

Improving the accuracy of science portrayal in the media



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Science communication is important in bridging the gap between scientists and the general public in knowledge and understanding about how scientific issues and phenomena affects society and our way of life. This is important to increase the scientific literacy of the general public so that they are able to make informed decisions which affect not just themselves but also on issues that have implications on society. While the use of non-academic or scientific channels to communicate science is not a new concept, the prevalence of the mass media in today's information-rich environment has drastically changed the communication landscape with many more types and number of platforms available, offering numerous opportunities for the scientific community to reach out to the layman. As the general public obtains information regarding science topics often from available media sources (Gardner, 2008), the ever-growing expanse of this modern media landscape has undoubtedly shaped the way science is consumed and viewed by the public. Unfortunately, the use of mass media to communicate science has also led to the spread of "pseudo-science"[1] and biases based on the creative agenda of popular (or "pop") culture content generators such as movie producers, journalists, bloggers or the casual YouTube video-maker. This not only poses a problem to general scientific literacy; the increasingly rampant spread of misinformation and "fake science" has also threatened to undo the positive effects of science communication with real consequence to the public discourse on scientific issues. This essay attempts to reflect on the prevailing portrayal of science in the media and popular culture, taking reference from examples in common media platforms today (e. g. movies, TV, social media). The paper will also suggest some measures that content

publishers and the public can take to improve the accuracy of science communication.

Influence of the media on general public's understanding of science

Science and the movies have been intertwined from the beginning of cinema (Kirby, 2014). Science fiction movies such as Star Trek, Star Wars and Jurassic Park franchises were not only hugely successful in the box office, they have also ingrained themselves into the imagination and psyche of generations of moviegoers. These hugely influential movies not only inspire imaginations of “ what ifs”, they also brought scientific topics such as space travel, existence of extra-terrestrial beings and biology and ecology to the general public, albeit with a healthy dose of sensationalism and drama for purposes of entertainment. As Kirby (2008) noted, scholars have begun to recognize the importance of the cinema in the public's understanding of science. The popularity of science fiction meant that films (as a proxy for the mass media in general) continue to be a useful platform for science communication and shaping public discourse on science and technology, helping the public to interpret new scientific breakthroughs and discoveries or simply to frame the use of science and technology in the world that we live in. Beyond the screens, digital technologies such as YouTube and social media platforms like Facebook have also become hugely popular with the internet now firmly embedded into our everyday lives. These online platforms transcend traditional constraints of distribution of information to not only broaden the reach of information but also accelerate the pace at which such information can be made available to large groups of people.

Such media platforms, usually un-policed and lack proper quality or editorial

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control, have often become the most available source for the public to gain information about scientific discoveries, controversies, events and the work of scientists outside of formal education. In fact, studies have shown that the public learns a large amount of science through consuming mass media news (Wilson, 1995). It is hence important to understand the prevalent portrayal of science and scientists in the media, so as to gain an understanding of the potential impact such portrayal has on the public's opinion of the scientific community and its work.

Portrayal of science in media and popular culture

Gerbner (1987) asserts that television entertainment programming encourages hostile public perceptions of science. Science and technology are often depicted as causing harm to mother nature, dehumanizing mankind, or simply threatening the existence of the planet. Doomsday apocalyptic scenarios such as worldwide nuclear fall-out (e. g. in the movie *Deterrence*) or genetically-modified beings causing uncontrolled destruction to civilisations (e. g. *X-men*) are common themes portrayed in modern cinema. While scientific advancements such as space exploration and nuclear power had given hope of a better future, naysayers had also used it to raise concerns of the potential for science to be manipulated or doubt its actual benefits by playing up dramatized scenes from films. Even amongst supposedly well-educated and well-informed demographic of 25-to-40-year-olds in the U. S., Gerbner's research found that there is an apprehension about the benefits of science vis-à-vis the risks to our way of life. Long & Steinke (1996) found that science in general is often depicted as mysterious, magical, or dangerous; many depictions of scientists show them as eccentric

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and anti-social. Science and scientists are also commonly portrayed as easily manipulated by government or big corporations for selfish gains. Such depictions have unfairly taken root in mainstream consciousness, and can diminish the credibility of actual scientists and their important work. Inevitably, this results in anxieties amongst the general public about unrestrained science and technology.

