TRUST IN RESEARCH

Researcher survey results

June 2019
Background and approach

Research objective is to: Examine the drivers and influences on the communication of scholarly research.

About the survey

Trust in research survey

- 3133 researchers responded to a survey of 98160 individuals randomly selected from database of 3.6 million researchers (3.2 % response rate).
- Survey tool: Co-branded (Elsevier and Sense About Science) online survey available in English only. Survey took 15 minutes to complete (median average). Fieldwork took place in May 2019.

Search and discovery activities

- 1450 researchers responded to a survey of 105418 individuals randomly selected from database of 3.6 million researchers (1.4% response rate).
- Survey tool: Unbranded online survey available in English only. Survey took 17 minutes to complete (median average). Fieldwork took place in Jan-Feb 2019.
- Results: Responses have been weighted to be representative of the global researcher population by country (UNESCO 2014 data). Base sizes shown in this report are unweighted unless otherwise stated.

About Sense About Science

Sense about Science is an independent charity that challenges misrepresentation of science and evidence in public life.

About Elsevier

A global information analytics business specializing in science and health helping institutions and professionals progress science, advance healthcare and improve performance for the benefit of humanity.
TRUST IN RESEARCH
OVERVIEW OF RESULTS
TRUSTWORTHINESS OF RESEARCH OUTPUTS: Although 62% of researchers trust the majority of research outputs, a proportion doubt the quality of some of the research outputs they encounter. To compensate they check supplementary material/data carefully, read only information associated with peer reviewed journals or seek corroboration from other trusted sources.

Which of the following mechanisms do you employ to compensate for any lack of confidence you have in the content you are considering reading/accessing?

- Check supplementary material or data carefully: 57%
- Only read/access content that is in or linked to a peer reviewed journal: 52%
- Seek corroboration from other trusted sources (e.g. see if research is cited in a known journal): 52%
- Read/access research from researchers I know: 37%
- Read/access research from specific institutes: 29%
- Only read/access research that has been personally recommended: 6%
- Other (please specify): 7%

Thinking about the various research outputs that you interacted with (or encountered) last week what proportion of the outputs would you consider trustworthy?

- None of them: 1%
- Some of them: 21%
- About half of them: 15%
- The majority of them: 48%
- All of them: 14%

Base: All respondents (n=3133)

Base: All respondents that do not think all research outputs are trustworthy (n=2715)
REASONS RESEARCH OUTPUTS ARE REGARDED AS UNTRUSTWORTHY: for those researchers who rate at least some outputs as untrustworthy there are a variety of factors influencing them.

You indicated that some/all of the research outputs are trustworthy. Why do you think all/some of the content you encounter is not trustworthy?

Inhibitors of trust

- Unclear if peer reviewed
- Not peer reviewed
- Low quality peer review
- Peer review scope

Components of mistrust

- New research outputs (preprints, data)
- Unsupported claims: Poor conclusions drawn
- Predatory journals
- Errors: inflated statistical power / grammatical/calculations
- Methodological flaws
- Lack of supplementary material
- Reduced focus on novel/ high-quality research
- Biases (in peer review, funding, negative findings not published)

Forces driving volume of research

- Pressure to publish
- Growth in researchers
- Open Science

“Content that comes from predatory journals is not trustworthy. It is not rigorously peer reviewed. This diminishes the trust in scientific research. As scientists we need to be held to a high standard. The traditional peer review system does that.” (Physician, USA, prefer not to say age)

“Not familiar with the journals or media/not sure what the peer review process might be, or how reviewers are selected” (Psychology, United States of America, 26 to 35)

“Experiments poorly designed, some analyses seemed suspect, areas that I know well improperly characterized” (Environmental Sciences, Canada, Over 65)

“There is published Research biased by financial or other Support to the authors and not properly declared.” (Medicine and Allied Health, Switzerland, 56 to 65)

“Authors often do not provide data/code/tools/proper description of the scenarios used for the evaluation contained in their papers. In particular, the correctness of code used for simulations reported in papers is often unverifiable.” (Computer Sciences / IT, Brazil, 26 to 35)
Reasons research outputs are regarded as untrustworthy: of those researchers that rate at least some outputs as untrustworthy; the main reasons are poor interpretation, lack of clarity of the peer review process and flaws in the methodology.

