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Deductive reasoning uses given information, premises or accepted general rules to reach a proven conclusion. On the other hand, inductive logic or reasoning involves making generalizations based upon behavior observed in specific cases. Deductive arguments are either valid or invalid. But inductive logic allows for the conclusions to be wrong even if the premises upon which it is based are correct. So inductive arguments are either strong or weak. Deductive reasoning applies general rules to make conclusions about specific cases. Inductive reasoning observes patterns in specific cases to infer conclusions about general rules. For example: All men are mortal. John is a man. Therefore John is mortal. This is an example of valid deductive reasoning. On the other hand, here's an example of inductive reasoning: Most men are right-handed. John is a man. Therefore, John must be right-handed. The strength of this inductive argument depends upon the percentage of left-handed people in the population. In any case, the conclusion may well end up being invalid because inductive reasoning does not guarantee validity of the conclusions. What is Deductive Reasoning? Deductive reasoning (top-down logic) contrasts with inductive reasoning (bottom-up logic), and generally starts with one or more general statements or premises to reach a logical conclusion. If the premises are true, the conclusion must be valid. Deductive resasoning is used by scientists and mathematicians to prove their hypotheses. Sound or Unsound arguments With deductive reasoning, arguments may be valid or invalid, sound or unsound. If the logic is correct, i.e. the conclusion flows from the premises, then the arguments are valid. However, valid arguments may be sound or unsound. If the premises used in the valid argument are true, then the argument is sound otherwise it is unsound. For example, All men have ten fingers. John is a man. Therefore, John has ten fingers. This argument is logical and valid. However, the premise "All men have ten fingers." is incorrect because some people are born with 11 fingers. Therefore, this is an unsound argument. Note that all invalid arguments are also unsound. Types of deductive logic Law of detachment A single conditional statement is made, and a hypothesis (P) is stated. The conclusion (Q) is then deduced from the statement and the hypothesis. For example, using the law of detachment in the form of an if-then statement: (1.) If an angle A>90°, then A is an obtuse angle. (2.) A=125°. (3.) Therefore, A is an obtuse angle. The law of Syllogism The law of syllogism takes two conditional statements and forms a conclusion by combining the hypothesis of one statement with the conclusion of another. For example, (1.) If the brakes fail, the car will not stop. (2.) If the car does not stop, there will be an accident. (3.) Therefore, If the brakes fail, there will be an accident. We deduced the final statement by combining the hypothesis of the first statement with the conclusion of the second statement. What is Inductive Reasoning? Inductive reasoning, or induction, is reasoning from a specific case or cases and deriving a general rule. This is against the scientific method. It makes generalizations by observing patterns and drawing inferences that may well be incorrect. Cogent and Uncogent Arguments Strong arguments are ones where if the premise is true then the conclusion is very likely to be true. Conversely, weak inductive arguments are such that they may be false even if the premises they are based upon are true. If the argument is strong and the premises it is based upon are true, then it is said to be a cogent argument. If the argument is weak or the premises it flows from are false or unproven, then the argument is said to be uncogent. For example, here is an example of a strong argument. There are 20 cups of ice cream in the freezer. 18 of them are vanilla flavored. Therefore, all cups of ice cream are vanilla. If in the previous argument premise #2 was that 2 of the cups are vanilla, then the conclusion that all cups are vanilla would be based upon a weak argument. In either case, all premises are true and the conclusion may be incorrect, but the strength of the argument varies. Types of Inductive Reasoning Generalization A generalization proceeds from a premise about a sample to a conclusion about the population. For example, (1.) A sample S from population P is chose. Q percentage of the sample S has attribute A. (2.) Therefore, Q percentage of the population P has attribute A. Statistical Syllogisms A statistical syllogism proceeds from a generalization to a conclusion about an individual. For example, (1.) A proportion Q of population P has attribute A. (2.) An individual X is a member of P. (3.) Therefore, there is a probability which corresponds to Q that X has an attribute A. More Examples Examples of Deductive Reasoning Quadrilateral ABCD has sides AB ll CD (parallel) and sides BC ll AD. Prove that