## Professor Kevin McConway and Professor Sir David Spiegelhalter— written evidence (FOJ0052)

### House of Lords Communications and Digital Committee inquiry on the Future of Journalism

*The need for data literacy in journalism*

1. Though our original background is as statisticians in academia, we both have a long-standing interest and record of engagement with journalists and others in the media industry. Professor Kevin McConway worked with the production team for the BBC Radio 4 programme *More or Less*[1] for 11 years, as part of his previous role as Professor of Applied Statistics at the Open University. He is currently a trustee and member of the Advisory Committee of the Science Media Centre[2]. Through the Centre and through many other organisations, he runs training events and workshops for journalists and press officers on statistics and scientific methods. Professor Sir David Spiegelhalter is Chairman of the Winton Centre for Risk and Evidence Communication[3] and Fellow of Churchill College in the University of Cambridge, having recently retired from his position as Winton Professor of Public Understanding of Risk, and is a frequent media communicator on risk and statistics, particularly during the Covid-19 crisis.

2. One aspect (very far from the only one) of the impact of digital technologies on journalism is that stories are increasingly likely to be based on data, often but not always 'big data'. Data-based stories in the media are nothing new; for instance, a major content analysis[4] of almost 7,000 items of UK broadcast news found that over 1 in 5 items – 22 per cent – featured a reference to statistics, a ratio that increased to one in three items in online news. The current media coverage of the Covid-19 pandemic is an example both of the ubiquity of data and of the confusion that can arise in dealing with data-based stories. And as more and more private and public decision-making is based on data, the preponderance of data in the news is likely to increase even more.

3. *Data literacy* is increasingly recognised as a vital skill in contemporary society. It may comprise abilities to analyse data, to draw appropriate conclusions, to communicate, and to critique uses of data and conclusions drawn from data. We are not referring here to technical and complicated uses of statistics and data science, but primarily to an ability to make sense of arguments involving data, and to critique appropriately uses of data by others.

4. There exist a fairly small number of 'data journalists' who are capable of handling raw data and producing visualisations and basic, or even quite complex, analyses – these are not our concern here.

5. There are other journalists who to some extent understand the strengths and limitations of data, and can communicate effectively about data in media

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1 https://www.bbc.co.uk/programmes/b006qshd

2 https://www.sciencemediacentre.org/

3 https://wintoncentre.maths.cam.ac.uk/

4 http://downloads.bbc.co.uk/bbctrust/assets/files/pdf/our_work/stats_impartiality/content_analysis.pdf. See also Cushion, S. and Lewis, J. (2018) 'More Light, Less Heat: Rethinking Impartiality in Light of a Review into the Reporting of Statistics in UK News Media', Ch. 2, in Nguyen, A. (ed.) *News, Numbers and Public Opinion in a Data-Driven World,* London: Bloomsbury. *[And loads more stuff by Cushion and others on this…]*

stories. But there are not many of them, and (given all the pressures on newsrooms and media organisations) not all media outlets can afford to employ specialists with these skills.

6. Meanwhile, perhaps more so in the UK than elsewhere, among the bulk of journalists who do not currently work much with data and statistics, there is a culture of innumeracy. People whose skills lie in dealing with numbers have not been going into journalism in large quantities, and journalism has been (and to some extent still is) seen as something for people who are good with words, and quite possibly bad with numbers[5].

7. In the UK, the National Council for the Training of Journalists (NCTJ) does not include anything compulsory on numeracy, mathematics, dealing with and writing about numbers, or data, in its syllabus for its Diploma in Journalism, which is also its basis for accrediting journalism courses from other providers such as universities and colleges. There is an optional module in data journalism, but it makes up a very small part of the qualification even if a student chooses it.

8. Accreditation by the NCTJ is far from a universal feature of university journalism education in the UK, but the position on data literacy is similar in most undergraduate and general postgraduate university courses. several undergraduate courses require no mathematics qualifications at all on entry, and of those that do, the typical requirement would be a grade 4 or C pass in GCSE mathematics. That is not an indicator of anything beyond a fairly basic level of skill in dealing with numbers and symbols, and by the time the graduates get through A levels and eventually leave their journalism course, they may well have forgotten even that. Of course. there are exceptions to this, and many universities will offer some relevant further training (though usually optional[6]). For instance, the BA Journalism course at City, University of London, allows students to include a module on "Lies, Damned Lies and Statistics", as an option, but this is provided by the Sociology department. It is notable that all students studying many social sciences must take this as a compulsory module in their first year, while it is available only as a second-year option to journalism students. But is this approach to data and statistics enough for our data-driven world? Is it enough even given the preponderance of statistics in the mainstream media today?

