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**House of Lords Communications and Digital Select Committee inquiry:
The future of news: impartiality, trust and technology**

The Ongoing and Upcoming Challenges for the Role of News in Science Communication

Please note that the case study discussed in this statement represents part of a 12-week open educational resource package on evidence-based practice (Evans, 2024).

The recent COVID pandemic has clearly demonstrated the importance of science communication and the critical role the news can play in informing and directing public actions when representing the work of scientists and researchers (Cheung et al., 2023). News media play a critical role in the provision of information to guide the public's decision-making and are therefore typically expected to have a responsibility to promote positive societal outcomes (e.g., those highlighted by sustainable development goals). Furthermore, they have a vested interest in working with the research sector to accurately promote and disseminate the work of scientists and research, to maintain this reputation as a trusted source.

Responsible dissemination of scientific research requires critical evaluation of the research in context of the wider body of evidence. As such, the news media require a competent and critical grasp of foundational skills in the identification, evaluation, synthesis and dissemination of evidence to ensure they accurately portray and represent the research being conducted. These are skills in critical reading and critical writing that are developed over time with training and experience, and thus are unable to be accurately replicated by generative AI. An increase in AI to generate low quality news content or 'clickbait' risks further undermining public trust in the media, with subsequent consequences for the perceived importance of evidence and experts. An example of news dissemination of research is now presented to highlight the importance of quality journalism underpinned by engaging in competent, critical, and contextualised reflection of sources, and greater collaboration between researchers and journalists.

A brief case study in the communication of research in mental health

The following media articles include titles that report the claim that consumption of marmite is a potential intervention for negative mental health, specifically anxiety.

- The Daily Mail: <https://www.dailymail.co.uk/health/article-11027183/Anxious-Try-eating-marmite-High-vitamin-B-levels-ward-bad-thoughts-study-claims.html> (19th July, 2022)

- The Huffington Post: https://www.huffingtonpost.co.uk/entry/marmite-could-help-quell-anxiety-vitamin-b6_uk_62d66e0de4b0116f21bfec45 (19th July, 2022)
- BBC: <https://www.sciencefocus.com/news/eating-marmite-could-help-to-ease-anxiety-and-depression> (20th July, 2022)
- The Independent: <https://www.independent.co.uk/life-style/health-and-families/marmite-lower-stress-anxiety-study-b2126276.html> (19th July, 2022)

All of these articles report on the results of a paper by Dr Field:

- Field, D. T., Cracknell, R. O., Eastwood, J. R., Scarfe, P., Williams, C. M., Zheng, Y., & Tavassoli, T. (2022). High-dose Vitamin B6 supplementation reduces anxiety and strengthens visual surround suppression. *Human Psychopharmacology: Clinical and Experimental*, 37(6), e2852.

To provide a simple overview of the work itself, Dr Field’s work compared the outcomes from 88 students consuming a B6 tablet (100mg of pyroxidine hydrochloride) with 87 students consuming a placebo (lactose) tablet. The researchers used a 44-item anxiety scale to assess anxiety before and after the intervention (pre-post design). The results suggest that both groups decreased in anxiety, the B6 group more so than the control group, however that the interaction between time (pre vs post) and intervention (B6 vs control) was not statistically significant. Peripheral to the core claims reported by the media, this work also examined the results of a group of students taking a B12 tablet (1000µg of methylcobalmin) which reported similar but less strong effects. A range of other outcomes are also captured, beyond the scope of our discussion here.

In the press release of this work (<https://www.reading.ac.uk/news/2022/Research-News/Vitamin-B6-could-reduce-anxiety-and-depression>) there was one reference to marmite and other research carried out on this, but a clear statement that the “high doses used in this trial suggests that supplements would be necessary”. Despite this, all media entries noted above pursued a focus on consumption of the marmite product within the title.