it is a parallelogram. In order to prove this, we have to use the general statements given about the quadrilateral and reach a logical conclusion. Another example of deductive logic is the following reasoning: Examples of Inductive Reasoning If the three consecutive shapes are triangle, square and pentagon which would be the next shape? If the reasoner observes the pattern, she will observe that the number of sides in the shape increase by one and so a generalization of this pattern would lead her to conclude that the next shape in the sequence would be a hexagon. Applications of Inductive and Deductive Reasoning Deduction can also be temporarily used to test an induction by applying it elsewhere. A good scientific law is highly generalized like that in Inductive reasoning and may be applied in many situations to explain other phenomena. Deductive reasoning is used to deduce many experiments and prove a general rule. Bias Inductive reasoning is also known as hypothesis construction because any conclusions made are based on current knowledge and predictions. As with deductive arguments, biases can distort the proper application of inductive argument, which prevents the reasoner from forming the most logical conclusion based on the clues. Availability Heuristic The availability heuristic causes the reasoner to depend primarily upon information that is readily available. People have a tendency to rely on information that is easily accessible in the world around them. This can introduce bias in inductive reasoning. Confirmation bias The confirmation bias is based on the natural tendency to confirm, rather than to deny a current hypothesis. For example, for several centuries it was believed that the sun and planets orbit the earth. References Share this comparison via: If you read this far, you should follow us: "Deductive vs Inductive." Diffen.com. Diffen LLC, n.d. Web. 16 Jun 2025. < > The main difference between inductive and deductive reasoning is that inductive reasoning aims at developing a theory while deductive reasoning aims at testing an existing theory. Inductive reasoning moves from specific observations to broad generalisations, and deductive reasoning the other way around. Both approaches are used in various types of research, and it's not uncommon to combine them in one large study. Inductive research approach When there is little to no existing literature on a topic, it is common to perform inductive research because there is no theory to test. The inductive approach consists of three stages: Observation A low-cost airline flight is delayed Dogs A and B have fleas Elephants depend on water to exist Observe a pattern Another 20 flights from low-cost airlines are delayed All observed dogs have fleas All observed animals depend on water to exist Develop a theory or general (preliminary) conclusion Low-cost airlines always have delays All dogs have fleas All biological life depends on water to exist Limitations of an inductive approach A conclusion drawn on the basis of an inductive method can never be proven, but it can be invalidated. Example You observe 1,000 flights from low-cost airlines. All of them experience a delay, which is in line with your theory. However, you can never prove that flight 1,001 will also be delayed. Still, the larger your dataset, the more reliable the conclusion. Deductive research approach When conducting deductive research, you always start with a theory (the result of inductive research). Reasoning deductively means testing these theories. If there is no theory yet, you cannot conduct deductive research. The deductive research approach consists of four stages: Start with an existing theory (and create a problem statement) Low-cost airlines always have delays All dogs have fleas All biological life depends on water to exist Formulate a falsifiable hypothesis based on existing theory If passengers fly with a low-cost airline, then they will always experience delays All pet dogs in my apartment building have fleas All land mammals depend on water to exist Collect data to test the hypothesis Collect flight data of low-cost airlines Test all dogs in the building for fleas Study all land mammal species to see if they depend on water Analyse and test the data 5 out of 100 flights of low-cost airlines are not delayed 10 out of 20 dogs didn't have fleas All land mammal species depend on water Decide whether you can reject the null hypothesis 5 out of 100 flights of low-cost airlines are not delayed = reject hypothesis 10 out of 20 dogs didn't have fleas = reject hypothesis All land mammal species depend on water = support hypothesis Limitations of a deductive approach The conclusions of deductive reasoning can only be true if all the premises set in the inductive study are true and the terms are clear. Example: Premises and conclusion All dogs have fleas (premise) Benno is a dog (premise) Benno has fleas (conclusion) Based on the premises we have, the conclusion must be true. However, if the first premise turns out to be