

TEXTO 1

What's the difference between deductive reasoning and inductive reasoning?

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Sherlock Holmes, the fictional sleuth who famously resides on Baker Street, is known for his impressive powers of logical reasoning. With a quick visual sweep of a crime scene, he generates hypotheses, gathers observations and draws inferences that ultimately reveal the responsible criminal's methods and identity.

Holmes is often said to be a master of deductive reasoning, but he also leans heavily on inductive reasoning. Because of their similar names, however, these concepts are easy to mix up.

So what's the difference between deductive and inductive reasoning?

What is deductive reasoning?

Deductive reasoning, also known as deduction, is a basic form of reasoning that uses a general principle or premise as grounds to draw specific conclusions.

This type of reasoning leads to valid conclusions when the premise is known to be true — for example, "all spiders have eight legs" is known to be a true statement. Based on that premise, one can reasonably conclude that, because tarantulas are spiders, they, too, must have eight legs.

The scientific method uses deduction to test scientific hypotheses and theories, which predict certain outcomes if they are correct, said Sylvia Wassertheil-Smoller, a researcher and professor emerita at Albert Einstein College of Medicine.

"We go from the general — the theory — to the specific — the observations," Wassertheil-Smoller told Live Science. In other words, theories and hypotheses can be built on past knowledge and accepted rules, and then tests are conducted to see whether those known principles apply to a specific case.

Deductive reasoning begins with a first premise, which is followed by a second premise and an inference, or a conclusion based on reasoning and evidence. A common form of deductive reasoning is the "syllogism," in which two statements — a major premise and a minor premise — together reach a logical conclusion.

For example, the major premise "Every A is B" could be followed by the minor premise "This C is A." Those statements would lead to the conclusion that "This C is B." Syllogisms are considered a good way to test deductive reasoning to make sure the argument is valid.

What is inductive reasoning?

Inductive reasoning uses specific and limited observations to draw general conclusions that can be applied more widely. So while deductive reasoning is more of a top-down approach — moving from a general premise to a specific case — inductive reasoning is the opposite. It uses a bottom-up approach to generate new premises, or hypotheses, based on observed patterns, according to the University of Illinois.

Inductive reasoning is also called inductive logic or inference. "In inductive inference, we go from the specific to the general," Wassertheil-Smoller told Live Science. "We make many observations, discern a pattern, make a generalization, and infer an explanation or a theory."

In science, she added, there is a constant interplay between inductive and deductive reasoning that leads researchers steadily closer to a truth that can be verified with certainty,

The reliability of a conclusion made with inductive logic depends on the completeness of the observations. For instance, let's say you have a bag of coins; you pull three coins from the bag, and each coin is a penny. Using inductive logic, you might then propose that all of the coins in the bag are pennies.

Even though all of the initial observations — that each coin taken from the bag was a penny — are correct, inductive reasoning does not guarantee that the conclusion will be true. The next coin you pull could be a quarter.

Despite this inherent limitation, inductive reasoning has its place in the scientific method, and scientists use it to form hypotheses and theories. Researchers then use deductive reasoning to apply the theories to specific situations.

1. No método científico, o raciocínio dedutivo

- a) é utilizado para testar resultados.
- b) pode produzir certas teorias.
- c) permite prever possíveis resultados.
- d) usa princípios específicos para testar hipóteses.

2. No raciocínio dedutivo, o uso de silogismos

- a) garante a validação de um argumento.
- b) leva a inferências baseadas em evidências.
- c) consiste na relação entre duas premissas de mesma abrangência.
- d) parte da observação de casos particulares para chegar a uma conclusão mais geral.

3. Identifique a palavra que pode substituir o termo *draw* (em destaque) sem causar prejuízo ao sentido do trecho.

- a) bring
- b) paint
- c) choose
- d) gather

Texto 2

How to define artificial general intelligence

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The idea of machines outsmarting humans has long been the subject of science fiction. Rapid improvements in artificial-intelligence (ai) programs over the past decade have led some experts to conclude that science fiction could soon become fact. On March 19th Jensen Huang, the chief executive of Nvidia, the world's biggest manufacturer of computer chips and its third most valuable publicly traded company, said he believed today's models could advance to the

point of so-called artificial general intelligence (agi) within five years. What exactly is agi—and how can we judge when it has arrived?

Mr Huang's words should be taken with a pinch of salt: Nvidia's profits have soared because of the growing demand for its high-tech chips, which are used to train ai models. Promoting ai is thus good for business. But Mr Huang did set out a clear definition of what he believes would constitute agi: a program that can do 8% better than most people at certain tests, such as bar exams for lawyers or logic quizzes.

This proposal is the latest in a long line of definitions. In the 1950s Alan Turing, a British mathematician, said that talking to a model that had achieved agi would be indistinguishable from talking to a human. Arguably the most advanced large language models already pass the Turing test. But in recent years tech leaders have moved the goalposts by suggesting a host of new definitions. Mustafa Suleyman, co-founder of DeepMind, an ai-research firm, and chief executive of a newly established ai division within Microsoft, believes that what he calls "artificial capable intelligence"—a "modern Turing test"—will have been reached when a model is given \$100,000 and turns it into \$1m without instruction. (Mr Suleyman is a board member of *The Economist's* parent company.) Steve Wozniak, a co-founder of Apple, has a more prosaic vision of agi: a machine that can enter an average home and make a cup of coffee.

