

**Examining the Politicization of Science Through Uncertainty in Knowledge, Confirmation
Bias, and Misinformation**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this
assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

“If thought corrupts language, language can also corrupt thought. A bad usage can spread by tradition and imitation even among people who should and do know better.” (Orwell, 2013). Often science is not concerned with morality, it is a tool used to answer questions about the natural world. It is neither good nor bad, with an example being the discovery of fission in 1938. Fission can be controlled using a nuclear reactor to generate electricity. Coincidentally, the chain reaction created by fission was used to create the first atomic bomb (December 1938, n.d.). The knowledge gained from a scientific discovery must be given meaning by society. Unfortunately, after a discovery has been made, it can be exploited to fit certain political agendas. These agendas are often hidden under pretenses. Additionally, scientific findings can be manipulated to support specific ideologies.

This STS research paper will analyze the impact social factors have on science, and how science can be exploited to promote certain political agendas for financial gain, power, and control. This will be achieved through the analysis of eugenics, the link between cancer and tobacco, and the COVID-19 pandemic.

Uncertainty in Knowledge

“How could they see anything but the shadows if they were never allowed to move their heads?” (Plato, 2014).

The World Health Organization states, “Smoking is the leading cause of preventable death. Worldwide, tobacco use causes more than 7 million deaths per year” (Diseases and Death, 2023). It is now widely known that tobacco causes cancer, however, this was not always the case. Lung cancer was rare before the 20th century accounting for nearly 10% of all cancers (Ruegg, 2015). Smoking became more popular during the 1900s due to commercialization. In WWI and

WWII, cigarettes were supplied to soldiers and smoking started to gain more widespread popularity. According to the American Cancer Society, “Per capita cigarette consumption soared from 54 per year in 1900, to 4,345 per year in 1963. And, lung cancer went from rarity to more commonplace – by the early 1950s it became ‘the most common cancer diagnosed in American men’” (The Study That Helped Spur the U.S. Stop-Smoking Movement, n.d.). Before the 1950s there had been various studies drawing a connection between cancer and tobacco, although there was a struggle to give clear evidence proving smoking definitively causes cancer. This all changed in 1953 when the American Cancer Society published a study linking death and cancer to smoking through 188,000 participants (The Study That Helped Spur the U.S. Stop-Smoking Movement, n.d.).

Now with a definitive link between smoking and lung cancer, the tobacco industry had to act. It would be crucial not to deny the American Cancer Society but to cast doubt and uncertainty on the study's conclusions. Through this, the tobacco industry would be able to dispute the connection that smoking leads to cancer. The tobacco industry intentionally confused and cast doubt on prior research through its own funding of scientific discovery, “It would be crucial to identify scientists who expressed skepticism about the link between cigarettes and cancer, those critical of statistical methods, and especially those who had offered alternative hypotheses for the causes of cancer” (Brandt, 2012). This is common today with big industries but at the time this was the first of its kind. It was a revolutionary shift in marketing and politics specifically aimed at undermining scientific findings and public health. Additionally, the media would be used to manipulate the opinions of the general public, “The problem in this formulation was that science was treated as the analog of common political debate and social controversy. At that time, few journalists had any sophisticated scientific education or training” (Brandt, 2012).

The issue with media coverage at the time was that it stressed balance as though there were two sides in the “continuing debate”. They would commonly interview people with little to no expertise to make unfounded claims about the health of smoking to portray the small minority opinion as the majority consensus (Brandt, 2012).

These malicious tactics proved just how malleable knowledge and public discourse can be as the sale of cigarettes grew even after the link between cancer and smoking was found, “The total number of cigarettes sold annually had risen from 369 billion in 1954, the company's first full year of service to the industry, to 488 billion.” (Brandt, 2012). The tobacco industry showed how easy it was to exploit scientific research for financial gain. The very system that makes research possible was shown that it could be manipulated when answers were not certain, “it is striking to note the utter lack of serious and effective regulatory action on the part of the federal government” (Brandt, 2012). Certainty in science is impossible. Uncertainty in knowledge is a necessary part of the scientific process as it gives way to refinement. Additionally, language is a powerful tool in educating the public on scientific discoveries. It is nearly impossible to give an objective view of data, therefore, the tobacco industry was able to manipulate and warp scientific language to highlight or cloud specific information. This case serves as a warning to think critically and remain vigilant of information and facts being marketed to society as truth.

