Do Younger Researchers Assess Trustworthiness Differently when Deciding what to Read and Cite and where to Publish?

David Nicholas*, Hamid R. Jamali**, Anthony Watkinson**, Eti Herman**
Carol Tenopir***, Rachel Volentine***, Suzie Allard***, Kenneth Levine***

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ABSTRACT

An international survey of over 3600 academic researchers examined how trustworthiness is determined when making decisions on scholarly reading, citing, and publishing in the digital age and whether social media and open access publications are having an impact on judgements. In general, the study found that traditional scholarly methods and criteria remain important across the board. However, there are significant differences between younger (age 30 & under) and older researchers (over 30). Thus younger researchers: a) expend less effort to obtain information and more likely to compromise on quality in their selections; b) view open access publishing much more positively as it offers them more choices and helps to establish their reputation more quickly; c) compensate for their lack of experience by relying more heavily on trust markers and proxies, such as impact factors; d) use all the outlets available in order to improve the chances of getting their work published and, in this respect, make the most use of the social media with which they are more familiar.

1. Introduction

The research reported in this paper comes from an international study, 'Trust and authority in scholarly communications in the light of the digital transition', which was funded by the Alfred. P. Sloan Foundation. Essentially, the main thrust of the project was to establish whether perceptions of trustworthiness and methods for establishing trustworthiness had changed among academic researchers as a result of the digital transition and what it had ushered in, such as open access publications and social media. Had the digital transition, for instance, made it more difficult to establish trustworthiness and, maybe, have new scholarly activities supplanted traditional ones? Clearly there are good reasons and some evidence for thinking this could be the case:

- Today's expanded, dynamic, diverse and dis-intermediated digital scholarly environment, with its greatly changed, market-driven scientific culture, means that it is ever more difficult to establish trustworthiness (Bauerlein et al., 2014; Casadevall & Fang, 2014); Colquhoun, 2014; Voas et al., 2011).
- There are many more sources, channels, platforms, voices and players in the virtual world, all potentially muddying the scholarly waters that it is increasingly difficult to know whose information it is (Agichtein et al., 2008; Rowlands et al., 2008).
- The new generations of scholars are bringing with them new and challenging information seeking and reading behaviours (Rowlands et al., 2008). In particular it has been found that for them ease of access is an important factor in determining choice (Tenopir et al., 2011; Catalano, 2013).

Trustworthiness, authority and quality matters everywhere, but they are the very watchwords of scholarly communication, a system designed to deliver quality assurance. So any evidence that virtual scholars, especially younger ones, might be adopting different habits in what they read and cite and where they publish/disseminate is clearly of interest and that is primarily what we wish to demonstrate in this paper.

One of the Sloan project's principal research question was are there differences in scholarly behaviour in respect to the age, nationality, institution, gender and discipline of the researcher? This paper focuses on the age differences part of this question by examining whether younger researchers (defined as those 30 and under in 2013) are any different in the way they assign trust when it comes to using, citing and publishing scholarly content. This study then focuses on the behaviour of researchers who were born in 1983 and later. In other words, they are largely Generation Y or the Millennial generation (born 1982-1994), but also include a small element of the Generation Z/Google Generation (born 1995-2012).

This age group are a scholarly community of particular interest because they are after all the new wave and may have been conditioned by having spent much of their time living in a digital environment. Because of this, it is alleged, that they are "detached from institutions and networked with friends" and have distinctly different behaviours, values and attitudes from previous generations as a response to the technological and economic implications of the Internet (PEW, 2014). For the purpose of this paper we shall refer to them throughout as 'younger' researchers.

As mentioned earlier, this study uses original data obtained from the Alfred P. Sloan Foundation funded study 'Trust and authority in scholarly communications in the light of the digital transition' (Nicholas et al., 2013). However, this study presented here constitutes a completely new analysis on the original source data. Neither the data, nor analysis of the data, are available in the original report. The original data has been updated with reference to more recently published research, which can be found in the literature review.

2. Literature review

2.1. Trustworthiness

There have been studies on the information seeking behavior of millennials and a review of them (Connaway et al., 2008) shows some of their traits, most notably being that they have no tolerance for delay, they display high level of self-efficacy, they learn well in visual environments and they are result oriented. However, and puzzlingly perhaps, given the widespread interest in the generation born in the digital age, few scholarly communication studies major or focus on age or generation differences in information behaviour. The few studies that have investigated age are generally disappointing in that they do not present deep or comprehensive analyses. For example, the Elsevier Author Feedback studies showed that over a ten year period there was a move to a greater involvement of younger researchers in the surveys, but the main concerns of authors (referring, impact factors etc.) are not broken down by age (Mabe & Mulligan, 2011). The Ithaka S+R Faculty Surveys (on their fifth cycle) concentrated on disciplinary differences and did not discuss response patterns broken down by age. They do, however, frequently ask about differences between older and younger faculty, particularly in relation to their use of technology. Although the responses, again surprisingly, have never been systematically analysed to investigate the impact of age/professorial rank, historically there seems to be relatively little difference between older and younger (or senior and less senior) faculty members on most questions relating to use of technology (Housewright, 2013).