Some researchers reject the concept of agi altogether. Mike Cook, of King's College London, says the term has no scientific basis and means different things to different people. Few definitions of agi attract consensus, admits Harry Law, of the University of Cambridge, but most are based on the idea of a model that can outperform humans at most tasks—whether making coffee or making millions. In January researchers at DeepMind proposed six levels of agi, ranked by the proportion of skilled adults that a model can outperform: they say the technology has reached only the lowest level, with ai tools equal to or slightly better than an unskilled human.

The question of what happens when we reach agi obsesses some researchers. Eliezer Yudkowsky, a computer scientist who has been fretting about ai for 20 years, worries that by the time people recognise that models have become sentient, it will be too late to stop them and humans will become enslaved. But few researchers share his views. Most believe that ai is simply following human inputs, often poorly.

There may be no consensus about what constitutes agi among academics or businessmen—but a definition could soon be agreed on in court. As part of a lawsuit lodged in February against Openai, a company he co-founded, Elon Musk is asking a court in California to decide whether the firm's gpt-4 model shows

signs of agi. If **it** does, Mr Musk claims, Openai has gone against its founding principle that it will license only pre-agi technology. The company denies that it has done so. Through his lawyers, Mr Musk is seeking a jury trial. Should his wish be granted, a handful of non-experts could decide a question that has vexed ai experts for decades.

4. Antes de apresentar a definição de agi dada por Jensen Huang, o texto traz uma observação, que inicia com a frase a seguir (em destaque no texto): “Mr Huang’s words should be taken with a pinch of salt”. Explique o sentido e a importância dessa introdução ao conceito de agi.

5. O texto traz a visão de empreendedores e de acadêmicos em relação ao conceito de agi. Faça um resumo da visão dos pesquisadores sobre o tema.

6. Segundo o texto, os non-experts (em destaque no texto) responsáveis por decidir qual é a definição mais adequada para agi

- a) podem ser os empresários.
- b) podem ser os acadêmicos.
- c) podem ser os advogados de Elon Musk.
- d) podem ser os jurados em um tribunal.

7. A que palavras ou segmentos se refere o pronome it (em destaque no texto):

- a) Elon Musk
- b) a court in California
- c) the firm
- d) gpt-4 model

TEXTO 3

Touch can reduce pain, depression and anxiety, say researchers

Whether it is a hug from a friend or the caress of a weighted blanket, the sensation of touch appears to bring benefits for the body and mind, researchers say.

The sense of touch is the first to develop in babies and is crucial in allowing us to experience the environment around us as well as communicate. Indeed, the loss of touch from others during the Covid pandemic hit many hard.

However, while myriad studies have suggested touch is beneficial for our health, few have attempted to draw the vast field of research together.

Now experts have done just that, revealing a simple message: touch helps.

Dr Helena Hartmann, a co-author of the research from University Hospital Essen, said: “More consensual touch events throughout our day can help alleviate or potentially buffer against mental and physical complaints.”

Published in the journal *Nature Human Behaviour*, the research encompassed 212 previously published studies and included a statistical analysis of 85 studies involving adults and 52 involving newborns.

Among the results, the team found touch was just as beneficial for mental health as physical health – a finding that held for adults and newborns – although touch had a bigger impact on some areas than others.

“Our work illustrates that touch interventions are best suited for reducing pain, depression and anxiety in adults and children as well as for increasing weight gain in newborns,” the researchers write.

The analysis revealed humans gained similar benefits in terms of their physical health when touched by other humans as by objects – such as social robots or weighted blankets.

Hartmann said that was a surprise. “This means we need to undertake more research on the potential of weighted blankets or social robots to improve people’s wellbeing, especially during contact-limiting situations like the recent Covid-19 pandemic,” she said. The positive impact on mental health was larger for human touch than touch from objects – possibly, the team said, because it involved skin-to-skin contact.

Among other results, the team found touch was beneficial for both healthy and unwell people, although the impact was larger among the latter for mental health benefits.

The type of touch and its duration was not important, although greater frequency was associated with greater benefits in adults.

Further, touching the head was associated with greater health benefits than touching other parts of the body.

The team cautioned that some of the findings could be false positives, while it was not clear if they would hold across different cultures.

Dr Mariana von Mohr, from Royal Holloway, University of London, who was not involved in the work, said if future robots could more accurately replicate the texture and warmth of human skin, they may be able to provide comparable mental health benefits to human touch.

“[These properties are] important because our skin contains specialised sensors, known as C-tactile afferents, which are particularly receptive to gentle, caressing touch and temperature similar to that of human skin, factors that are also thought to facilitate emotional regulation,” she said.

Prof Katerina Fotopoulou, at University College London, said the research gave a bird’s-eye view of the benefits of touch interventions on health.

8. Os resultados da pesquisa apresentada no texto mostram que

- a) o impacto dos benefícios por meio do toque foi diferente no que diz respeito à saúde mental, considerando pessoal saudáveis e indispostas.
- b) o toque contribuiu na redução da dor, depressão, ansiedade e ganho de peso em adultos.
- c) os benefícios do toque humano e do toque por meio de objetos foram os mesmos em se tratando de saúde mental.
- d) o tipo de toque, sua duração e frequência não tiveram importância significativa nos resultados da pesquisa.

9. No fazer científico, os resultados de um estudo podem gerar a necessidade ou a oportunidade de novas pesquisas. Isso aconteceu com os resultados do estudo apresentado no texto? Explique.

10. A que palavras ou segmentos se refere o pronome **they** (em destaque no texto):

- a) the team
- b) the findings
- c) false positives
- d) different cultures