digital services with which they were more familiar.

Incidence

In respect to **citing behavior,** although the incidence was low, young researchers saw the following as more often:
- Citing papers in the journal to which an article is submitted for publication to increase chances of acceptance
- 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)

In comparison with older researches, young researchers saw these were more important:
- Citing the most highly cited information sources
- Citing the seminal information source published on a topic

Young researchers seemed more willing to use any devices to improve their chances of acceptance and were much more liberal in their citation behavior generally.

Regarding **changes to the scholarly environment** young researchers believed more strongly that:
- 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 mediocre/poor quality material.

A significant difference between two groups here is that the young researchers are much more strongly that:

- There is a less strict/ less rigorous peer review process and as a result, there is a flood of poor quality material.

Young researchers were highly appreciative of changes that have resulted in an improvement in the improvement in the availability of quality filters, and they were pessimistic about standards, quality and decency. The qualitative data provided some explanation for these, young researchers saw them as 'slaves 'to a metric based/journal focused system, which they have to adhere to the rules to climb the academic ladder. On the one hand, they thought the ladder was broken and the system did not work well on filter low quality publications. On the other hand, they felt that the new system was not established yet, and it would be risky/ too early to accept new outlet. The qualitative work also confirmed that young researchers were more tolerant to unethical citing behaviours. It could be that young researcher felt much more pressure on publishing and they 'have to' use all means to increase the acceptance.

5.2 Discipline

The questionnaire shows that, generally speaking, there were more discipline similarities than differences when it comes to trust judgments. The differences are listed below.

Life scientists:

- Believed more strongly than those in other disciplines that determining trustworthiness as to what they read/use was best accomplished by: (1) Checking to see if the data used in the research are credible;(2) Checking whether author's country of affiliation is known for its research
- Believed more strongly that: (1)peer-reviewed journals are the most trustworthy information source; (2) the journal's impact factor is important for deciding what to read.
- Believed more strongly that when deciding where to publish their work the publication should be: (1) open access; (2) placed in a journal obtains a context, becomes part of a 'conversation'.
- Believed more strongly that it is important to cite: (1) Citing the most highly cited information sources; (2) Citing the most recent source published on a topic; (3)Citing papers in the journal to which an article is submitted for publication to increase chances of

acceptance; (4)Citing papers mentioned by reviewers to increase chances of acceptance.

- Were more likely to say: (1) 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) The journal Impact Factor is important for deciding what to cite.

Physical scientists:

- Believed more strongly than those in other disciplines that determining trustworthiness as to what they read/use was best accomplished by checking the figures and tables
- Believed more strongly that: (1) If the information is not central to my research area, the ease of availability of a source is more important than its quality; (2)Wikipedia has become more trustworthy over the years; (3) 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
- Were more likely to publish on international journals;
- Believed more strongly that: (1) Citing the seminal information source published on a topic; (2) Citing the first information source published on a topic; (3) There are more outlets, it is easier to get published and as a result, there is a flood of poor quality material.

Humanities believed more strongly than those in other disciplines that determining trustworthiness as to what they read/use was best accomplished by checking to see if it is peer reviewed.

The focus groups and interviews showed that there were more disciplinary similarities than difference. It is possible that over the last decade there has been a convergence across the sciences and social sciences as far as research practices and behaviour relating to information is concerned: certainly the structure of the academic article has gradually become standardized across the majority of field (CIBER 2013). The qualitative work also showed the disciplinary difference was significant when it came to open access journals and social media: life scientists, not surprisingly, were more supportive to open access journals while social scientists were most frequent users of social media (or at least more willing admitted to it.). Neither of these findings were borne out by the questionnaire data. Maybe this is because researchers had different understanding (or misunderstandings) of these two topics, and the focus groups and interviews provided them opportunities to discuss them deeper.

6 Changes over time

On the whole interviewee and focus group participants said that there had not been many changes in the way they went about determining trustworthiness. Having said that, peer review and the journal was still the pillar of the system. Even in humanities, where monographs were used to be more important for finished top tier researches and appropriate for the longer" messages", journals appear to have a greater importance than they ever had. For the vast majority of researchers, publishing in top journals was still the main way to obtain a reputation, get a job, and obtain promotion.

Researchers saw a tendency that publishing in international and reputable/prestigious abstracting/indexing databases indexed journals is getting more and more important. Researchers, especially the young felt a lot of pressure from the policy and they thought the pressure will get bigger in future. A few mentioned where to publish is much more important than what to publish.

Many researchers acknowledged the fact that there is more 'poor' stuff around, because it is more accessible and there were more opportunities to publish. Surprisingly, young researchers thought the less strict/ less rigorous peer review process play a role in leading to a flood of poor quality material. This maybe because young researchers are more involved in internet based scholarly communication such as social media, in where the peer review system doesn't work very well. Generally speaking, the questionnaire findings showed that researchers felt more downsides of rapid expansion in scholarly publishing and communication than the upside. On the contrary, in the qualitative work, especially in the focus groups, researchers were more likely to say the quality of research work has been increasing over the past few years. We are not sure the reason why the different understanding happened. It maybe that in face to face conversation, participants were more reluctant to reveal their real thought or they were infected by opinion leader (say older researchers in the same discussion).

In focus groups, researchers were split, some said the overall quality of research has risen, while some mentioned that they had become much less trusting over the last few years. They also felt that papers were published to fit metrics which was not necessarily the best way to present research.