Confirmation Bias

“Anyone who has common sense will remember that the bewilderments of the eyes are of two kinds, and arise from two causes, either from coming out of the light or from going into the light” (Plato, 2014).

Confirmation bias is the tendency of a person to interpret information to fit with their preconceived notions of reality, favoring knowledge that confirms their own beliefs and disregarding anything that opposes what they believe. It played a significant role in the tobacco industry's strategy to sway the public. This phenomenon is exemplified by the fact that certain doctors who were themselves daily smokers, continued endorsing smoking even after the American Cancer Society's study was published (Brandt, 2012). Confirmation bias and prejudice lay at the heart of eugenics, which is the belief that there can be a superior race of humans through selective breeding. The process of eugenics is to limit the gene pool by excluding groups deemed inferior. In 1859, Charles Darwin wrote "On the Origin of Species" which examines his idea of natural selection. Natural selection is the theory that life will always adapt and change based on their environment and organisms with traits better suited to their environment will reproduce and pass on their genes while those without those traits will not. This scientific idea was a large inspiration for the eugenics movement within the United States and Germany. The term "eugenics" was created in 1883 by Francis Galton who states, "the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally." (Eugenics and Scientific Racism, n.d.). The dark truth of this practice is that it is extremely susceptible to abuse by those who determine what superior traits are. To limit certain groups of people from reproducing, forced sterilization of people would take the place of minority groups, people with developmental disabilities, and criminals (Eugenics, n.d.). Confirmation bias and prejudice played a significant role in the movement's widespread adoption, "Eugenic doctrines were articulated by physicians, mental health professionals, and scientists—notably biologists who were pursuing the new discipline of genetics—and were widely popularised in books, lectures, and articles for the educated public of the day." (Kevles,

1999). The largest example of this abuse is the Nazis who used eugenics as justification for the genocide of minority groups they did not deem fit.

The Nazi ideology was founded on the belief in racial purity and that those deemed unfit posed a threat to society. The first wave of this flawed ideology was in the form of laws passed by the Nazi party. The first law passed in 1933 was the Hereditary Health Law which mandated the sterilization of people with developmental disabilities and mental illness. In 1935, the Nazis passed the Marital Health Law that banned the marriage of people deemed unfit. The true horror of the Nazi regime was that smart people genuinely believed they were doing a great service to society. The policy and language used by the German society eventually shaped public opinion, legitimizing eugenics (Eugenics, n.d.). Eugenics laws in Germany eventually lead to euthanasia, “its aim was to exterminate the mentally ill and the handicapped, thus ‘cleansing’ the ‘Aryan’ race of persons considered genetically defective and a financial burden to society” (Nazi Persecution of the Mentally & Physically Disabled, n.d.). It is estimated that between 200,000 and 250,000 people were killed as a result of euthanasia while nearly 400,000 people were sterilized by eugenics laws in Nazi Germany (Nazi Persecution of the Mentally & Physically Disabled, n.d.).

“Darwinism by itself did not produce the Holocaust, but without Darwinism... neither Hitler nor his Nazi followers would have had the necessary scientific underpinnings to convince themselves and their collaborators that one of the world's greatest atrocities was really morally praiseworthy.” (Weikart, 2004)

This deeply flawed idea was legitimized and the consequences were unimaginable. Eugenics provided the justification for euthanasia which would later lay the groundwork for the Holocaust. The Holocaust resulted in the murder of six million Jews mainly through

extermination camps and mass shootings. The Nazis were able to hide their ideology under the veil of science, using manipulation and scientific language for justification of genocide.

Prejudice played a pivotal role in the widespread adoption of eugenics where pseudoscience was able to fester and genocide was rationalized. The issue is as scientific philosophy becomes more popular it fuels more research, giving validity to questionable theories. The Nazis showed how science could be exploited as a tool to promote a deeply flawed ideology further. Society must learn from the mistakes of the past and it is imperative to maintain scientific integrity and ethics even in the face of the majority.

Misinformation

“Most people are not just comfortable in their ignorance, but hostile to anyone who points it out.” (Plato, 2014).

