Looking into why those in American society believe in pseudoscience

Introduction

This research report aims to analyze why so many Americans believe in pseudoscience and to explain how pseudoscience spreads across American society.

Growing numbers of people believe in conspiracies, push pseudoscientific ideas to the American public, and/or deny science altogether. For example, in the case of paranormal beliefs, about 41% of Americans believe in extra-sensory perception and 25% believe astrology can affect human lives (Moore, 2005). The numbers are also growing in ways that can affect our society, such as slowing progress in scientific research to improve lives and refusing vaccinations to protect communities from sicknesses.

Merriam-Webster defines pseudoscience as theories, assumptions, and methods erroneously regarded as scientific (Merriam-Webster, n.d.). So why do so many Americans believe in pseudoscientific ideas? An interview with a Kennesaw State University (KSU) biology professor and director of laboratory safety and operations reveals that it may be due to scientific illiteracy. Flat-Earth believers, for example, derive explanations from early, initial models of Earth drawn on paper with the ground underneath and the sky above, instead of the accepted scientific model of the Earth (Vosniadou, S., 1994). From an alternative psychological viewpoint, pseudoscientific ideas infiltrate the human mind and as people try to make sense of seemingly false information by comparing it to their prior beliefs, they may come across information that leads them to accept pseudoscience (Mermelstein, S., and German, T. C., 2021).

Sperber (1994) argues that people will persistently believe in an illusion, even when having knowledge of the characteristics that prove it is an illusion. Thus, people may give up on a factual belief and still feel the remnants of its factual elements, while also feeling the false characteristics of the newly adopted false belief. An example is believing in the Holy Trinity, yet knowing a father and son cannot be the same person. The false belief can become prevalent in a population if everyone in the population shares this same way of thinking.

Similar sentiments that combine the KSU professor's ideas and the psychological study is the idea that people don't initially intend to be science deniers, but they are victims of misinformation from someone who is trying to profit from the spread of that information (Berger, K., 2022).

These explanations attempt to answer the assumptions that people are more susceptible to believing pseudoscientific ideas when they are not well-educated about scientific methods, and people are more susceptible to pseudoscientific ideas when the information confirms previous biases.

Methods

In gathering data for this research report, an interview was conducted with an individual in the scientific field. The following questions were asked:

- In your own words, what is pseudoscience?
- What is your opinion of it being practiced?
- How do you think pseudoscience affects our society?
- What kinds of people do you think follow these types of ideas?
- Do you think there is some room to use pseudoscience on a small scale?

There was also a rhetorical analysis of the article, *Counterintuitive Pseudoscience Propagates by Exploiting the Mind's Communication Evaluation Mechanisms*. The purpose of the analysis was to determine what the authors were trying to persuade and look into what methods the authors used to make sure the article was persuasive. Cannons of rhetoric and the four basic rhetorical appeals were also examined in analyzing if the article was persuasive in understanding how and why pseudoscience affects people in American society.

Results

The results are as follows:

- The result of the interview is the conclusion that there is not enough scientific literacy.

- Mermelstein and German (2021) concluded that pseudoscience has features that infiltrate the mind's communication evaluation mechanisms. People use attention-grabbing and memorable content, authoritative sources, and reasonable arguments to exploit the mind's evaluation processes to spread pseudoscientific beliefs.

- Citizens fall victim to the wrong people who spread misinformation for profit.

Discussion

Authoritative figures use attention-grabbing and memorable content, coupled with reasonable arguments, to exploit the mind's evaluation processes and the

lack of scientific literacy, to spread pseudoscientific beliefs for their own benefit.

Scientific Illiteracy

During the interview, the professor defined pseudoscience as a set of false claims that have no scientific basis. People fall into traps because they have no scientific literacy to look for the validity of the claims, such as using scientific literacy to confirm that a product doesn't work. The news media promotes pseudoscience, either for an ulterior motive or to justify pushing a product that may cause harm, and what the media says is trusted as the end-all, be-all. The information needs to be taken with a grain of salt and then it needs to be verified, but the verification has to be based on the scientific method.