Furthermore, television programs have also introduced alternative science, or pseudo-science, into the pop culture. The popular television series “ The X-Files”, for example, often depict paranormal activities as normal and suggests that traditional science is incapable of solving “ real-life” problems. Shows like “ The X-files” depict science as failing and as incapable of offering satisfactory scientific explanations for extraordinary occurrences, as well as depicting rational and scientific efforts as subordinate to mystical speculation. Its “ quasi-documentary” style and a false-appropriation of authority (both main characters are FBI agents in the show) suggest to unwitting viewers that the cases portrayed are “ real”. While most viewers do not believe the TV series to be as factual as a documentary, many fans were found to believe that the cases were plausible. Producers of such shows would contend that sensationalistic, inaccurate, and negative portrayals of science are inevitable and that they are merely part of the nature of popular fiction (Nisbet et al., 2002), and evidence mounts that viewers’ conceptions of reality are influenced by media entertainment programming (Evans, 1996). This example illustrates how what we see in the media can lead to blurring of the lines between science and pseudo-science, which leads to the erosion of scientists’ credibility and public’s trust in science, while lending

credence to conspiracy themes like the government covering-up the “ truth” and keeping ordinary citizens in the dark. For the sake of entertainment, scientific accuracy will always take a backseat to storytelling (Kirby, 2008); the emphasis is often not on producing content that accurately portrays science, but rather to produce creative content that is entertaining and related to science.

Apart from the movies and television, biased and sensationalistic reporting in the news has also contributed to the spread of mis-information and misrepresentation of science. Media coverage have the tendency to concentrate too much on trendy discoveries rather than the details of research and development, often exaggerating risks and unduly alarming the public (Hartz & Chappell, 1997). In the interest of meeting the fast-paced digital news cycle, diligent reporters find themselves with less time to investigate a story fully before publishing. This creates an avenue for misrepresentation of facts or proliferation of false information, or simply misleading content for the sake of sensationalism to beat the competition. For example, an article on male sheep neuroendocrinology was headlined “ Brokeback mutton” by the Washington Post (Feb 4, 2007) suggests that even the most reputable of media outlets are not immune to sacrificing strict validity for “ clicks” or “ sales”, and it is increasingly difficult for scientists to publish articles and journals to compete for the mind-space of the public against such flashier “ news”. Even when misleading or factually inaccurate information is published, scientists found that the act of attempting to correct misinformation can reinforce the public’s awareness of the existence of such falsehoods or misrepresented facts.

It is from the backdrop of such negative and “adversarial” environment against science that conspiracy theories and beliefs began to gain popularity. Conspiracy beliefs stem to a large extent from epistemic, existential and social motives; mostly from groups and individuals who are already alienated from society and for whom conspiracy theories may offer some compensation and a source of belonging (Douglas et al., 2017). Conspiracy theories continue to have such strong appeal as they are able to help the layman make sense of events or issues that they do not understand or feel that they lack control over. The problem is further compounded by social media and online platforms’ use of personalized algorithms to track and amplify user browsing patterns; conspiracy theories usually spread when the algorithms continually feed users content consistent with their own beliefs and surfing patterns, thereby completing a self-fulfilling cycle and strengthening the acceptance of one’s own pre-conceived notions. A quick internet search will uncover numerous discussion on “mis-information campaigns” and “fake news”, such as anti-vaccination movement, fear-mongering about artificial intelligence and the rise of killer robots, as well as climate change denials. The next sections will attempt to provide more detailed look at recent examples of contestation between science and misinformation, how they have become entrenched in the public discourse, and its effects on policy and society.

Misinformation in understanding climate change

Perhaps one of the most well-known examples of the negative consequences of lack of trust in science and spread of misinformation is the issue of climate change, where the breakdown in transmission of fundamental climate data <https://assignbuster.com/improving-the-accuracy-of-science-portrayal-in-the-media/>

to the general public, amongst other factors, has contributed to widespread mistrust and misunderstanding of the science behind climate change (Somerville & Hassol, 2011). Somerville & Hassol (2011) further highlighted the well-organised and well-funded disinformation campaign, ranging from ideological to financial motivations, that has been waged against climate science for decades. The public and political debate surrounding climate change is known to be heavily influenced and often biased and distorted when it comes to the “ scientific facts” of climate change, with the science base for climate change and climate experts attacked by various counter-experts in order to manufacture doubt on the evidence base (Allgaier, 2019). The portrayal of a lack of consensus within the scientific community of the facts made it difficult for the public to discern the information that is commonly available such that they are able to reach informed decisions. This provides opportunities for various actors that either deny climate change or peddle conspiracy theories to continue to distort the facts and shape discourse. As part of his research, Allgaier (2019) analysed the content of randomised sample of 200 YouTube videos related to climate change, and found more than half of the videos either denied that climate change was due to man-made causes or claimed that climate change as a whole was a conspiracy. With no fact-checking or policing of the content in the videos, such misinformation will continue to proliferate amongst believers and further muddy the already murky waters that is the public’s understanding of climate science. As the mandate for governments to take policy actions come from the people, a lack of common understanding would then affect the ability of governments to take effective decisions to curtail the effects of climate change. Global efforts to combat climate change are also not helped <https://assignbuster.com/improving-the-accuracy-of-science-portrayal-in-the-media/>

by governments that seemed to discredit climate science in the interest of nationalistic policies; Friedman (2019) noted that U. S. President Donald Trump has mocked climate science as a hoax, and formally announced its intentions to withdraw from the Paris Climate Accord which he had claimed to have impose intolerable burdens on the American economy.