There is scattered evidence of age differences or similarities in a few studies. Thus, a Research Information Network (2014) study into how and why UK researchers publish and disseminate their findings reported that citation behavior and motivations are related as much to researchers' age or length of experience as to the disciplines in which they work. Also reported was that younger researchers are more likely than their more experienced colleagues to be influenced in choosing what to cite by their knowledge of the author, and by the standing of the journal and ease of access to the article. Larivière et al. (2013) covering similar ground found that doctoral students tend to cite more documents per article than faculty members, and that the literature they cite is, on average, more recent.

Tenopir et al. (2013) sought to understand the trade-offs that scholars make when they decide which articles to read. Interestingly they found no significant differences in the way respondents 30 and under and those over 30 ranked any of the characteristics. However, in contrast, previous studies did find some significant differences between reading behaviours in faculty members aged 30 and younger as compared to those above 30. Younger faculty members are more likely to read a higher percentage of articles from e-journals, they are also slightly more likely to read on-screen, and have fewer personal subscriptions to journals, which is perhaps what one might have thought (Tenopir et al., 2009).

A BL/JISC study, devoted specifically to the researchers of tomorrow – Generation Y doctoral students – focused on their information-seeking and research behaviour. It found that doctoral students are sophisticated information-seekers and users of complex information sources. They are acutely aware of authority and authenticity in research and evidence gathering and much concerned about quality control and reliability. Undergraduates appear to be quite another case because Georgas

(2014) found that while they believed themselves to be skilled researchers their search queries and behaviours did not support this beliefs.

In a study of how young people deal with information overload Benselin & Ragsdell (2015) discovered that people of all ages suffer from information overload, but that young people's difficulties arose because of an inability to evaluate and discriminate whereas the difficulty for older people came from the plethora of platforms.

2.2. Social media

It might be expected that age would be investigated in studies of the use of the social media in scholarly communications. After all it is commonly held that the young are preoccupied with the social media. However, this turns out not always to be the case. Thus Ponte & Simon (2011) failed to investigate age differences in their study of social media use. However, CIBER's investigation found that age is an interesting demographic when it comes to the use of social media in research. Broadly speaking, there is a break point around 35 years. Researchers younger than this are significantly more likely (82.6%) to use social media professionally than the older colleagues (75.7%). This effect was statistically significant, but is not large. This is a very crude simplification, however, since it brings together researchers who happen to use any of eight categories of social media tools. A more detailed picture is revealed when the individual tools are examined. Microblogging, social tagging and bookmarking are relatively more favored by younger researchers, and conferencing, image and video sharing by the over 35s. However, the age distribution of research users of each of the eight social media tools reveals that it is very difficult to detect any general overall pattern and a crystal clear distinction (Nicholas & Rowlands, 2011).

Other studies, such as Proctor et al. (2010) also confirmed that the age distinction in the use of social media in scholarly communications is not very clear. A RIN study found that, although junior and younger researchers are more likely to be frequent users of social networking, high usage of the kinds of web 2.0 tools associated with producing, sharing and commenting on scholarly content is positively associated with older age groups and those in more senior positions. The most frequent use occurred among the 35-44 age group and the lowest among those under 25; and the highest among research assistants and the lowest among PhD students (Research Information Network, 2014). Tenopir et al. (2013) also found little in the way of a relationship between age and the creation or use of social media other than in the case of blogs, RSS feeds, and Twitter. In the case of the latter, high-frequency users or creators are more likely to be aged 50 or younger. These findings are borne out by the results reported by Shema et al. (2012) according to which the average research blogger (that is a blogger who writes about academic, peer-reviewed research) in their sample is either a graduate student or has been awarded a Ph.D. Still, as Carpenter et al. (2012) show, although levels of use of social media are steadily rising among Generation Y doctoral students, passive use, such as following blogs, is much more common than active use − blogging oneself.

Overall, this review of the literature shows that there are few comparative studies published in regard to age and information seeking behaviour in the digital world and there is little on the trust-worthiness aspects of this behaviour. Furthermore, in the clearly related and interesting area of the

social media and scholarly communication the evidence is scattered and contradictory. This study hopefully contributes to our knowledge in what is a surely strategic topic for information professionals everywhere.

3. Methodology

The data from this paper comes mainly from an international questionnaire study, which formed the major data collection instrument for the Sloan project, general information about which can be found on the CIBER website (2014). Focus groups and one-to-one interviews were used to scope the questionnaire and help frame its questions and more on these research instruments can be found in Nicholas et al. (2014), Jamali et al. (2014), and Thornley et al. (2015). Indeed, the questionnaire used is a little unusual in featuring statements made by focus group participants and interviewees which are then used in the questionnaire in order to determine levels of consensus with these statements. This was thought necessary given the vague and tangled nature of the terminology associated with the topic which academics were being questioned about – trust, trustworthiness, authority, quality etc. Data from the exploratory focus groups and interviews are also used in this paper to provide context and explanation for the survey data.

