**Reducing the Rampant Spread of Misinformation and Disinformation**

**Abstract**

Within the last couple of years, Earth has been plagued by the COVID-19 pandemic, with the United States being hit especially hard, with a total of over 48 million reported cases[[1]](#footnote-0). It has proven difficult to manage the pandemic, and solutions are being searched for by many. However, one such tool that allowed COVID-19 to flourish is misinformation and disinformation. While misinformation and disinformation differ with the intention of the person spreading the information, with disinformation involving malicious and purposeful intent and misinformation involving mistakenly doing so, their effect on COVID-19’s spread has proven to be equally disastrous. Misinformation and Disinformation have been an issue in the spotlight before, when it was used during the 2016 United States presidential election, as well as during many other important events. It has proven to be a threat, and a threat that will not simply disappear. So, what can we do to reduce the spread of misinformation? In an attempt to answer that question, many studies have been conducted, with varying and valuable results and data. The purpose of this study is to examine possible solutions to reducing misinformation and disinformation, while also gaining an understanding of why they have managed to become such an issue, by analysing . By looking at these, we may gain an idea of effective methods to manage them.

**Introduction**

But how big of an issue is misinformation and disinformation, really? The level of importance it has played, not only in COVID-19’s spread but in the spread of many other conspiracies, political ideals, and other viruses and pandemics, has proven to be large, and rarely beneficial. A CNN article reports that, after a remark made by Trump, misinformation spread throughout Nigeria, resulting in many citizens taking Chloroquine, with three citizens overdosing, in an attempt to stop COVID-19. The drug Chloroquine is originally meant for malaria, lupus, and rheumatoid arthritis. Not only was this information false, but it led to a drastic price increase for the drug[[2]](#footnote-1). Misinformation is also often used to harbor hatred and cruelty. In March of 2020, it was found that nearly 30% of adults in the United States believed that the Chinese government created the COVID-19 virus, leading to an outbreak in anger and resentment towards people of Asian ethnicity[[3]](#footnote-2). In December of 2016, a shooting occurred (fortunately, with no one being hurt), as a result of a piece of disinformation that tied a local shop to a pedophile sex ring involving certain political candidates[[4]](#footnote-3). While the tweets that made this claim were proven false, the effect they had nearly resulted in the loss of lives. Misinformation and Disinformation can be dangerous, and with the current pandemic, they have run rampant. While always an issue, the influence of misinformation and disinformation grows exceptionally during important events, such as United States presidential elections and pandemics, when false info can be particularly harmful.

**Method**

For this study, I researched attempts and experiments by other groups, in order to analyze the data they collected and results they reached, and investigated case studies that could help peoples’ understanding of misinformation and disinformation. As a result of misinformation and disinformation’s influence, there is no shortage in attempts to stop it. I focused on the methods used in each study, and noted the circumstances and results. I focused on three studies in particular.

Study 1

In their study, Emily K. Vraga and Leticia Bode used a WHO graphic on a Facebook feed, with around 1,500 participants[[5]](#footnote-4). The graphic debunks a commonly repeated myth that a hot bath will significantly raise your body temperature, and thus can help eliminate COVID-19, which is explained to be false. It is important to note that the graphic follows the “Five Cs of Correction”; is consensus based, includes corroborating evidence, is consistent, is coherent, and is credible (Vraga and Bode, 2021). In short, the graphic was made with special attention to the ease of understanding and ease of verification. Vraga and Bode’s study consisted of multiple experiments that tested specific variables, in two waves. The first experiment acted as a control condition. The second experiment focused on preemptive exposure to the corrective material. In this experiment, participants were shown the feed, which included multiple posts, consisting of the WHO graphic and the misinformation graphic. The corrective graphic and the misinformation graphic were kept separate, and the WHO graphic was shown first. The third experiment used the WHO graphic as a responsive piece, with the WHO graphic connected to the misinformation graphic. The next experiment followed a similar path, but the corrective graphic was not posted by the WHO, but instead a random user. Participants were then asked a series of questions, which were then recorded and compared. Each experiment, except for the control condition, was replicated for both Wave One and Wave Two.

Study 2

Jon Agley & Yunyu Xiao’s study used five existing narratives related to COVID-19[[6]](#footnote-5). Their study focused on determining what kind of people were more susceptible to misinformation. They asked their participants, numbering 660 people, how believable each narrative was, what their political and religious background is, and what their trust in science is. Using a point scale, they “scored” each participant based on their answers, and compared the scores for each question (Agley and Xiao, 2021).