false, the conclusion that Benno has fleas cannot be relied upon. Combining inductive and deductive research Many scientists conducting a larger research project begin with an inductive study (developing a theory). The inductive study is followed up with deductive research to confirm or invalidate the conclusion. In the examples above, the conclusion (theory) of the inductive study is also used as a starting point for the deductive study. Frequently asked questions about inductive vs deductive reasoning If you want to cite this source, you can copy and paste the citation or click the 'Cite this Scribbr article' button to automatically add the citation to our free Reference Generator. Streefkerk, R. (2022, October 10). Inductive vs Deductive Reasoning | Difference & Examples. Scribbr. Retrieved 17 June 2025, from When making decisions, solving problems, or analyzing information, people rely on reasoning to draw conclusions. Two of the most widely used reasoning methods are deductive and inductive reasoning. But what's the difference? And how do they apply in real-world situations, especially in hiring, problem-solving, and decision-making? In this guide, we'll explore: What deductive reasoning is What inductive reasoning is Key differences between the two Real-world examples of both reasoning methods Related: What is Inductive Reasoning? Why You Should Test It Deductive reasoning is a top-down approach to logic, meaning it moves from general principles to specific conclusions. Starts with a general premise (a known fact or rule). Applies it to a specific case. Arrives at a logically certain conclusion. Premise 1: All software engineers need coding skills.Premise 2: James is a software engineer.Conclusion: Therefore, James needs coding skills. Since the premises are true, the conclusion must be true. Related: Example of Strong Inductive Arguments Inductive reasoning is a bottom-up approach, meaning it moves from specific observations to broader generalizations. Starts with specific data or observations. Identifies patterns or trends. Forms a probable conclusion (but not always 100% certain). The last five marketing campaigns that used video ads performed well. The latest industry report suggests video content increases engagement. Conclusion: Using video ads in marketing likely leads to better performance. Unlike deductive reasoning, the conclusion is probable but not guaranteed. Related: Inductive Reasoning Questions for Employment The table below summarizes the main differences between deductive and inductive reasoning: FeatureDeductive ReasoningInductive ReasoningApproachTop-downBottom-upStarts withGeneral premiseSpecific observationsLeads toA definite conclusionA probable conclusionExample"All birds have feathers. A sparrow is a bird. Therefore, a sparrow has feathers.""I have seen 10 sparrows, and they all have feathers. Therefore, all birds may have feathers."Reliability100% certain (if premises are correct)Likely true, but not guaranteedCommon UsesMathematics, law, programmingScientific research, market analysis Related: Inductive Reasoning Problems: Types for Employers Employers use deductive reasoning tests to evaluate a candidate's ability to apply rules and logic to reach conclusions. ✔ Example Question: A company policy states that employees cannot work remotely unless they have been with the company for at least one year. Sarah has been working for the company for 6 months. Can Sarah work remotely? □ Answer: No, because she has not yet met the one-year requirement. □ Why It Matters? Deductive reasoning tests help employers assess candidates for structured problem-solving roles, such as law, finance, and technical fields. □ Related: Types of Inductive Reasoning Employers use inductive reasoning tests to assess how well candidates can identify patterns, analyze trends, and predict outcomes. ✔ Example Question: A company notices that customers who buy one product often buy another related product. What should the marketing team do next? Answer: Recommend bundling the two products in a special offer. Why It Matters? Inductive reasoning tests are useful in marketing, sales, business strategy, and innovation-driven roles. Related: Examples of Inductive Reasoning in Everyday Life ScenarioBest ApproachWhy?Solving a legal caseDeductive reasoningLegal decisions require certainty.Analyzing customer behaviorInductive reasoningRequires identifying trends from data.Programming & codingDeductive reasoningCode follows strict logic rules.Predicting market trendsInductive reasoningBased on observed patterns & analytics. Related: Deductive, Inductive, and Abductive Reasoning for Employment Yes! Many real-world situations combine both reasoning methods. Example: A manager analyzes past employee performance (inductive reasoning) and then uses a company policy to make a decision (deductive reasoning). Example: A scientist observes repeated patterns in nature (inductive) and then tests a hypothesis through experiments (deductive). □ Related: Inductive Reasoning Samples & Examples with Answers Both deductive and inductive reasoning are essential in decision-making, problem-solving, and hiring. ✔ Use deductive reasoning when clear rules apply and you need a definite conclusion.