Six scholarly publishers agreed to send an e-mail invitation to authors who have contributed to their journals. The publishers reached a wide range of academics worldwide. The survey, which was hosted on SurveyMonkey.com was made available for a month in the summer of 2013. Participants were asked a total of 24 about scholarly information practices and perceptions. The core analysis of the questionnaire data relied on Likert scales ranking the importance or agreement with characteristics and statements related to the trustworthiness of a source/channel in respect to three key scholarly activities - using/reading, citation, and publishing. In total, 3650 researchers responded to the questionnaire, making it one of the biggest surveys of its kind, if not the biggest.

The survey was sent to researchers who had published at least one article in a traditional scholarly journal at some point in their careers and were on one of the publishers' mailing list. Therefore, the results do not represent scholars that have completely eschewed traditional publishing routes, but that would be very difficult to do in today's universities. Because we cannot be sure how many surveys were distributed to unique potential respondents, it is not possible to calculate a response rate. Approximately 20% of respondents declined to answer some/all of the demographic questions. Therefore t-tests to check for significant differences in response could only be undertaken for 80% of all respondents. All five-point Likert scales used 5 to indicate the highest level of agreement or importance. The mean value was then calculated and the higher the mean value the more importantly or more strongly the respondents rated those characteristics and statements. Independent samples t-tests (2-tailed) were conducted to establish statistical differences between <=30 and >30 age groups. All t-test tables include mean ratings (M) and standard deviations (SD). Cohen(1988)'s d effect size values (d) have been calculated for all items which are presented in the last column of all t-test tables. Based on Cohen(1988)'s interpretation of the magnitude of effect sizes, values <0.1 mean no effect, values between 0.2 and 0.4 mean small effect, values between 0.5 and 0.7 mean intermediate effect and values equal to 0.8 or greater mean large effect.

This paper focuses mainly on the 368 respondents who were 30 or under at the time of survey. They represented 10.1 % of all respondents. However, for all of the analyses furnished younger researchers are compared to the 2,645 older researchers and that adds weight to the analyses.

The age breakdown of the respondents that fell into the 30 and below category is provided in Table 1 and it can be seen that all but a small minority belonged to Generation Y. More than three quarters were 26 years of age or older. This younger researcher group was quite mixed consisting of faculty members, researchers, and (largely doctoral) students (Table 2). Tables 3 and 4 show the geographical and subject breakdown of younger researchers and also show how this compares to the breakdowns for the older group and it can be seen that Asia and the Middle East are better represented among the young researchers, as too are the physical sciences.

Table 1. Age breakdown for young researchers

age	N	%
-18	2	0.5
19-20	6	1.6
21-22	27	7.3
23-25	57	15.5
26-27	95	25.8
28-30	181	49.2
Total	368	100

Table 2. Occupational breakdown for young researchers

Occupation	N	%
Full-time researcher	117	31.8
Part-time researcher	45	12.2
Full-time faculty member	38	10.3
Part-time faculty member	12	3.3
Student	138	37.5
None of these	17	4.6
Total	367	100

Table 3. Continent breakdown of young and older researchers

Age		Africa	Asia	Australia& Oceania	Europe	Middle East	North America	South & Central America	total
<=30	n	19	126	10	88	49	49	17	358
	% within Continent	16.0%	25.6	6.5	9.9	25.5	5.1	11.0	12.1
>30	n	100	367	145	797	143	919	138	2609
	% within Continent	84.0	74.4	93.5	90.1	74.5	94.9	89.0	87.9
All	n	119	493	155	885	192	968	155	2967
	% within Continent	100	100	100	100	100	100	100	100

Table 4. Subject breakdown of young and older researchers

Age		Life Sciences	Physical Sciences	Social Sciences	Arts & Humanities	Total
<=30	n	85	107	147	20	359
	% within subjects	11.1	14.7	12.0	8.8	12.2
>30	n	678	621	1078	208	2585
	% within subjects	88.9	85.3	88.0	91.2	87.8
All	n	763	728	1225	228	2944
	% within subjects	100	100	100	100	100

As mentioned earlier, focus groups and one-to-one interviews preceded the survey and their purpose was to scope and suggest questions for the survey. They were conducted with US and UK researchers and 153 researchers were involved. Of these 13 were 30 or under and some of their views are represented in this paper in order to help clarify the questionnaire data. More information about this part of the study can be found in Nicholas et al. (2014).

4. Results and discussion

The analysis covers the 7 questions contained in the survey which were about how trustworthiness is determined when making decisions on scholarly reading, citing, and publishing. Each question listed various statements about these scholarly activities that required an agreement, or importance rating from the respondent. The principal focus of this paper lies in the responses that showed statistically significant differences between younger (younger being defined as aged thirty or under) and older researchers.

