



## Commentary

## A Call to Think Broadly about Information Literacy



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Pizzagate. Hired protesters at campaign rallies. Massive voter fraud. The Bowling Green Massacre. These are just a few of the many instances of misinformation that went viral during or soon after the 2016 US Presidential campaign and election. Misinformation, urban myths, and conspiracy theories have always existed, but Lewandowsky et al. (2017) make a compelling argument that our world has changed, offering a distressing assessment of the increasing proliferation of misinformation and so-called fake news. As cognitive psychologists, we feel somewhat ill-equipped to comment on this problem, given that the “post-truth” landscape is molded by complex and dynamic socio-political trends, which stand in stark contrast to the controlled laboratory conditions we prefer. Rather than a series of isolated falsehoods, we are confronted with a growing ecosystem of misinformation, involving “an alternative epistemology that does not conform to conventional standards of evidentiary support” (p. 353). What advice, then, might our field of cognitive psychology have to offer?

We agree with the eight interrelated suggestions offered by Lewandowsky et al. (2017) to attenuate the post-truth problem, as well as the potential for technocognition to ease implementation. Of the eight, the majority relate to the skill of assessing the credibility of sources, such as the suggestions to offload evaluation to international non-governmental organizations (NGOs), newspaper editors, or computer algorithms; to disclose affiliations and conflicts; and to train students to recognize trustworthy sources. We would like to see the list expanded with recommendations mapped to the many other skills required to be information literate. That is, learning to evaluate the credibility of sources is only one of many recommendations from the Association of College and Research Libraries (ACRL) for information literacy (American Library Association, 2016).

While supports for source evaluation may be the closest to actualization (both by people and machine algorithms), basic cognitive research makes clear that evaluating sources, while important, will be an incomplete solution. After reviewing some of the basic research on source memory, we offer an example of how another critical skill—evaluating arguments—might be unpacked to yield practical recommendations for scaffolding and training.

A narrow focus on source evaluation skills is problematic because *typical cues for credibility have been hijacked, making source evaluation increasingly difficult*. Consider the rise of *native advertisements*, which resemble a publication’s typical content, format, and style, but are paid placements by advertisers (Conill, 2016; Wojdowski, 2016). In one study, middle school students classified items on a news organization’s home page as advertisements or news. The majority correctly identified a traditional banner ad as advertising, but 80% failed when a news story was labeled as “sponsored content” (Stanford History Education Group, 2016). Similarly, fewer than 10% of adults reported having seen advertising on a recently viewed web page, even though they had read a piece explicitly labeled as an “advertisement” or “sponsored content” (Wojdowski and Evans, 2016). However, simply teaching the definition of “sponsored content” or providing instructions to look for such labels is not enough, given that the camouflage for falsehoods is continually changing and increasingly challenging to spot.

Thus, any solution revolving around source evaluation is part of an “arms race,” with cues to credibility losing effectiveness as increasingly sophisticated approaches blur the line between what is credible versus less credible. A nonproliferation agreement would be ideal, akin to Lewandowsky et al.’s

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(2017) second recommendation for a pact for conduct, but this seems currently unenforceable, with too many parties to bring to the table. For example, consider websites that obfuscate their sponsor (breaking recommendation four) by mimicking the trappings of nonprofits and other more trusted sites. The website *MinimumWage.com* has been criticized on these grounds: the domain name makes it easy to find, and the site contains news stories, quotes from academics at top institutions, and graphics illustrating various claims about the economy. But it is in fact funded by a fiscally conservative think tank, suggesting a partisan bias in content, and questions have been raised about its funding and association to a public relations firm (Lipton, 2014). It could be argued that the site fulfills the requirement to release its sponsor, as it is clearly attributed to the research nonprofit Employment Policies Institute (EPI), but one must then dig further to figure out what EPI is and what the criticisms of it are.

This brings us to the second reason for broadening our focus beyond source evaluation: *there are many cues to truth, and source cues are more affected by the passage of time than other cues*. We ask the reader to stop and think about unauthorized immigration to the US: Has the flow of immigrants increased, decreased, or remained stable over the past few years? What facts is this opinion based on? And, most critically, do you know where those facts came from? A response such as “TV” is too vague, as some programs are more reliable than others. “Probably NPR?” is also not sufficient. You may make assumptions based on where you normally learn information, but that does not guarantee accuracy; we are all continuously exposed to information from a flurry of other sources, including other people, billboards, the radio, press coverage of politicians we disagree with, and so on. If the reader continues this exercise, we predict you will soon realize that you simply believe (or just “know”) many of the things taken as truth, and you do not remember the origin of most information (Tulving, 1985), matching experimental findings demonstrating that source information is lost over time and with repeated exposure (Conway et al., 1997; Watkins and Kerkar, 1985).

Reflecting a cognitively efficient system, and perhaps in part because of the relative unavailability of source information, people often rely on heuristics when judging whether something is true. For example, people interpret easy processing as evidence of truth, with the result that they put more stock in rhyming sayings (e.g., *What sobriety conceals, alcohol reveals*) than non-rhyming ones (e.g., *What sobriety conceals, alcohol unmasks*; McGlone and Tofiqbakhsh, 2000) and rate statements in easy-to-read fonts as truer (e.g., **Osnoro is the capital of Argentina**) than ones in a hard-to-read font (e.g., *Osnoro is the capital of Argentina*; Reber and Schwarz, 1999). Dozens of studies document an *illusory truth effect* whereby repeated statements are judged truer than new ones, as prior exposure makes them easier to read and understand (see Dechene et al., 2010 for a review). In other words, the simple repetition of lies or misinformation (e.g., that Obama wiretapped the Trump campaign) has the potential to make them seem truer. Of course, such feelings of fluency may be discounted, as when one remembers information as coming from a low credibility source (Unkelbach and Stahl, 2009), but this

solution necessarily requires remembering where that information came from (Underwood and Pezdek, 1998). In other words, misinformation may have its impact later, when one is no longer looking at NGO ratings or website badges, and a claim simply comes to mind, unaccompanied by source.