To look at the potential application of media claims surrounding marmite as an effective B6 intervention, the following comparisons of B6 content may be of interest:

Product	mg of B6	Equivalent to B6 supplement intervention
B6 tablet	1 tablet = 100mg of B6	-
Banana	100g banana = 0.4mg of B6	250 (average sized) bananas
Tuna	100g of tuna = 1mg of B6	10000g of tuna (69 cans of tuna, based on average tuna can weight)

Multivitamin tablet (Berocca)	1 berocca = 8.22mg of B6	~12 berocca tablets
Marmite	100g of marmite = 0.57mg (Smith et al., 2017)	17600g of marmite (~70 jars of marmite)

The extent to which these articles acknowledge the use of supplements, and prioritise discussions surrounding dosage, or equivalent dosage in consumption of produce or products, varies. A lack of consideration for the core findings' relevance to inform practice could cause potentially dangerous implications for health.

Given that marmite is high in salt (10.8g per 100g of marmite; Marmite, 2022), and that 1g of salt per kilogram of body weight can lead to sodium poisoning (Strazzullo & Leclercq, 2014), the dosage of marmite is likely to be of greater concern for physical health (via sodium) than likely to improve mental health (via B6). B6 is a valid line of research inquiry, but the evidence-base is not yet appropriate for informing policy or practice (IJzerman et al., 2020), and this would require a set of trained skills to reflect this carefully.

The study in question could also be critically presented on several bases, including an under-powered research design (small sample size), inadequate conflict of interest statement (lack of recognition of B6 tablet provider "donating" the tablets for use), and lack of openly available data to verify claims. All would be valid reasons to doubt the impact of the claims, and so whilst the purpose of this discussion is not to critique the scientific work conducted, the clear limitations of the work did not prevent wide dissemination, and this therefore further highlights the uncritical and therefore irresponsible way in which it has been disseminated.

From the point of the universities' press release of the work, there has been a dangerous extension of claims presented to the public. Claims about the potential of supplements has been extended to product consumption, and in doing so has distorted the evidence to the point at which it cannot be considered helpful or accurate.

Conclusions for Impartiality, Trust and Technology

Impartiality: Mental health is an important societal issue, and the distortion of important scientific developments in our understanding of potential supporting mechanisms (like B6) into invalid, misleading and simplistic interventions (e.g., marmite consumption) is dangerous for undermining a) the recognition of mental health as an important domain, and b) the importance of fully-resourced, evidence-based interventions. This can lead to further societal divides in prioritisation of mental health and have a disproportionately negative impact upon a vulnerable community within our society (e.g., in this case, individuals with poor mental health). The case above study provides just a single example of how the news media can undermine an important societal group and goal through their choice to disseminate scientific research with insufficient criticality.

Trust: Article titles focusing upon marmite rather than B6 is a prioritisation of engagement over accuracy. Increasing use of academic work to generate 'clickbait' undermines the role of research and evidence in our society, causing further societal strain, but also compromises the media organisations responsibility to produce reliable and trustworthy information to guide the public's action. In a busy online space, the media have a reputation which secures them a privileged position within this dynamic arena, and as such they risk this trust and credibility when not engaging in competent, critical, and contextualised reflection of their sources.

Technology: Whilst AI may be capable of extracting and synthesising core information, it is not capable of drawing nuanced arguments from an informed critical appraisal. For example, being able to critically interpret whether a sample size is adequate to make the strength of claims reported. As such, whilst it may lead to less extensions of research (like the stretch from B6 tablets to marmite), it may be considered more problematic in confidently yet uncritically repeating claims without their context (e.g., taking B6 as a robust intervention for anxiety). As such, generative AI can have a role within the future of news, but can only be considered responsible when used by trained and experienced journalists who can provide critical reporting of the fundamentally messy, subjective and complex state of the evidence.

In summary, this case study of scientific reporting reiterates the importance of journalistic standards for critical and transparent reporting of research. It highlights ongoing challenges surrounding the criticality and quality of scientific journalism and its implications for trust in news, the wider role of research, and societal progress. It also raises further questions surrounding the potential for AI-driven news and increasing societal (and thus media) fractioning to exacerbate these. To tackle ongoing and upcoming challenges, we require more collaboration between journalists and researchers, working together to establish the story from the evidence, and transparent use of AI when adopted to facilitate but not replace quality critical journalism on scientific research.

References

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