You indicated that some/all of the research outputs are trustworthy. Why do you think all/some of the content you encounter is not trustworthy?

- Poor conclusions drawn | Exaggerated findings | Lack of information or detail provided: 25%
- Lack of peer review: 19%
- Methodological flaws e.g. Reproducibility / generalisability / incorrect methods used: 17%
- Bias e.g. Peer review / funding source / data falsification / pressure to publish = lower quality / negative findings not published: 15%
- Lack of supplementary material | Unable to validate conclusions: 12%
- Negative perception of source: Website/author(s)/predatory journals: 11%
- Errors: Grammatical / citation / inflated statistical power / calculations / code: 9%
Thinking about public confidence in research evidence, how much, if at all, do you believe any of the following are a problem?

<table>
<thead>
<tr>
<th>Problem</th>
<th>Large</th>
<th>Medium</th>
<th>Small</th>
<th>Not a problem at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misinterpretation of research outcomes in media, policy or public discussion</td>
<td>49%</td>
<td>33%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>Deliberate misrepresentation by media</td>
<td>43%</td>
<td>30%</td>
<td>21%</td>
<td>6%</td>
</tr>
<tr>
<td>Increased low quality research available (i.e. research meets minimum technical standard only)</td>
<td>41%</td>
<td>37%</td>
<td>17%</td>
<td>6%</td>
</tr>
<tr>
<td>Difficulty in distinguishing high quality research</td>
<td>38%</td>
<td>37%</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td>Too many non-peer reviewed research publications</td>
<td>37%</td>
<td>33%</td>
<td>20%</td>
<td>9%</td>
</tr>
<tr>
<td>Deliberate misrepresentation by researchers/their institutions</td>
<td>33%</td>
<td>30%</td>
<td>28%</td>
<td>8%</td>
</tr>
<tr>
<td>Volume of information</td>
<td>28%</td>
<td>35%</td>
<td>23%</td>
<td>15%</td>
</tr>
<tr>
<td>Misinterpretation of research outcomes by researchers/their institutions</td>
<td>26%</td>
<td>37%</td>
<td>30%</td>
<td>7%</td>
</tr>
<tr>
<td>Contradictory research findings published (e.g. research from different groups have opposing conclusions)</td>
<td>21%</td>
<td>32%</td>
<td>25%</td>
<td>23%</td>
</tr>
<tr>
<td>Increased alternative sources (e.g. different versions of articles: preprint, accepted, published)</td>
<td>13%</td>
<td>25%</td>
<td>30%</td>
<td>31%</td>
</tr>
<tr>
<td>Large number of competing platforms providing access to the same research outputs</td>
<td>11%</td>
<td>24%</td>
<td>26%</td>
<td>39%</td>
</tr>
</tbody>
</table>
COMMUNICATION TO THE PUBLIC: Explaining research in lay terms is seen as the best way to help people outside the research community judge the quality of research.

To help people outside the research community judge the quality of research articles they view, which of the following would be most helpful?

- Explain research context, findings and implications in lay terms: 70%
- Enable them to ask questions of the authors (e.g. discussion to be posted alongside the article): 40%
- Clear explanation of peer review and make it easily accessible from content (e.g. how many people involved, their role): 38%
- Peer reviewed content is clearly marked as such: 35%
- Enable updates to the article after publication (e.g. as more work is done on the topic by author): 35%
- Provide guidance on statistics (e.g. probability): 30%

Base: All respondents (n=3133)
TRUST IN RESEARCH
Demographics
Demographics

Subject
- Chemistry: 5%
- Computer Science: 6%
- Earth & Env. Science: 8%
- Engineering: 16%
- Life Sciences: 19%
- Material Science: 5%
- Maths: 4%
- Medicine and AH: 12%
- Physics & Astronomy: 8%
- SSE + Arts Hum: 17%