4.1. Usage and reading behaviour

This is the scholarly activity that is least prescribed for researchers as, in theory anyway, researchers can use/read what they want. So it is here that we are likely to see more innovation, experimentation and changes in behaviour. Two questions were asked with respect to usage/reading: 1) what activities are associated with determining what to use or read; 2) what are the perceived trustworthiness attributes of various scholarly sources.

4.1.1. Activities associated with determining what to use or read

Sixteen activities were identified with respect to determining what to use/read which shows what a complex activity it really is. Researchers were asked to rate their importance on a scale of Extremely Important (1), Very Important (2), Important (3), Somewhat Important (4), or Not Important (5). Table 5 shows the 10 activities for which there were statistically significant differences in the responses of younger and older researchers. The mean ratings are given for the two groups in columns 2

and 5. For younger researchers reading the abstract was the most important activity in determining what to use/read (4.21). The second and third most important activities were, respectively, checking to see if the data used in the research are credible and checking whether the arguments and logic presented in the content are sound. These three activities were also the ones considered to be most important for older researchers. However, younger researchers rated on average four activities to be more important than older researcher did. They included checking author's country of affiliation, checking the number of downloads, checking where the source was obtained and taking account of colleagues' opinions.

Although younger researchers rated three other statements (reading the abstract, checking the name of the publisher and checking whether the source is indexed by an authoritative body) more importantly, the effect of size values for these statements were too small to count these differences as significant. In contrast, older researchers thought the credibility of the data, soundness of logic and arguments and being peer reviewed to be more important.

Overall, this is the result we might have expected as it shows that younger researchers, having to learn the scholarly ropes to ascend the career ladder, rely more on trust markers, document proxies and the advice of colleagues in their decision making. It would seem that older researchers act more like 'connoisseurs' and are more able to make their own judgments, although peer review is clearly an important prop for them.

Table 5. Q.1 How important do you consider each of these activities when deciding what information to use/read in your own research area?
(Mean rating, 1= not important to 5= extremely important)

Item	<=30			>30			All	d
	M	n	SD	M	n	SD	M	
Reading the abstract	4.21	366	1.01	4.07	2625	1.08	4.08	0.13**
Checking to see whether the data used in the research are credible	4.18	365	0.090	4.29	2627	0.83	4.27	0.19***
Checking whether the arguments and logic presented in the content are sound	4.14	366	0.85	4.37	2630	0.73	4.34	0.29*
Checking to see if it is peer reviewed	3.50	361	1.14	3.87	2623	1.07	3.83	0.33*
Checking whether the source is indexed by an authoritative indexing body (e.g. ISI, PubMed)	3.10	365	1.27	2.93	2615	1.32	2.95	0.13***
Taking into consideration colleagues' opinions of it	2.97	363	1.05	2.60	2613	0.98	2.65	0.36*
Taking account of where source was obtained from (e.g. publisher's website, university library catalogue, search engine)	2.71	362	1.28	2.36	2614	1.26	2.40	0.28*
Checking the name of the publisher	2.70	364	1.23	2.51	2624	1.21	2.53	0.16**
Checking to see how many times it has been downloaded/ accessed	2.55	365	1.61	2.10	2623	1.06	2.15	0.33*
Checking whether author's country of affiliation is known for its research	2.38	366	1.13	2.08	2628	1.06	2.12	0.27*

* Significant at p <0.001, ** significant at p <0.01, *** significant at p <0.05

4.1.2. Levels of agreement with statements on the quality and trustworthiness of information sources

Respondents were provided with a list of 8 statements concerning the trustworthiness, or otherwise, of a range of information sources and asked to rate them. Table 6 lists the 4 statements for which there were statistically significant differences in the responses of older and younger researchers. The scale was: Strongly agree (1), Agree (2), Neither agree nor disagree (3), Disagree (4), Strongly disagree (5). The mean rating of the statements are given for the two age groups in columns 2 and 5. Of the statements younger researchers agreed most with the statement Peer reviewed journals are the most trustworthy information source (3.85). Younger researchers agreed more strongly than their older colleagues that: The journal's impact factor was important in deciding what to read (3.37); If the information was not central to their research area, the ease of availability of a source was more important to them than its quality (2.95); and when pressed for time, the ease of availability of a source over-took considerations about its quality (3.25). In contrast, older researchers agreed more strongly that peer reviewed journals were the most trustworthy information source (4.13, a very high score).