Study 3

It is also important to note that the threat of misinformation affects not only the United States. Roozenbeek, Schneider, Dryhurst, Kerr, Freeman, Recchia, van der Bles, and van der Linden conducted an experiment involving a sample group of people from five different nations, consisting of the United Kingdom, the United States, Ireland, Spain, and Mexico[[7]](#footnote-6). There were two groups for the United Kingdom, with the first group having 1050 participants and the second group having 1150 participants (Roozenbeek, Schneider, Dryhurst, Kerr, Freeman, Recchia, van der Bles, and van der Linden, 2020).The groups for the United States, Ireland, Spain, and Mexico each consisted of 700 participants. Each group was balanced on national quotas for age and gender. The intention behind this study was to investigate the susceptibility of people to COVID-19 misinformation, similarly to Agley and Xiao’s study, and also its influence on health-related behaviors. Two United Kingdom groups were used to determine whether the observed effects would remain constant over time. Before the questions related to COVID-19 were given, participants were given a set of questions, such as the Schwartz test, to measure their numeracy level and test their abilities to understand quantitative data and information. Each participant was then asked a set of questions, such as what they had done in preparation for COVID-19 and to what extent they believed in a given statement. The responses were then recorded and compared, both with the people within the group, and with other groups.

**Results**

For this study, the important results are the results of each study I analyzed. Each study provides a different outlook on the issue of misinformation, with many tackling different conditions, or the same conditions in a different way.

Study 1

Vraga and Bode’s study consisted of two waves, with four experiments, each replicated in both waves for a total of eight experiments. Each experiment tested a specific condition, and the use of two waves tested the effect of time on the exposure of the corrective graphic(Vraga and Bode, 2021). Wave 1 consisted of 1543 people, while Wave 2 consisted of 1,110 people. The results of Wave 1 showed success in reducing the misperception that a hot bath would significantly increase body temperature, but it failed to influence the misperception that a hot bath would prevent COVID-19. Throughout Wave 1, however, there was no significant change through each experiment, which tested the placement and source of the corrective graphic. Wave 2 tested the same conditions as Wave 1, but with the added condition of time. The same experiments were conducted as in Wave 1, but it was performed about one week later. The results of Wave 2 showed that the misperception that a hot bath could reduce body temperature was reduced. It was also found that the participants in the responsive correction graphic experiment showed an average of 11% decrease in the misperception that a hot bath could affect COVID-19. However, for the other conditions, there was not a significant enough change to misperceptions. There was also no significant difference based on the source of the graphic, whether it came from the WHO or a random user. Therefore, the overall results were that corrective material was able to lower some misperceptions, but were unable to affect misperceptions related to COVID-19 in a significant manner, regardless of the source.

Study 2

Agley and Xiao’s study focused on which types of people were likely to fall victim to misinformation, rather than methods of preventing it.Their study used five selected COVID-19 narratives and 660 participants (Agley and Xiao, 2021). Each participant was asked about the believability of each narrative. From their results, they found that there were four distinct types of participants. Type 1 believed scientifically accepted narratives, such as zoonotic origin, but not misinformed narratives. This type consisted of approximately 70% of participants. Type 2 through Type 4 still generally believed in scientifically accepted narratives, but also believed in the misinformation narratives, with Type 2 believing in less misinformation, and Type 4 believing in more. It was also found that those that fell into Types 2, 3 and 4 had a lower trust in science. An unexpected result was that believing in scientifically accepted facts did not mean that a participant did not also believe in the false narratives. Less surprising, however, is that those that believed in one false narrative usually had a higher believability score for the other false narratives as well. Below is a model that demonstrates the results of each narrative and their believability (Figure 1).

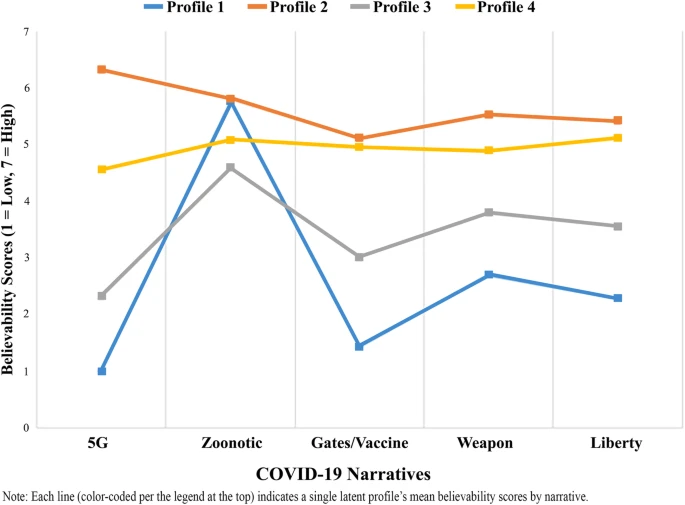


Figure 1: This graph illustrates the believability scores of each COVID-19 related narrative for each Profile type. Note that Profile 1 has the lowest score in each narrative, besides the Zoonotic narrative.