✔ Use inductive reasoning when analyzing data, trends, or patterns to make probable predictions. Understanding when and how to use each helps businesses make smarter, data-driven decisions.□ Want to test reasoning skills in candidates? Check out Inductive Reasoning Questions for Employment. Inductive reasoning and deductive reasoning represent two polar approaches to critical reasoning. But what is the difference between inductive and deductive reasoning? We're going to break down inductive vs deductive reasoning by looking at their definitions as well as some examples. By the end, you'll know how inductive and deductive reasoning are used, and how to implement them in your own writing. Inductive reasoning is a "bottom-up" process of making generalized assumptions based on specific premises. Inductions are usually made at a subconscious level, but they play an integral role in our actions and beliefs. For example, an induction could state that everybody at a party was wearing blue shirts, Laura was at the party, therefore she was wearing a blue shirt. Bottom-to-top reasoning Effective for world buildingPredictive, not certainHow to Tell Inductive from DeductiveWhat is deductive reasoning?Deductive reasoning is a "top-down" process of understanding whether or not an assumption is true, based on logic and experimentation. Deductions begin with a general assumption, then shrink in scope until a specific determination is made. For example, a general assumption may state that all dogs have eyes; this is a logical premise, but I could argue that I have eyes, therefore I must be a dog, which would prove the deduction to be illogical.Top-to-bottom reasoningEffective for reaching certain conclusionsNot a "foolproof" methodDeductive Reasoning or Inductive ReasoningInductive vs deductive reasoningWhat is inductive vs deductive reasoning?Deductive reasoning is a top-to-bottom approach that stipulates that defined premises must add up to a true conclusion. It starts with a theory that can be tested through experimentation which results in a determination. Conversely, inductive reasoning is a bottom-to-top approach which stipulates that specific observations can be used to draw general principles. It starts with a determination that can be tested through experimentation which results in a theory.Let's use deductive reasoning first:If the premises state:All good dogs follow their owner.My dog is a good dog.Then the logical conclusion would be:Therefore, my dog will follow me.This deduction is logically sound. What does "sound" mean? Soundness, in a philosophical sense, is proof that an argument is both logically valid and its premises are true. If the conclusion is proven false, then the deduction will be logically unsound.For example, if my dog doesn't follow me, then either the premise "all good dogs follow their owner" or "my dog is a good dog" has to be unfounded. In such a case, one must adjust the premises and conclusion, or abandon the hypothesis altogether.Inductive reasoning works the opposite way.For example, if the observation is:The home team has won every game I have attended.Then the logical induction would be:The home team will win the next game I attend.This induction is known as predictive because it predicts the likeliness of a future event based on past data. Predictive inductions are just one type of inductive reasoning; there are many more.Inductive and deductive reasoning may sound like difficult concepts to understand – but they're actually very simple. Of course, the intricacies of the subtypes can get tricky; I find myself getting tricked up from time to time. But just remember: deductive reasoning is a top-to-bottom approach and inductive reasoning is a bottom-to-top approach.Inductive reasoning is an exercise in generalization; AKA taking specific observations and generalizing them into greater truths.Inductive reasoning is a probability metric. Inductive logic dictates that specific experiences can be used to induce conclusions. So, what does this process actually look like?Let's break down some different types of inductive reasoning!GENERALIZATIONSTake a specific observation and make a generalized conclusion. There was a home run in the last baseball game. Therefore, there will probably be a home run in the next baseball game.STATISTICALStatistical inductions take data into account to give a more accurate prediction. There has been a home run in seven out of the last ten baseball games. So, there's a 70% chance there will be a home run in the next game.BAYESIANBayesian inferences add circumstantial information to statistical data. I've only ever seen baseball games at one stadium, so my data may not accurately reflect the whole league.ANALOGICALComparing two things with a shared quality and inducing that they must have another