Table 6. Q2. To what extent do you agree/disagree with the following statements?
(Mean rating, 1= Strongly disagree to 5= strongly agree)

Item	<=30			>30			All	d
	M	n	SD	M	N	SD	M	
Peer reviewed journals are the most trustworthy information source.	3.85	364	0.99	4.16	2636	0.84	4.13	0.34*
The journal's Impact Factor is important for deciding what to read.	3.37	365	1.13	3.01	2632	1.18	3.05	0.31**
When pressed for time, the ease of availability of a source over-takes considerations about its quality.	3.20	365	1.15	2.65	2626	1.17	2.72	0.47*
If the information is not central to my research area, the ease of availability of a source is more important than its quality.	2.95	363	1.18	2.73	2623	1.13	2.76	0.19**

* Significant at p <0.001, ** significant at p <0.01

From the above it seems clear that younger researchers, again, relied more heavily on trust proxies, such as impact factors, and expend less effort on obtaining information, and, as a consequence, are more likely to compromise on quality. In some of the focus groups, this tendency was also mentioned by senior researchers with respect to their younger ones. Senior researchers see younger researchers as a work in progress who still need mentoring. It could also be that the younger researchers, quite understandably, lack confidence in their own judgements, which is so much a characteristic of the behaviour of older researchers. Older researchers, in marked contrast, are strongly wedded

to peer review. The question has to be asked, if they are so keen on checking the information source using their own judgement and well-tried ways of judging, why do they insist so strongly upon the filter of peer review? Probably the answer lies in the fact that peer review is the very first filter, but it is not the only one. Thus, if an article is peer reviewed, it deserves more in-depth scrutiny; if it's not, it is not given another glance. Thus, for younger researchers, the badge of trust was very much the impact factor while, in contrast, for older researchers it was peer review. The two, of course, are not mutually exclusive.

4.2. Dissemination/publishing

This is the activity where academic careers and reputations are made and clearly trustworthiness is a really major factor here. Publishing focuses the academic mind on trustworthiness and this means we can get closer to the processes and issues involved with decision making. Two questions were asked in order to understand the behaviour associated with publishing: 1) what were the attributes looked for when deciding where to publish research; 2) whether they agreed or not with statements made about places where researchers send their research.

4.2.1. Important attributes of a publishing outlet

Researchers were asked to rate ten scholarly outlets on a scale of Extremely Important (1), Very Important (2), Important (3), Somewhat Important (4), Not Important (5). Table 3 shows the 7 for which there were statistically significant differences between younger and older researchers. The mean rating of the statements were calculated and are given for the two age groups in columns 2 and 5. For both groups peer review was the most important attribute of a publishing outlet, but notably more so in the case of older researchers (4.15 as compared to 3.85 for younger researchers). However, when it came to deciding where to publish younger researchers considered being highly cited (3.66), being open access (2.82) and being based in a country known for the quality of its research (2.57) to be more important (Table 7).

In addition to peer review older researchers considered the fact that an outlet was published by a society in the field to be more important (2.80). The effect size values for the other two statements (having both online and print versions, and being published by a traditional publisher) are too small to indicate any meaningful differences.

From the above it seems that younger researchers view open access publications more positively because they offers more choice and hence helps them to establish their reputations more quickly. It should, however, be said that in the light of responses to questions elsewhere in the survey younger and older researchers expressed the belief that peer review confers legitimacy on open access publications. Also, again, it is obvious that the younger researchers rely more on trust markers and proxies, such as citations. This was also borne out by senior researchers and editors in focus groups and interviews who, when asked whether their younger colleagues approached things differently, universally said that, if anything, younger researchers were even more fixated on citation metrics, because they still have career ladders to climb. Older researchers were clearly more conservative, for them the placement of research papers was more to do with their contacts than metrics.

Table 7. Q3. As an author, how important are the following attributes of an outlet when deciding where to disseminate/publish your research work?
(Mean rating, 1= not important to 5= extremely important)

Item	<=30			>30			All	d
	M	n	SD	M	n	SD	M	
It is peer reviewed	3.85	363	1.14	4.15	2632	1.00	4.11	0.28*
It is highly cited	3.66	364	1.16	3.33	2637	1.16	3.37	0.28*
It is published by a traditional scholarly publisher	3.29	363	1.17	3.45	2633	1.16	3.43	0.14**
It is published by a society in my field	3.25	363	1.28	2.80	2612	1.30	2.85	0.35*
It has both an online and a print version	2.96	363	1.46	2.80	2632	1.39	2.82	0.11**
It is Open Access	2.82	362	1.23	2.41	2629	1.27	2.46	0.33*
It is based in a country known for the quality of its research	2.57	364	1.37	2.25	2622	1.27	2.29	0.24*

* Significant at p <0.001, ** significant at p <0.05

4.2.2. Levels of agreement with statements on places to publish/disseminate research

Researchers were asked whether they agreed or not with nine statements about the trustworthiness or otherwise of publishing outlets. Table 8 shows the levels of agreement and the scale is: Strongly agree (1), Agree (2), Neither agree nor disagree (3), Disagree (4), Strongly disagree (5). The mean rating of the statements are given for the two age groups in columns 2 and 5. Only the statements for which there were statistically significant differences are shown. Both groups agreed most with the statement "People who don't have tenure have to publish in good journals to build up a reputation". Younger researchers rating was 3.72 and that for the older researchers was 3.87. There are though many differences between the groups with younger researchers agreeing more strongly with 8 statements (the last 8 statements in Table 8). So, there are real differences in behaviour and attitude on show here.