Study 3

Roozenbeek, Schneider, Dryhurst, Kerr, Freeman, Recchia, van der Bles, and van der Linden’s study focused on observing the susceptibility of people to misinformation in multiple different countries. Using groups of participants from five different countries, they recorded their answers to sets of questions related to misinformation related to COVID-19. Some of their results can be seen in the model below (Roozenbeek, Schneider, Dryhurst, Kerr, Freeman, Recchia, van der Bles, and van der Linden, 2020)(Figure 2).

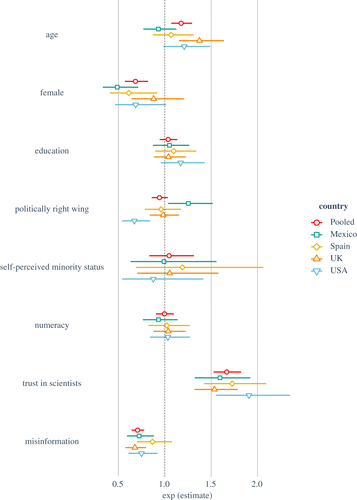


Figure 2: This graph illustrates the aspect of participants, separated by their country, on a scale.

They found that misinformation involving COVID-19 is generally seen as unreliable. However, the most commonly believed, in every country studied, was that COVID-19 was engineered in a lab in Wuhan. About 25-25% of people claimed this piece of misinformation was reliable. It was also found that, in every country, factual statements were generally seen as reliable. However, those that found one fact unreliable tended to find most or all of the facts given unreliable. According to their data, participants that passed the numeracy level questions and had a higher trust in scientists were less likely to be susceptible to misinformation. It was also found, in all but Mexico (where it was in stark reversal), that older age leads to lower susceptibility. In all but the United States and the United Kingdom, those that leaned right-wing or were politically-conservative were more susceptible. In Mexico, Spain, and the United States, those with trust in politicians to handle COVID-19’s threat were more susceptible. Finally, their data showed that people exposed to misinformation through social media were more likely to be susceptible to believing it. An important pattern they noted was that while misinformation susceptibility is relatively low, those that were shown to be more susceptible were consistently susceptible. This shows that while only a small portion of the population are at risk, that small portion is severely at risk.

Much of the results from each of these studies mirrored each other, confirming much of the data and conclusions they had come to, while also providing a new condition or outlook to focus on. By looking at every variable and condition, we can gain a better understanding of misinformation and disinformation as a whole.

**Discussion**

As COVID-19 continues to carry on, discussion about misinformation and disinformation has gained traction, as people become concerned with its reach and consequences. While I do not believe there is any easy solution to completely eradicating it, by better understanding what encourages misinformation to flourish, and what has the opposite result, I believe we can properly reduce misinformation and disinformation to a much less noticeable state. The studies I examined have shown that, while misinformation certainly exists, a large majority of people are able to effectively avoid most serious narratives. The population that tends to fall victim to misinformation fall into the categories of lower education, political naivety, and active on social media. Providing a better education, both on science and politics could serve to reduce susceptibility among many. On a related note, it would be highly beneficial to focus on why people have little trust in science, and how that can be improved and repaired. After all, it is easier to persuade with credible facts when people respect the credible source. Most importantly, and perhaps easier, is to place restrictions or regulations on social media platforms, making it more difficult or discouraging to promote, or even just allow, misinformation posts. One such example would be pushing out corrective information, easy to understand and from a credible source. The corrective information can be attached to narratives of misinformation, or they can be posts of their own, as either has shown to be equally effective, but they need to be consistently shown and pushed into the social media’s algorithms. Individuals can also help by avoiding contact and reactions to misinformation, even if just to refute it. For example, sharing a narrative of misinformation, with the intent to proclaim how ridiculous it is, provides a method for these narratives to spread, regardless of the intention. Many studies have found that a primary reason people believe misinformation is because they see the same misinformation multiple times[[8]](#footnote-7). The more a person sees a piece of information, the more likely they will be to believe it. Instead, simply sharing facts that would disprove claims of misinformation, but not mentioning the misinformation, has proven equally effective in fixing a person’s misperceptions and more effective in preventing the misperception from occuring in the first place. Another effective solution for individuals is to do nothing. A post that receives engagement is pushed to others, but with no engagement, a social media’s platform simply pushes it aside, opting to push other content instead. This leads to the most effective solution in stopping misinformation, which is preventing it from being shared and seen at all. A more serious approach by social media companies, with serious consequences for offenders, and serious effort put in by the social media site’s team, would be necessary in preventing social media from being a misinformation and disinformation hotspot. With the introduction on the world wide web and social media, misinformation and disinformation have the perfect conditions to grow and, regardless of what strategies are used, serious effort from everyone will be needed, to effectively eliminate their spread.

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