9. Things are slightly better elsewhere. In the USA, the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC) does require, in its rather long list of standards for accreditation of courses[7], that graduates should be able to "apply basic numerical and statistical concepts". The actual level of data literacy required to meet this standard seems to be fairly low – but at least there *is* a requirement.

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5 See, for instance:
Nguyen, A. and Lugo-Ocando, J. (2016) 'The state of data and statistics in journalism and journalism education: Issues and debates', *Journalism*, **17**, 3-17. http://dx.doi.org/10.1177/1464884915593234.
Harrison, S. (2016) 'Journalists, Numeracy and Cultural Capital.' *Numeracy,* **9**, Iss.2. http://dx.doi.org/10.5038/1936-4660.9.2.3. Also relevant is a report in the *Press Gazette* of a 2008 meeting: https://www.pressgazette.co.uk/journalists-lack-basic-numeracy-skills-needed-to-report-on-business/ .

6 The highly respected BA in Journalism and Communications at Cardiff University does require all students to take a module called 'Data Journalism in Theory and Practice', making up one-sixth of their second year – but this is an exception to the typical position.*[Worth saying or not?]*

7 http://www.acejmc.org/policies-process/nine-standards/

10. Working with and teaching data literacy in a journalism context is no mystery, and good materials and experience trainers and teachers are available in the UK (and elsewhere). Good content and high-quality approaches are available in some UK university journalism departments. The Royal Statistical Society (RSS) has made an online course and other advice and materials available[8]. It is worth noting that this material was produced some years ago, largely with a limited amount of funding from the UK government (through the then Department for Business, Innovation and Skills (BIS), as part of an initiative to improve the reporting of science). It will need revision to be appropriate for the changing aspects of data literacy demanded by increasing use of digital technologies, and the RSS is unlikely to be able to fund this from its own resources. Material on how to communicate on risk and other statistical issues is being produced by the Winton Centre for Risk and Evidence Communication[9].

11. Several organisations are active in promoting and providing training. The role of the RSS has already been mentioned. The Science Media Centre's principal role is to provide routes for scientists to communicate directly to national journalists and hence to improve the quality of science reporting and hence public understanding and engagement, and the scientists involved include statisticians and data scientists. But it also runs occasional sessions to train established journalists, as well as those moving from other areas of reporting into science and health, in aspects of data in science, and puts individual journalists in touch with statisticians for discussions on specific issues. Several UK-based organisations, including the Centre for Investigative Journalism (CIJ)[10], the Association of British Science Writers[11], and STEMPRA[12], an organisation for press officers working in science and technology, have included some training in data literacy, particularly in relation to science and health, in their annual training days and summer schools, and the CIJ summer school has for a few years included a major thread on data journalism. And there is some good online material available (often freely) from various sources.

12. However, most of the journalists who attend these events are, or wish to become, specialists in limited areas – science, health, data journalism, science PR. Data numeracy is still not getting across widely enough to generalist journalists, who will increasingly be expected to report on stories involving data. What is needed, we feel, is a stronger incentive to get trainee and working journalists to engage with relevant training opportunities. Some evidence that incentives work, on a small scale at least, is provided by the experience with the RSS's annual Awards for Statistical Excellence in Journalism, introduced in 2007. Initially most of the entries for these awards were from journalists who already specialised in using statistics, but over the years the range of entries has widened considerably the include a much bigger range of journalists and media outlets.

13. The NCTJ should take a lead in making data literacy an accepted part of every journalist's portfolio of skills, and universities running journalism courses, undergraduate or postgraduate, should all include elements of data literacy and data journalism in their curricula. We suggest that consideration should be given to providing some seedcorn funding from public sources. This approach has had some success in improving the provision of teaching of data literacy and statistics in social sciences in English universities, through the Q-Step

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8 https://www.statslife.org.uk/resources/for-journalists
9 https://wintoncentre.maths.cam.ac.uk/resources/resources-journalists/
10 https://tcij.org/
11 https://www.absw.org.uk/
12 https://stempra.org.uk/

programme[13]. This received considerable funding from public sources (the Economic and Social Research Council (ESRC), and initially the Higher Education Funding Council for England (HEFCE)), as well as from the Nuffield Foundation, and has clearly had considerable impact in increasing the quantity and quality of quantitative education for social science student, though it is slightly too early to make an overall assessment of its success, since it is still in progress (2013 to 2021). The position on journalism education is considerably different from that in the social sciences, but arguably the need for change is even greater.

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13 https://www.nuffieldfoundation.org/students-teachers/q-step