On the other hand, older researchers agree more strongly with the first two statements (in Table 8), but their effect size values are too small for differences to be very meaningful.

Although the findings yield ample evidence that both age groups agreed on the strategic importance of publishing in high IF journals, younger researchers clearly used all the outlets available to them (such as repositories, proceedings, own website) in order to ensure their work is published and in this respect made most use of the new (social media) digital services with which they were more familiar. The largest effect size values belong to the two statements relating to social media ('I tend to blog⋯' and 'I use social media⋯').

Focus groups showed that, despite the aforementioned finding in regard to dissemination via the social media, younger researchers were reticent to contribute too much to the social media, largely because they did not want to let themselves down by showing what they thought might be viewed by their seniors as immaturity. They were worried that social media could have a negative impact on career development: "It is so easy to comment today and in the digital world the record it always there. So, say you said something premature or immature twenty years ago, it could

come back and bite you at a crucial time in your career development." Older social science researchers attending the focus groups did admit to using social media to derive new/fresh ideas and for outreach, largely to connect to the public and practitioners.

Table 8. Q4. To what extent do you agree/disagree with the following statements concerning the quality and trustworthiness of places to publish/disseminate your research? (Mean rating, 1= Strongly disagree to 5= strongly agree)

Item	<=30			>30			All	d
	M	n	SD	M	n	SD	M	
People who don't have tenure have to publish in good journals to build up a reputation.	3.72	365	1.09	3.87	2631	1.02	3.86	0.14**
I publish in journals because a paper placed in a journal obtains a context, becomes part of a 'conversation'.	3.41	366	1.15	3.54	2628	1.08	3.53	0.12***
I tend to publish first in a conference proceedings, which is a good way to test the veracity of my ideas.	3.28	360	1.30	2.76	2614	1.28	2.83	0.40*
I tend to publish first in a conference proceedings, because it is a reliable way to reach my target audiences.	3.23	364	1.27	2.82	2619	1.19	2.87	0.33*
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.	3.23	359	1.36	2.73	2611	1.50	2.79	0.35*
Depositing a version of my published work in an institutional repository increases usage and thereby helps to build up my professional reputation among my peers.	3.14	362	1.39	2.74	2616	1.49	2.79	0.28*
I use social media (e.g. Twitter, blogs, social networks) to get out information about my research because it is a reliable way to reach my target audiences.	2.84	365	1.26	2.26	2620	1.27	2.33	0.46*
My own website is central for ensuring the reliable dissemination of my work to my target audiences.	2.73	360	1.50	2.46	2615	1.41	2.49	0.19**
I tend to blog about the findings of my research, which is a good way to test the veracity of my ideas.	2.72	361	1.36	2.03	2604	1.22	2.11	0.53*
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.	2.56	362	1.47	2.13	2606	1.25	2.18	0.32*

* Significant at p <0.001, ** significant at p <0.01, *** significant at p <0.05

4.3. Citing

In terms of importance citing comes somewhere between usage and publishing. It's a prescribed and important activity for scholars, which comes with certain rules, but is not nearly as important as publishing is towards career development. However, researchers read many articles and only cite a few of them, so selection is required and trustworthiness assessed as part of the citing process.

4.3.1. Popularity of citing practices

Ten citation practices were presented for consideration and researchers were asked to consider how characteristic or prevalent they were in their field and to represent this on a five-point scale, with 1 being not characteristic and 5 being very characteristic (Table 9). Note the question was not asking about the practices of the individuals because it was felt that researchers might not answer honestly (some practices could be constituted as 'gaming' and hence frowned upon), but about the prevalence of the practice in their own disciplines/specialities.

The practice of 'citing the most highly cited information sources' was seen as being the most prevalent by both groups. However, younger researchers saw a large number of the practices, in fact all of the ten practices presented in Table 9, as being more characteristic of their fields.

Younger researchers' appreciation of the citing practices of their discipline again testifies to the point of view of the aspiring newcomer to the profession. Thus, they placed a greater emphasis on whatever it takes to increase a paper's chances of acceptance, as well as on the importance of improving one's citation ranking. Very much in line with their previously noted greater willingness to compromise on quality, their attitude towards the non-peer reviewed/open peer-reviewed or unofficial version of some sources was more accepting to them than that of their older colleagues, aware as they are that the accepted practice was citing the highly cited formal publications.

