

A Verification Vaccine for Social Contagion

As a class, social media technologies (i.e., Facebook and Twitter) are large-scale information cascades which approximately 47% of American adults utilize as their main source of information. However, as any millennial will lament, particularly the ones engaged as science communicators, just because it is on the internet, doesn't make it true. Vosoughi *et al.* (2016) demonstrated that false news reached more people than the truth; the top 1% of false news cascades diffused to between 1,000 and 100,000 people, while the truth rarely diffused to more than 1,000 people. And the specific diffusion of false science news was farther, faster, deeper, and wider than the evidence-based science news. The best example of this is the public's familiarity with, and awareness of, autism spectrum disorder (hereafter autism). Since the first diagnosis 74 years ago, the public's ability to discern factual breakthroughs from hyperbolic headlines has become increasingly challenging. The prevalence of misinformation on autism leads to the propagation of incorrect theories, such as a causal relationship between vaccines and autism diagnoses. Scientists are then tasked with creating, propagating, and upholding evidence-based breakthroughs, as well as the active opposition of misinformation. This results in public and private funding being misspent to recapitulate findings biomedical researchers have proven to be fact and impeding progress towards elucidating fundamental biology. Scientist must be tenacious in the education of the public on facts, but the public must be able to clearly discern who and what information to trust.

Within social media (i.e. Twitter and Facebook) currently, the most widely used system of verification system is colloquially referred to as the "blue checkmark". As the moniker suggests, a blue checkmark badge (Figure 1A) appears adjacent to the account handle or username once an account is verified or "authenticated"¹. Verification confers the account is of public interest, with account owners that are typically "users in music, acting, fashion, government, politics, religion, journalism, media, sports, business," and other high-profile sectors. The field of science is characteristically missing from that list. Yet, for example, the Twitter account of Jenny McCarthy, a popular television personality and anti-vaccination activist, carries a blue checkmark badge indicating the account is authentic and is knowingly monitored by McCarthy. In contrast, the account of Dr. Simon Baron-Cohen, a renowned researcher who has authored

over 300 evidenced-based autism articles, is not similarly authenticated. Moreover, as verification application materials, which include items such as a confirmed email address, birthdate, and public record of engagement², suggest that verification, more specifically relates authenticity rather than expertise or credibility. Therefore, to build trust in the science and research enterprise, authenticated users should be able to simultaneously demonstrate the credibility of the shared information.

Trust encompasses both the reproducibility of expectation and the transparency in the unbiased motivations and influences operating on science research. Counterintuitively, this is best achieved by blockchains, the immutable (commonly) trustless ledgers. If a user authenticated by their verified scientific expertise consistently shared information with a traceable path there would be no question as to its veracity, credibility, or continued factual integrity. Fact-checking data sourced from social media is an Odysseyan task, involving multiple websites and the ability to override paywalls to non-open-access scholarly articles. However, there would be less of a need for fact-checking if the information was sourced from a previously authenticated source. A scientific verification badge would indicate expertise and allow for evidence-based science news and discoveries to be easily diffused. The badge would (for example, Figure 1B) indicate a complex metric of scientific fitness (i.e., h-index). For autism research, this system would separate celebrity personalities like Ms. McCarthy from experts like Dr. Baron-Cohen, assisting the public to acquire a discernable eye for misinformation from unauthenticated users. Like vaccines, which effectively fight and eradicate infectious disease, a scientific verification badge would strengthen the trust in the bearers as well confidently share content.



Figure 1. (A) Image of Twitter verification badge. (B) Proposed scientific verification badge.

1. About verified accounts [Internet]. Twitter Help Center. [cited 2017 Apr 3]. Available from: <https://help.twitter.com/articles/119135?lang=en>

2. Request to verify an account [Internet]. Twitter Help Center. [cited 2017 Apr 3]. Available from: <https://help.twitter.com/articles/20174631?lang=en>