Researchers mentioned other changes:
- Most researchers interviewed had a clear acknowledgement that the technology has changed their behavior. "Easier" and "convenience" were the most common word they used to describe the change. Use and

dissemination has become easier with the emphasis very much on the former. The Internet provides a whole range of new ways of finding information and communicating ideas. The internet provided easy ways of quality judgment, such as cross-checking and fact finding.

- Technology was now in place to collect measure and analyse research impact and individual performance.
- In terms of dissemination, it was universally agreed that there was much greater pressure to publish than ever before, and to publish more quickly.
- Social media was increasingly useful for ideas, references and outreach. Social media were used to communicate with practitioners, government and public, which made the whole process easier and faster.
- Researcher were acting more unethically or more tolerant of such unethically practice.
- Information overload.

7 Conclusions

In an increasingly digital environment, many factors influence how academic researchers decide what to read, what to cite, where to publish their work, and how they assign trust when making these decisions. It seemed a likely conclusion that researchers' current perceptions of the quality and reliability of information sources and channels and their present-day practices of determining trustworthiness might have changed in the light of what can only be described as a digital revolution. Alongside their proven and trusted information sources, channels and metrics, today's researchers also have at their disposal a host of novel, web-based ways and means, which could be used for establishing scholarly trustworthiness (CIBER, 2013).

The biggest finding of this research is that peer reviewed journals retain and even have increased their importance as the preferred and trusted vehicle for formal research communication. And the traditional scientific evaluations system is still very influential on researchers when making decisions on what to read, what to cite, where to publish their work. The transformation of scholarly communication and new metrics are still something for the future. Open access was generally accepted or even understand correctly and comprehensively in China.

Besides, another important finding is that Chinese scholars compared to those from developed
countries such as USA and UK, rely more on authority, brand and reputation as proxies for trustworthiness and credibility of research. They felt more stressful to publish in reputable journals that are indexed by well-known

databases and international journals, even humanities saw this change ongoing.

7.1 Use and reading

Personal inspection of actual content and recommendations from colleagues and friends were the main methods for establishing trustworthiness. Abstract are always important in making decisions in digital environment where choices and uncertainty are that much greater. Peer reviewed journals were the most trusted source by a huge margin. Impact factor are important in determining what to use/read by and large, except for humanities. Social media was regarded as tools for communicating ideas rather than reliable scholarly information. Google and Google scholar are central to start finding information, but regrettably they have been blocked. Library platforms were used for discovery by researchers from research universities.

7.2 Citing

Journals were more heavily cited than other publications. Journals known to have rigorous peer review processes were especially seen as objects of trust. The journal name could add credibility to the author. In making choices, People often started with abstract, then the methodology, then the major figures, and then they would read the entire article. Abstracts were very important tools to determine the article's reliability. In the sciences social media were never cited. Open access articles typically came into the category of newer and therefore less established journal articles.

7.3 Publishing

There was overwhelming agreement that external pressure had grown in recent years and implicitly that this pressure interfered with the free exercise of their deployment of trust criteria. there was a tacit hierarchy of journals in a discipline which governed a lot of decisions depending on what level of journal was deemed appropriate (by an experienced researcher) for the level of likely interest in the paper. There was a tacit hierarchy of journals in disciplines which govern a lot of decisions depending on what level of journal was deemed as appropriate (by an experienced researcher) for the level of the paper.

7.4 Social media

Almost all researchers made a clear distinction between formal and informal methods of communication with social media in the latter grouping and journals very much in the former. Most researchers recognized the utility of social media as a way to reach a wider audience. Social scientists used social media more in outreaching and observing the 'real' life, but they would not cite social media.

7.5 Open access

In principle open access was welcomed because it enabled greater access, but one of the problems presented by open access journals was that a lot of researchers did not recognize what makes a journal open access. Very few considered that paying to publish would not inevitably lead to a distortion of the peer review process: your article could be published just because you were paying --there was a presumption of a lower quality.

7.6 Data

Although access to full content was much more important than access to data when trust was involved, increased access to data was seen as one of those aspects of change that was positive. Hypothesises based on theories or past research can now be tested because there are new techniques for collecting, measuring and viewing data. There were also concerns that open data might cause copyright issues and the maintenance of databank would be another expensive issue to be solved.

7.7 Altmetrics

There were no signs at all that alternative metrics were making any headway with the research community in China. Most researchers knew little about them. Social media mentions were thought to be as usage metrics instead of indicators for quality and credibility.

7.8 Diversity

Young researchers concurred with the perception of their strengths and weaknesses as digital natives or at least those who had always lived within a digital environment as researchers. They did not yearn for a more open environment, because they recognised that they had to publish in journals known for their quality if they wanted to get recognition and tenure. They saw

themselves more as apprentices than parts of the transforming scholarship. There were some disciplines, specifically computer science and mathematical physics, where some trust behaviours were different. However, in general there was a remarkable similarity in attitudes and behaviours across both the sciences and the social sciences.

7.9 Changes

Researchers have moved from a print-based system to a digital one, but it has not significantly changed the way they decide what to trust. The digital transition has not led to a digital transformation. Traditional peer review and print journals still hold sway. Measures of establishing trust and authority do not seem to have changed profoundly in China. The Internet technology brought ease and convenience to scholarly communication while gave more pressure to publish on high quality platforms.

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