Expressing similar ideas, Berger, K. (2022) explains that those who are slightly educated about the scientific process have simply fallen victim to the wrong people who give misinformation for profit. Their true nature isn't to be science-deniers or anti-science; they did their own research about something they believe has been tested and shown.

The person researches the information online to find out there are a lot of people with those same opinions. The person voices those concerns to a science professional, his/her doctor, who scoffs at the ideas. That person's ego is hurt, so s/he starts to watch YouTube videos and get involved in communities that share his/her thoughts and welcome those concerns (Berger, K., 2022). This is an explanation of why citizens begin to believe in pseudoscience, and ultimately how it spreads to others.

Scientists wishing to be trusted because they have the education, who state that they know more than those with less education in the field, are not using the best approach to convince the science deniers. Explaining in detail what they know and why they know it will work better and expressing humility in their explanation helps build trust. That way, getting the person to listen to the expert allows room for the person to listen to the expert's information, creating more literacy in scientific education (Berger, K., 2022).

Psychological View

Pseudoscience spreads because the ideas resonate with intuitive thoughts (Sperber, 1994). Mermelstein, S., and German, T. C. (2021) expound on the concept of counterintuitive pseudoscience, which is a combination of pseudoscientific beliefs and content that is counterintuitive. The authors argue that counterintuitive concepts are incompatible with the foundations of the human mind and how humans make sense of the world, yet counterintuitive concepts are still widespread.

A reason behind beliefs in pseudoscience with counterintuitive elements may be due to information that is spread being consistent with human intuitions, which is repeated to others with the same intuition, then the pseudoscientific information becomes more widespread than counterintuitive information (Mermelstein, S., and German, T. C., 2021).

A potential second reason behind the spread of counterintuitive elements may be due to the idea that the mind can evaluate and filter information, or use communication evaluation mechanisms. The mind does this by fact-checking information and seeing if it is consistent with prior beliefs (Mermelstein, S., and German, T. C., 2021). Pseudoscientific ideas do not fully concur with prior beliefs, but when the ideas catch one's attention, a memory of having visited the ideas triggers the notion to search for more information, which may result in past ideas being retransmitted. While searching to find out more information, those ideas become beliefs with evidence from seemingly authoritative sources or reasoned arguments. In this way, pseudoscience gains prominence in a society by exploiting the mind's evaluation and fact-checking processes, but the person does not yet fully commit to believing in the ideas (Mermelstein, S., and German, T. C., 2021).

As people try to make sense of counterintuitive information and compare it to their prior beliefs, they may come across information that leads them to accept pseudoscience, since there are features of it that exploit the mind's evaluation processes to become attention-grabbing and memorable, then it is passed on to others. People also endorse pseudoscientific beliefs through various sources if the information is from an authoritative figure or a reasonable argument. This is how pseudoscience is planted, then spread throughout an entire culture (Mermelstein, S., and German, T. C., 2021).

Conclusion

In analyzing why so many Americans believe in pseudoscience, and to explain how pseudoscience spreads across American society, the information gathered concludes that people fall into traps because they have little to no scientific literacy to follow the scientific method in verifying if certain information isn't true. Having little to no scientific literacy is how people become victims of misinformation that is spread by those wanting to gain profit. People in respected professions know how to use pseudoscience to exploit the mind's evaluation processes to become attention-grabbing and memorable, then the ideas are passed on to the public. Citizens hear these opinions, research non-peer-reviewed information online that correlates with previous thoughts, then gather in communities with people who share their thoughts. The ideas of those in the respected professions are endorsed in the echo chambers.

The research confirms that people are more susceptible to believing pseudoscientific ideas when they are not well-educated about scientific methods, and that people are more susceptible to pseudoscientific ideas when the information confirms previous biases.

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