shared quality too. Your favorite player hit a home run. My favorite player hit a home run. Therefore, your favorite player and my favorite player are the same player.CAUSAL INFERENCEWhen you infer a causal correlation between two events. I only see players hit home runs during night games. I suspect I'll see a home run tonight since I'm going to a night game.Inductive reasoning is used all the time in everyday life. Next time you think about a "foregone conclusion," consider how that perspective developed – what observations or experiences made you think that way? And how can you improve your inductive reasoning to better reflect the complex nature of critical thought?Deductive reasoning dictates that assumptions can be proven true or false by matching the veracity of premises to a conclusion. For that reason, deductive reasoning is a certainty metric. But what does "the matching of premises to a conclusion" look like in practice?Let's break down some different types of deductive reasoning!SYLLOGISMSyllogism states that if A=B and B=C, then A=C. It takes two separate clauses and connects them together. Carrots are vegetables, vegetables are plants, therefore carrots are plants.MODUS PONENSA modus ponens is when a deduction is presented as a conditional statement, proven by subsequent clauses: the antecedent and consequent. Every person in my group has brown hair. Carlos is in my group (antecedent), therefore he must have brown hair (consequent).MODUS TOLLENSA modus tollens is the opposite of a modus ponens. Whereas the latter affirms a conditional statement, the former refutes it. The boiling point of water is 212 degrees Fahrenheit. The water is colder than 212 degrees Fahrenheit (negation of the consequent), therefore it will not boil (negation of the antecedent). Inductive and deductive reasoning may be two polar strategies to critical reasoning – but they're both incredibly useful. Want to learn more about how philosophical principles are used in writing? Check out our next article on the art of allegories in which we break down examples from Snowpiercer, Fight Club, and more. By the end, you'll know what an allegory is and how it's used in film/literature.Up Next: Allegory Definition & Examples → Write and collaborate on your scripts FREE. Create script breakdowns, sides, schedules, storyboards, call sheets and more. Tags: 12 Angry Men, Meet The Parents In the realm of logical reasoning, two key methods stand out: inductive and deductive reasoning. Understanding these methods is crucial, not just for philosophers or scientists, but for professionals in various fields. In the recruitment industry, for instance, HR managers can leverage these reasoning methods to improve their hiring processes. But what exactly are inductive vs deductive reasoning? How do they differ, and how can they be applied in real-world scenarios? In this article, we'll delve into these questions, providing a clear understanding of each concept with examples. Our goal is to help you, as an HR professional, understand how these reasoning methods can be applied in evaluating candidates and improving your hiring process. Inductive reasoning is a logical process that involves making generalizations based on specific observations. It's a bottom-up approach, starting with specific instances and using them to predict a general principle or rule. This type of reasoning is open-ended and exploratory. It allows for the possibility that the conclusion is false, even if all of the premises are true. Inductive reasoning plays a significant role in hypothesis formation and scientific research. It's also crucial in recognizing patterns and trends, which can be applied in various fields, including marketing and HR. However, it's important to note that inductive reasoning can be subject to bias due to the reliance on observational data. Let's look at some examples of inductive reasoning: Observing that the sun rises every morning and concluding that the sun will always rise. Noticing that every time you eat a certain food, you get a stomachache, and deducing that the food causes your discomfort. Seeing that a particular employee always arrives late on Mondays and assuming they have a habit of oversleeping at the start of the week. In the HR context, an example could be observing a candidate's behavior during an interview and making assumptions about their personality or work ethic. Remember, while inductive reasoning can provide valuable insights, it's essential to be aware of potential biases and not to jump to conclusions without sufficient evidence. Deductive reasoning, on the other hand, is a logical process that starts with a general statement or hypothesis and examines the possibilities to reach a specific, logical conclusion. This is a top-down approach, moving from the general to the specific. Unlike inductive reasoning, deductive reasoning is more narrow and focused. It guarantees the truth of the conclusion if the premises are true. Deductive reasoning is often used in testing