Age
- Under 26: 0.5%
- 26-35: 16%
- 36-45: 27%
- 46-55: 24%
- 56-65: 18%
- Over 65: 12%
- Prefer not to say: 2%

Country
- China: 20%
- USA: 17%
- Japan: 9%
- Russia: 6%
- Germany: 5%
- Rep. of Korea: 5%
- UK: 4%
- France: 4%
- India: 3%
- Canada: 2%
- Other countries: 27%

Region
- North America: 19%
- Western Europe: 21%
- Eastern Europe: 10%
- Middle East: 41%
- APAC: 41%
- Africa: 2%

Organization
- University: 66%
- Research Institute: 16%
- Hospital / Med. Sch.: 5%
- Commercial / Corp.: 4%
- Government: 3%
- College: 2%
- Other: 2%

Position
- Head of Dept./ Senior Management: 16%
- Senior Researcher/ Middle Management: 36%
- Researcher/ Staff Member: 37%
- Other: 11%

Role
- Research and/or development: 48%
- R&D and teaching equally: 21%
- Teaching: 16%
- Practitioner (clinical): 5%
- Mgmt/Admin.: 4%
- Advisory/Consultancy: 2%
- Practitioner (eng./tech.): 1%
- Other: 3%

Number of articles published
- 5 or fewer: 8%
- 6-15: 18%
- 16-25: 17%
- 26-50: 21%
- 51-75: 11%
- 76-100: 8%
- 101-200: 10%
- Over 200: 5%
SEARCH AND DISCOVERY ACTIVITIES
OVERVIEW OF RESULTS
SEARCH AND DISCOVERY OVERVIEW: On average, researchers spend just over four hours searching for research articles a week and more than 5 hours reading them. They read 5-6 articles per week and half are considered useful.

On average how much time do you spend searching for research articles per week?

- Less than an hour: 16%
- 1 to 2 hours: 35%
- 3 to 5 hours: 28%
- 6 to 10 hours: 12%
- 11 to 15 hours: 3%
- More than 15 hours: 6%

On average how much time do you spend reading research articles per week?

- Less than an hour: 7%
- 1 to 2 hours: 28%
- 3 to 5 hours: 34%
- 6 to 10 hours: 17%
- 11 to 15 hours: 8%
- More than 15 hours: 7%

On average how many articles do you read per week?

- None: 2%
- 1 article: 14%
- 2 to 4 articles: 46%
- 5 to 9 articles: 24%
- 10 to 15 articles: 10%
- 16 to 30 articles: 3%
- More than 30 articles: 1%

Approximately what percentage of the research articles you read per week do you find useful?

- 50% in 2016
- 56% in 2013

*‘Articles downloaded’ in 2013 and 2014

Base: 2016 n= 1691; 2014 n=2344; 2013 n=3001
SEARCH AND DISCOVERY
Demographics
Demographics

Subject
- Chemistry: 3%
- Computer Science: 8%
- Earth & Env. Science: 9%
- Engineering: 13%
- Life Sciences: 19%
- Material Science: 4%
- Maths: 5%
- Medicine and AH: 14%
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- SSE + Arts Hum: 18%

Country
- China: 20%
- USA: 17%
- Japan: 9%
- Russia: 6%
- Germany: 5%
- UK: 4%
- France: 4%
- India: 3%
- Canada: 2%
- Brazil: 2%
- Other countries: 30%

Region
- North America: 19%
- Western Europe: 21%
- Eastern Europe: 10%
- APAC: 41%
- Latin America: 4%
- Africa: 2%

Organization
- University or college: 64%
- Research Institute: 18%
- Medical School/hospital: 7%
- Corporate/commercial: 5%
- Government: 3%
- Other NGO/NPO/non-profit/charity: 1%
- Other: 2%

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- Under 26: 0%
- 26-35: 15%
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- Head of Dept./ Senior Management: 15%
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