Proliferation of anti-vaccination fears

Climate change is not the only area where we see at trend for misrepresentation of science having the upper hand over scientific facts. The safety and benefits of vaccinations have also become a victim of widely-spread conspiracy theories, leading to the rise of anti-vaccination sentiments (or anti-vaxxers). While some anti-vaxxers openly deny the benefits of vaccination to public health, it is much more common to cite conspiracy theories and concerns about safety of vaccines. The most well-known example is the measles-mumps-rubella (MMR) vaccine and autism.

Discredited ex-physician Andrew Wakefield published a paper in the medical journal *The Lancet* in 1998, Wakefield claimed a link between MMR vaccine and autism. Since then, researchers were unable to reproduce Wakefield's findings, and most of Wakefield's co-authors withdrew their support for the study's interpretation. While *The Lancet* subsequently retracted Wakefield's paper, and the British Medical Journal described Wakefield's work as a fraud, Wakefield's study led to a drastic decline in vaccination rates in the United States and United Kingdom in a climate of distrust of all vaccines and the emergence of anti-vaccination movements. In recent years, the "anti-vaxxer" movement has flooded social media platforms with various forms of "counter-facts" questioning the safety of mandated vaccination regimes, <https://assignbuster.com/improving-the-accuracy-of-science-portrayal-in-the-media/>

giving the likes of Wakefield a platform and audience to continue to campaign despite losing his medical license for dishonesty and unprofessional conduct in this field of work. Expert consensus alleges that his efforts have contributed to persistent vaccine anxieties and refusals, including a 2017 measles outbreak in Minnesota (Larson, 2018). To further complicate matters, a slew of celebrities[2] had in recent times spoken out publicly against mandatory vaccinations, attempting to highlight risks of vaccinations and contributing to the growing confusion as to the side-effects of vaccination without conducting scientifically accurate studies. Given the combination of growing misinformation, lack of trust in scientists and science, as well as inordinate amount of influence from celebrities, many people have been persuaded to make decisions on their healthcare based on provocative, frightening and often false content that puts their children at risk. The effects of anti-vaccination are far-reaching; it would take several years to regain public confidence in the vaccine, if not already eroded so much that vaccinations are rendered moot. The absence of a vaccination regime would also have created suitable conditions for a global pandemic. UNICEF believes that widening pockets of unvaccinated children have created a pathway to measles outbreaks around the world today.

How to turn the tables on negative portrayals and misinformation

In this section, the essay will attempt to discuss how the scientific community can navigate through and push back against the wave of misinformation. In order to effectively communicate science, scientists must first develop skills to communicate science at a level that a general audience can understand. This requires deliberate practice and careful attention to <https://assignbuster.com/improving-the-accuracy-of-science-portrayal-in-the-media/>

language, such as substitution of jargons for plain language. Somerville & Hassol (2011) also pointed out the importance of framing the science problem (e. g. climate change) into an issue that people care about. In other words, science issues should be framed as an economical and livelihood matter, instead of just basic science issue. This will help connect the general population to the research, bringing out the “ bottom line” up front when communicating to the public, such that the “ so what” that people need to be concerned about will become more apparent. Much has been discussed in literature of the need to develop journalistic skills in scientists, as well as critical viewing or media analysis as essential part of the scientists’ education (Gerbner, 1987, Brownell et al., 2013). While Wikes (2002) warns of the challenges and difficult circumstances in which the “ scientist-journalist” would likely have to work in, scientists with a good understanding of the nature of modern journalism would be more able to bridge the divide between science and the media and work with journalists to ensure accountability and accuracy of media content.

Furthermore, the scientific community can also do more to make evidence-based research more commonly available on the internet. Presently, access to many scientific journals is limited by pay-to-read accounts that one must sign up for with publishers. These paywalls are obstructive and unethical, especially since most research are publicly-funded (Jackson, Mahar, Altosaar, Gaultois, 2019). With open access of publicly-funded scientific research, much like what the European Union aims to achieve by 2020, the public would be able to access legitimate scientific work to increase their scientific literacy. To challenge the spread of falsehoods and misinformation in the

same medium, scientists should continue to speak out against inaccurate information when published, even on social media or online communities like Reddit. Larson (2018) espouses targeted social media campaigns to combat misinformation in the same realm, which had demonstrated results in countries like Denmark and Ireland.

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[1]Pseudo-science is defined as claims presented so that they appear to be scientific even though they lack supporting evidence and plausibility (Shermer, 1997). This includes beliefs, theories, or practices that have been or are considered scientific, but have no basis in scientific fact.

[2]Celebrities who have publicly spoken against vaccination include Jessica Biel, Jim Carrey and Jenny McCarthy.