Returning to the bigger picture, we believe the suggestion to train information literacy “so students learn which information to trust, particularly online” (Lewandowsky et al., 2017, p. 353) is critical and must be unpacked, as source evaluation is just one facet of being a literate consumer of information. Our recommendation is to begin by generating a list of the skills required to be a critical consumer of information, in order to map them onto specific suggestions for developing supports and future research. While we are by no means experts in the literatures on social psychology or information literacy, it appears that the list of skills must include, but is not limited to, finding and evaluating information (and deciding how to weigh different parts), being able to set aside one’s preconceived notions (i.e., avoid confirmation bias), recognizing common traps in arguments (e.g., false consensus), accepting that information changes in the face of new evidence, and of course, evaluating the credibility of sources. Reviewing the entirety of this work is beyond the present scope, so we focus on one specific skill—recognizing weak arguments—that we believe researchers should pursue, mapping it onto an example of a specific recommendation.

Someone who is information literate should be able to recognize weak arguments and discount them when evaluating the larger pool of evidence, regardless of how credible the source appears. Lewandowsky et al. (2017) highlight a recent study that suggests it might be possible to train people to do precisely this. *Inoculation theory* refers to the idea that exposure to a weakened version of misinformation can “inoculate” consumers from the stronger version. Of course, this idea is practical only to the extent inoculation is possible against types of arguments rather than specific pieces of misinformation, as it would be impossible to successfully anticipate all misinformation before it appears—who could have foreseen the accusation that Ted Cruz’s father murdered JFK? In a recent study, Cook et al. (2017) taught participants about a common rhetorical technique used to instill doubt about scientific consensus, with the goal of inoculating people against claims that climate change is still being debated. Critically, the inoculation did not focus on climate change other than to point to the similarity in arguments. Participants read about how the tobacco industry in the 1970s used “fake experts”—people with no scientific background, or doctors and scientists with beliefs unrepresentative of the rest of the scientific community—to create the illusion of an ongoing debate about smoking’s negative health consequences. Participants who read about the “fake experts” type of argument were less affected when later reading a passage on climate change that quoted a scientist who referred to “climate change. . . [as] still hotly debated among scientists.” More generally, inoculation has a consistent effect across studies, and there is some evidence for generalization to novel arguments (Banas and Rains, 2010).

Cook et al.'s (2017) study, described above, raises the question of whether there are enough common argument strategies that can be anticipated and taught, and as Lewandowsky et al. (2017) note, the extent to which such effects “generalize across content domains” (p. 353). However, in addition to transfer across arguments and issues, our final point is to urge stakeholders to think broadly about the diversity of situations in which these skills will be needed. We should not forget about informal settings (e.g., Facebook, blogs, comedy sketches, water cooler conversations) which are increasingly where many of us read, hear, and watch news and information about the world. Much work in the realm of teaching students and adults to be responsible consumers of information assumes an academic setting (e.g., completing a research paper). And extant work into people's ability to catch errors and misinformation is not promising: people's performance is quite poor even when they are sitting in a research laboratory being explicitly warned to look out for misleading information (Cantor and Marsh, 2016; Fazio et al., 2015). People may be even more credulous in the actual situations they are getting their news, whether that is scrolling through Twitter, clicking on articles shared on Facebook, conversing with friends and family, or listening to the radio or podcasts while driving. Even if we see evidence of successful information literacy in a laboratory or classroom setting, an effective solution must also take into account informal learning environments in which people may be less likely to spontaneously engage critical thinking skills.

It is within these non-academic settings in which Lewandowsky et al.'s suggestions for technocognition—a marriage of solutions based in technology and grounded in psychological principles—may be particularly useful. Many of the ideas currently listed involve harnessing technocognition to peel away the layers of source information to objectively assess credibility. We have already commented that such an approach will be insufficient, especially because information about source will degrade over time. Of course, it would be much more effective were technology used to block access to information from low credibility sources, but censorship is problematic for many reasons, and people are not so eager to have their private spaces manipulated (see public reaction to Kramer et al., 2014). However, if technocognition could be used to evaluate sources, might it also be used evaluate arguments? For instance, could content in a news story be analyzed to identify weak arguments, which would be labeled before (or during) exposure to the content: “The following article may contain *cherry-picking*”; Lewandowsky et al., 2016)? We believe this use of technology holds promise, given that platforms such as Facebook and Twitter deliver much of people's informal information and news consumption.

In sum, the problems and solutions posed by Lewandowsky et al. are timely considerations for everyone, but they are of particular importance and interest to those doing research in the cognitive sciences. We agree with what Lewandowsky et al.'s message broadly, and want to highlight the important role information literacy can play moving forward. We applaud the specificity of the suggestions to promote source evaluation, and encourage development of similarly specific strategies

to support other critical processes involved in information literacy.

### Author Contributions

EJM and BWY developed the arguments together and co-wrote the article.

### Conflict of Interest Statement

The author declares no conflict of interest.

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