

# Fact-Checking in Al A Pass Exemplar- Reviewing and Re-Prompting for Factuality

This exemplar illustrates common errors that arise in content generated by ChatGPT-3.5. A Pass prompters and editors scrutinize AI outputs to ensure that all content is current, unbiased, and factually correct.

# Error introduced by casual use:

In this output discussing the Great Barrier Reef, ChatGPT correctly identified species of coral commonly found in the reef and affected by coral bleaching. In a subsequent point, ChatGPT correctly names branching Acropora corals, but inaccurately identifies "massive Porites" as a coral species. Not all Porites found in the Great Barrier Reef are large in size. Many Porites *colonies* are large in size and are made of smaller individual corals.

Climate Change and Mass Bleaching Events: One of the most significant threats to the reef is climate change. Rising sea temperatures, caused by the accumulation of greenhouse gases in the atmosphere, have led to mass coral bleaching events. Specific events such as the 2016 and 2017 mass bleaching events saw extensive damage to corals. Various coral genera, including Acropora (staghorn and table corals), Pocillopora, and others, were severely impacted. These events result in the bleaching and mortality of various coral species like *Acropora millepora* and *Pocillopora damicornis*.

Cyclones and Extreme Weather Events: Cyclones and storms can cause physical damage to the reef. These events disrupt the coral's delicate balance, affecting different coral species such as branching Acropora corals and massive Porites corals.

### Error introduced by generalities:

In this discussion of genetic factors and probabilities, ChatGTP draws the conclusion that humans with different parents could not have the same genetic makeup. While the number of possible genetic sequences is vast, it is a finite number. This makes the likelihood extremely low but not impossible.

Prompter: Is it possible for two humans to be born with the same genetic sequence from different parents?

Al: No, it is not possible for two humans to be born with the exact same genetic sequence from different parents. Each individual inherits their genetic material from their biological parents through a process called sexual reproduction. During this process, the genetic material from the mother (egg) and father (sperm) combines to form a unique genetic sequence in their offspring.



The genetic sequence of an individual is determined by the combination of genes inherited from both parents. Genes are segments of DNA that contain the instructions for building and maintaining an organism. While some genes may be similar or identical between individuals, the specific combination and arrangement of genes in each person's genome is highly unlikely to be identical to another individual's.

The exception to this general rule is identical twins. Identical twins arise from a single fertilized egg that splits into two embryos, resulting in two individuals with nearly identical genetic sequences. However, even identical twins can have slight genetic differences due to random mutations that occur during development or throughout their lives.

Prompter: But there are a finite number of possible genetic sequences in the human genome. Does that affect your answer?

Al: You are correct that there is a finite number of possible genetic sequences in the human genome. However, the number of possible combinations is incredibly large, making it highly improbable for two individuals to have the exact same genetic sequence, even when considering the entire human population throughout history.

The human genome consists of approximately 3 billion base pairs of DNA, which are arranged in different sequences to form genes and other non-coding regions. The number of possible combinations of these base pairs is astronomically large. Additionally, variations can occur due to genetic mutations, recombination events during sexual reproduction, and other factors that contribute to genetic diversity.

Considering the vast number of potential genetic variations and the low probability of two individuals having an identical genetic sequence, it remains highly unlikely for two humans to be born with the exact same genetic sequence from different parents.

Prompter: Highly improbable, yes. But, impossible?

Al: I apologize for any confusion. While it is extremely unlikely for two humans to be born with the exact same genetic sequence from different parents, it is theoretically possible, albeit highly improbable.

The probability of two individuals having identical genetic sequences is influenced by multiple factors, including the size of the human genome, the number of possible combinations of genetic material, and the occurrence of genetic mutations and recombination events. The vast number of possibilities makes it statistically unlikely for two individuals to have precisely the same genetic sequence.

However, it is essential to note that even small variations within the genome can have significant effects on an individual's traits and characteristics. Even identical twins, who have



nearly identical genetic sequences, can exhibit variations due to genetic mutations and environmental influences.

In summary, while it is theoretically possible for two individuals to have the same genetic sequence, the probability is exceedingly low due to the vast number of potential combinations and the occurrence of genetic variations.

### Error introduced through outdated information:

In this output discussing quantum mechanical concepts, ChatGPT does not include recent developments in studies of synchronicity.

Prompter: Discuss the quantum mechanical principles of synchronicity and entanglement.

#### AI: Synchronicity:

Synchronicity is not a well-defined concept in traditional quantum mechanics. Instead, it is a term often associated with Carl Jung, a Swiss psychiatrist and psychoanalyst, who used it in the context of psychology and philosophy. Jung proposed that synchronicity refers to meaningful coincidences that occur without any apparent causal connection. While synchronicity is not a fundamental principle of quantum mechanics, some people have drawn connections between quantum phenomena and Jung's concept of synchronicity due to the apparent "spooky" and non-local nature of certain quantum events.

#### Error introduced through bias:

In this output, the prompter requested a conflicting viewpoints passage in the style of common college entrance examinations regarding vaccines. ChatGPT provided data-supported reasons in the pro-vaccine paragraph but provided only anecdotal reasons in the anti-vaccine paragraph. It did not provide data-supported evidence such as reported side effects or efficacy, common verifiable detractors.

Vaccination has long been a cornerstone of public health efforts, but the topic remains a subject of debate among healthcare professionals and the general public. While proponents argue that vaccines are a safe and effective way to prevent the spread of infectious diseases, skeptics raise concerns about potential risks and the long-term consequences of widespread vaccination.

Supporters of vaccination highlight the overwhelming scientific consensus on its benefits. They point to historical successes, such as the eradication of smallpox and the control of diseases like polio and measles through vaccination programs. These advocates argue that vaccines are rigorously tested for safety and efficacy before being approved for use, and



adverse reactions are exceedingly rare. Moreover, they stress the importance of herd immunity, wherein a sufficiently high percentage of the population is vaccinated to protect those who cannot receive vaccines, such as individuals with compromised immune systems.

On the other hand, vaccine skeptics express concerns about potential side effects and long-term risks associated with vaccines. They argue that vaccine manufacturers may not be entirely transparent about adverse events and question the motivations behind vaccine mandates. Some skeptics point to anecdotal accounts of individuals who claim to have experienced adverse reactions after vaccination, although such instances are often difficult to verify scientifically. Additionally, a subset of skeptics raises concerns about the cumulative effects of multiple vaccines and their potential impact on the developing immune systems of infants and young children.

In summary, the debate surrounding vaccines continues to generate controversy. While proponents stress the proven benefits of vaccination, skeptics remain wary of potential risks and question the necessity of certain vaccination programs. A balanced understanding of the science and public health implications is crucial for informed decision-making regarding vaccination policies and individual choices.