We like to dissociate ourselves from history however the past will try to always repeat itself. In current events, 1,176,639 people have died from COVID-19 in the United States (CDC, 2020). We are constantly faced with misinformation through social media and it is becoming increasingly harder to pick out what is real. At the beginning of the COVID outbreak, there was so much mystery surrounding the virus and how we should begin treating it. From the start of the pandemic, COVID-19 became a political issue when many states began to defy CDC mandates (Sylvester, 2021). Misinformation severely impacted how well the virus could be contained and it acted as a driving factor for behavior and policy. This resulted in shortages of much-needed goods due to hysteria. Moreover, social media created an environment where vaccine misinformation had a direct impact on people taking the necessary safety measures to protect themselves and their loved ones.

When the politicization of science happens during a pandemic the consequences are deadly. The media played a large role in the divide seen between medical professionals and the general public. Additionally, social media became a voice of constant misinformation from people with little to no scientific background giving medical advice to the public, “Propagation of misleading information, using “bubble filters”, and an exaggeration of facts caused a wave of stress, anxiety, confusion, and depression amongst the global population.” (Ferreira Caceres et al., 2022). Mistrust and fear created an environment where it was impossible to discern fact from fiction. Politicians are only human and they can be influenced by hysteria and public opinion just as much as the general public. Unfortunately, when public opinion begins informing public policy more than scientific findings, a virus becomes a public health crisis. These manifested in delayed response times to mask mandates and social distancing. Additionally, misinformation created immense fear and hesitancy around taking the COVID-19 vaccine due to safety concerns, “the emergency use authorization of various COVID vaccines resurfaced the general public's mistrust in science, which, combined with the rampant spread of falsified information, made vaccine hesitancy a parallel pandemic.” (Ferreira Caceres et al., 2022). Protests to these safety measures resulted in preventable infections and deaths.

This case highlights the need for communication between local government agencies, social media companies, and healthcare experts as together they can combat the spread of misinformation. The pandemic showed how misleading data and science can erode the public's trust in established health guidelines, ultimately worsening the spread of COVID-19. It should also be noted how important it is to monitor and vet information being relayed to the public on social media as the pandemic has shown the catastrophic impact misinformation can have on public health.

Conclusion

At the start of each section in this research paper is a quote from Plato's "The Allegory of the Cave". In this book, three prisoners are chained to the walls of a cave, and all the information they receive from the world is through shadows cast on the walls. They believe these shadows are reality as they are unable to turn their heads to see the objects casting the shadows. One of the prisoners suddenly becomes free from his chains and he can exit the cave and see life outside. When he comes back to the prisoners to tell them what he has learned about the outside world they become hostile and refuse to believe anything he says, choosing to stay in their ignorance (Plato, 2014). I have found this to be an excellent analogy for the politicization of science.

One of the greatest horrors the Nazis showed through eugenics was that even the smartest people in society are susceptible to confirmation bias and prejudice. The Germans were part of an extremely educated society and the Nazi ideology was accepted among very intelligent people. Uneducated people do not come up with efficient killing machines. They do not create gas chambers. Intelligent people do. Smart people, engineers, and bright politicians created machines of mass genocide, believing they were doing a great service to society.

The tobacco industry, eugenics, and the COVID-19 pandemic show what can happen when ethics and scientific integrity are not at the forefront of research. Science does not exist in a vacuum and it is constantly influenced by the needs of society. These cases reinforce the need for transparency and ethical guidelines in scientific research. Manipulating results to fit with an ideal outcome completely distorts the very foundation of what science is built on. Scientists must stay impartial and unbiased. When prejudice becomes a factor in scientific discovery there should be clear consequences.

In these three cases, the pursuit of financial gain, power, and control sidelined any ethical questions of morality. The results of these three cases serve as a warning to society to never blindly follow the majority. It is imperative to think critically and remain objective as history has shown the lengths a flawed way of thinking can spread like a disease, infecting even the most well-intentioned. It is ultimately society's job to determine how its knowledge will be used. By examining eugenics, the link between cancer and tobacco, and the COVID-19 pandemic, it becomes clear how science can be exploited for certain agendas. It is crucial to apply ethics to science as history has shown the abuse and corruption that can come from knowledge and ideas as a result of moral ambiguity.

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