Table 9. Q5. How characteristic of your discipline are each of the citing practices listed below? (Mean rating, 1= not characteristic to 5= very characteristic)

Item	<=30			>30			All	d
	M	n	SD	M	n	SD	M	
Citing the most highly cited information sources	3.57	361	1.13	3.22	2621	1.25	3.26	0.29*
Citing the first information source published on a topic	3.22	358	1.31	2.89	2606	1.29	2.93	0.25*
Citing one's own work to improve one's citation ranking (e.g. H-Index)	2.86	358	1.42	2.50	2609	1.40	2.55	0.26*
Citing papers in the journal to which an article is submitted for publication to increase chances of acceptance	2.82	359	1.50	2.31	2617	1.49	2.37	0.34*
Citing papers mentioned by reviewers to increase chances of acceptance	3.06	356	1.47	2.63	2611	1.54	2.68	0.29*
Citing non-peer reviewed sources (e.g. personal correspondence, newspaper articles, blogs, tweets)	2.14	355	1.37	1.69	2618	1.07	1.74	0.37*
Citing a pre-print which has not yet been accepted by a journal	2.20	356	1.32	1.77	2613	1.07	1.82	0.36*
Citing sources disseminated with comments posted on a dedicated website (open peer review)	1.98	353	1.40	1.46	2612	1.05	1.52	0.42*
Citing, if possible, only sources published in developed countries	2.24	354	1.39	1.70	2611	1.20	1.76	0.42*
Citing the published version of record, but reading another version found on the open web	2.32	354	1.45	1.68	2603	1.37	1.76	0.45*

* Significant at p <0.001

4.3.2. Levels of agreement with statements concerning the quality and trustworthiness of sources cited

Researchers were asked the extent to which they agreed/disagreed with statements presented to them concerning the quality and trustworthiness of the sources they cite and rate them on a scale of: Strongly agree (1), Agree (2), Neither agree nor disagree (3), Disagree (4), Strongly disagree (5). Of the statements listed in Table 10 both groups of researchers agreed most with the statement 'From a trust perspective I'm more easy-going in what I read than what I cite'. Young researchers agreed more strongly with all of the three statements about citing practices. However, the effect size values are too small for the first two statements (in Table 10) to read too much into these differences, therefore, more research is needed to clarify whether younger researchers are really more willing to use any means to improve their chances of acceptance and are much more liberal in their citation behaviour generally. Clearly though, citing for them is about getting a foot on the ladder, making their own imprint and, perhaps, being simply more honest and less political in their answers.

Table 10. Q6. To what extent do you agree/disagree with the following statements concerning the quality and trustworthiness of the sources you cite?
(Mean rating, 1= Strongly disagree to 5= strongly agree)

Item	<=30			>30			All	d
	M	n	SD	M	n	SD	M	
From a trust perspective I'm more easy-going in what I read than what I cite.	3.65	362	1.10	3.51	2616	1.14	3.53	0.12***
I don't cite articles published in Open Access journals because they are of low quality.	2.34	361	1.19	2.16	2618	1.03	2.19	0.16**
The journal Impact Factor is important for deciding what to cite.	3.33	362	1.28	2.71	2617	1.29	2.78	0.48*

* Significant at p <0.001, ** significant at p <0.01, *** significant at p <0.05

4.4. Changes to the scholarly environment

With so much change going on in scholarly communications it was interesting to learn what researchers made of it all. Were, for instance, conditions getting better or worse and what were the 'ups and downs'? In order to find out researchers were asked to what extent they agreed with a range of scenarios representing what focus group participants and interviewees though had happened to their research field over the past decade or so. Young researchers agreed strongly with all of the statements presented in Table 11.

From the results it can be seen that younger researchers were highly appreciative of changes that have resulted in an improvement in the availability of quality filters (metrics), but it is not clear why younger researchers were so pessimistic about standards, quality and decency in scholarly communication. It could be that the new generation of researchers, born into the realities of a postmodernist society characterised by a plurality of values, diversity, change and a questioning of authority, adopt a more sceptical attitude to scholarly standards and measures of quality assurance

in general. Maybe younger scholars just take the good with the bad, have an acceptance of a borderless information world, where there are no barriers to information access and see that as the only strategy to adopt.

Table 11. Q7. To what extent do these statements represent what has happened in your research field over the past decade or so? (Mean rating, 1= Strongly disagree to 5= strongly agree)

Item	<=30 M	n	SD	>30 M	n	SD	All M	d
There are more outlets, it is easier to get published and as a result, there is a flood of poor quality material.	3.21	360	1.51	3.03	2615	1.43	3.05	0.12***
There is a less strict/ less rigorous peer review process and as a result, there is a flood of poor quality material.	2.92	359	1.49	2.70	2607	1.44	2.73	0.15**
More researchers entering the field have raised standards.	3.39	357	1.44	2.80	2598	1.55	2.87	0.39*
There are more unethical practices (e.g. plagiarism, falsifying, fabricating, citation gaming).	2.79	360	1.72	2.29	2606	1.73	2.35	0.29*
Easily available metrics make the evaluation of trustworthiness easier.	3.12	358	1.56	2.43	2598	1.57	2.51	0.44*
The closer ties with researchers in my field, enabled by digital communication, make it easier for me to judge the trustworthiness of material.	3.57	359	1.34	3.14	2597	1.50	3.19	0.30*

* significant at $p < 0.001$, ** significant at $p < 0.01$, *** significant at $p < 0.05$

5. Conclusions

In respect to activities undertaken to establish what to use younger researchers rated more highly than their older colleagues four activities (Q1): a) checking author's country of affiliation; b) checking the number of downloads an item has obtained; c), checking where the source was obtained from; d) taking account of colleagues' opinions. Younger researchers also agreed more strongly than their older colleagues that (Q2): a) the journal's impact factor was important in deciding what to read; b) if the information was not central to their specialism, the ease of availability of a source was more important to them than its quality; c) when pressed for time, the ease of availability of a source overtook considerations about its quality.

