

Bad science and misrepresentation

Science aims to generate new knowledge with the utmost care and methodological rigour. Unfortunately, misrepresentation of research results and the publication of bad studies or false information also occur in science. This is a major challenge for science because it undermines trust. How do these “mistakes” happen?

Mistakes leading to misinterpretations happen at different levels 

At the level of science: “Publish or perish” describes the pressure on scientists to publish a lot because, unfortunately, their quality as researchers is still too often measured solely by the number of papers they publish. This leads some scientists to publish study results that wouldn’t stand up to peer review in so-called predatory journals – journals that claim to be serious academic journals but don’t provide peer review or editorial services. This is called bad science. In the worst case, these “bad studies” are picked up by the media. Even if only a small fraction of researchers choose this path, the damage to the scientific community is great. But even serious scientists can make more or less intentional mistakes. To increase the likelihood of being accepted by journals and picked up by the media, scientists may be tempted to make their research results more positive than they are, either through exaggeration or spin. A correlation may sometimes be turned into causation, a finding in animal experiments into a confirmed finding in humans...

At the level of communications departments: Further errors can occur when study results are translated into press releases, either by the journals themselves or by the scientific institutions. A 2014 study found that the majority of press releases about selected medical trials contained exaggerations^[48]. Social media posts also run the risk of contributing to misrepresentation, such as through

oversimplification. Science communicators, sometimes urged by their superiors, therefore have an important responsibility to check claims carefully before publishing.

At the mass media level: The media can also contribute to the misrepresentation of research findings, such as by using oversimplified language, avoiding complexity, exaggerating and sensationalising. One study showed that this is much more likely to happen when exaggeration has already occurred at the level of the press release^[48]. Such exaggeration can be damaging, as it can create false hope, spread fear or destroy trust in science, for example.

Manufactured doubt: Finally, science can be deliberately misrepresented through manufactured doubt or fake news (see Essential 44). The term “manufactured doubt” is used when known facts and empirical evidence are deliberately altered to promote an agenda, often to make a company or a whole industry appear in a better light. The manipulated version of the facts is very close to the truth but difficult to identify as a lie^[49].



Recommended reads:

- ♦ Goldacre B. (2008), *Bad Science*, fourth Estate, London, ISBN: 978-0-00-724019-7 <https://archive.org/details/bad-science>
- ♦ Sumner et al. (2014), *The association between exaggeration in health related science news and academic press releases: retrospective observational study*. BMJ 349:7015. <https://doi.org/10.1136/bmj.g7015>
- ♦ Goldberg R.F. & Vandenberg L.N. (2021), *The science of spin: targeted strategies to manufacture doubt with detrimental effects on environmental and public health*. Environ Health 20, 33. <https://doi.org/10.1186/s12940-021-00723-0>