When it came to deciding where to publish younger researchers considered being highly cited, being open access and being based in a country known for the quality of its research to be more important than older researchers (Q3). Younger researchers were also more likely to use all the outlets available to them in order to improve the chances of ensuring their work is published and, in this respect, made the most use of the social media with which they are more familiar (Q4). In respect to citing younger researchers were much more willing to adopt all types of citation practice to enhance the chances of getting their papers accepted (Q5). They also appeared to be

more likely to believe that it was a good idea to cite high impact factor sources, although it has to be said the evidence is not conclusive (Q6). Regarding their attitudes towards change, younger researchers were more pessimistic about scholarly standards and the quality of research, but this might be a result of their greater pragmatism (Q7).

Altogether the data confirms that younger researchers were true to their stereotype in that they expended less effort to obtain information and hence were more likely to compromise on quality; b) viewed open access publications more positively because they offered them more publication choices and helped them establish their reputations more quickly; c) compensated for their lack of experience by relying more heavily on trust markers and proxies, such as impact factors. Clearly the new forms of scholarly communication offer much to younger researchers in that they enable them to get on the scholarly communications ladder more easily and make their mark more quickly. To continue the analogy, social media offers them a rung low enough for them to get on to. For younger researchers the increasingly open environment comes with its ups and downs and they are happy to embrace both; perhaps Generation Y are becoming the risk generation?

So, does Generation Y represent the thin end of the wedge or are we witnessing just a passing and transitory phase in behaviour? It has to be said that the jury is out on this, but clearly they were more sceptical and neurologists tell us that their behaviour in regard to skittering and the social media is already rewiring the brain (Carr, 2010), which suggests they are more likely to take their attitudes and behaviour with them as they climb the scholarly ladder. However, the focus groups and interviews that informed the questionnaire study would seem to indicate that the wedge seems to be more populated by young social scientists and humanities scholars. The explanation for this might possibly lie with the fact that social scientists are more interested in ideas and scientists more interested in hard and validated evidence; and the latter have far fewer degree of freedom in their scholarly activities and especially so in an environment in which they will publish in multi-authored papers; inevitably they do have to confirm more.

Of course, everyone, young and old, has to play homage to a system that prizes publication in high impact factors journals above all else. Grants and promotion depend on it (Harley, 2010). Nevertheless there are many differences between how younger and older researchers place their trust when it comes to using, citing and publishing scholarly communications.

We are told by commentators that the younger generations are not 'stable' and they naturally want to use different platforms than their mothers and fathers and maybe this extends to their managers and professors (Chudziak, 2015). So we might be seeing more differences emerging down the line. Only time and further research will tell. However, clearly there are signs of changes in the way young scholars use the scholarly communication system and librarians and publishers are going to have to full cognisance of this if they wish to remain close to their markets.

Finally, a word of caution concerning the study findings. It needs to be noted that this study has some limitations. Researchers 30 and younger were only about 10 per cent of the population. Although we found many statistically significant differences, the effect size of all of them are small or intermediate and this is pointed out in the text. The other issue to note is that while using age to identify career maturity is acceptable if fails to take account of some 'returning scholars' who have entered the scholarly community at a later age and who may still be less established,

untenured researchers. Therefore, although the study indicates that there are some differences between young and older scholars more research is needed to explore these differences.

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• **About the authors:**

David Nicholas
Email: Dave.Nicholas@ciber-research.eu

- *EDUCATION*
  PhD (Information Science), City University, London, 1996
  MPhil (Information Science), London Metropolitan University, 1978
  ALA (Associate of the Library Association), London Metropolitan University, 1968

- *CAREER*
  David Nicholas is the Director of the CIBER research group (http://ciber-research.eu). The group is best known for monitoring behaviours in the virtual space, especially in regard to the virtual scholar and the Google Generation, which has been featured widely in the media, including BBC TV. David is also a professor at the University of Tennessee, University of Northumbria and Tomsk State University (Siberia). Previously David was Head of the Department of Information Studies at University College London (2004 – 2011) and previous to that was Head of the Department of Information Science at City University, London. David's interests also include the digital consumer, mobile information (information on-the-go), e-book and e-journal usage and scholarly communications. David has undertaken more than 70 funded research studies, published more than a dozen books and over four-hundred peer reviewed articles.