hypotheses and proving theories. It's also crucial in fields that require a logical structure and sequence, such as mathematics and programming. However, the effectiveness of deductive reasoning can be limited if the initial premises are incorrect or incomplete. Here are some examples of deductive reasoning: If all men are mortal and Socrates is a man, then Socrates is mortal. If a company policy states that all employees must undergo a probation period and John is a new employee, then John must undergo a probation period. If all sales above \$1000 earn a 10% commission and a salesperson makes a \$2000 sale, then the salesperson earns a \$200 commission. In the HR context, an example could be applying company policies and job requirements to evaluate candidates. While deductive reasoning provides a solid foundation for decision-making, it's important to ensure that the initial premises are accurate and comprehensive. Inductive and deductive reasoning are two sides of the same coin, each with its strengths and limitations. Inductive reasoning is more open-ended and exploratory, allowing for the formation of new hypotheses and creative solutions. However, it can be prone to bias due to its reliance on observational data. On the other hand, deductive reasoning is more focused and provides a solid foundation for decision-making. It guarantees the truth of the conclusion if the premises are true. However, its effectiveness can be limited if the initial premises are incorrect or incomplete. Both inductive and deductive reasoning play crucial roles in decision making. Inductive reasoning helps in recognizing patterns and trends, leading to new insights and innovative solutions. It's particularly useful in areas like marketing strategy and candidate evaluation. Deductive reasoning, on the other hand, ensures compliance and consistency. It's essential in areas that require a logical structure and sequence, such as policy application and risk assessment. In essence, a well-rounded approach to problem-solving involves using both types of reasoning in a complementary manner. Inductive and deductive reasoning are not just theoretical concepts. They have practical applications in various fields, including HR and recruitment. Understanding these reasoning methods can help HR managers improve their hiring processes and make more informed decisions. Inductive reasoning can be particularly useful in candidate evaluation. By observing a candidate's behavior during interviews, HR managers can make generalizations about their potential performance. This can lead to more accurate predictions and better hiring decisions. Deductive reasoning, on the other hand, is crucial in policy application. HR managers can start with the general company policies and job requirements, and apply them to specific candidate evaluations. This ensures consistency and fairness in the hiring process. Improving reasoning skills can significantly enhance the effectiveness of HR professionals. It can lead to better decision-making, more accurate candidate evaluations, and more strategic HR practices. To strengthen inductive reasoning, HR professionals should practice being observant and open to new information. Recognizing patterns and trends can help in making accurate generalizations and predictions. For deductive reasoning, practicing puzzles and logical problems can be beneficial. It helps in understanding the logical structure and sequence, which is crucial in deductive reasoning. Understanding and applying both inductive and deductive reasoning can significantly improve the recruitment process. It leads to more accurate candidate evaluations and strategic decision-making. HR managers are encouraged to seek resources and training to enhance their reasoning skills. This will lead to better hiring outcomes and a more effective HR practice. Inductive and deductive are commonly used in the context of logic, reasoning, and science. Scientists use both inductive and deductive reasoning as part of the scientific method. Fictional detectives like Sherlock Holmes are famously associated with methods of deduction (though that's often not what Holmes actually uses—more on that later). Some writing courses involve inductive and deductive essays. But what's the difference between inductive and deductive? Broadly speaking, the difference involves whether the reasoning moves from the general to the specific or from the specific to the general. In this article, we'll define each word in simple terms, provide several examples, and even quiz you on whether you can spot the difference. Inductive reasoning (also called induction) involves forming general theories from specific observations. Observing something happen repeatedly and concluding that it will happen again in the same way is an example of inductive reasoning. Deductive reasoning (also called deduction) involves forming specific conclusions from general premises, as in: everyone in this class is an English major; Jesse is in this class; therefore, Jesse is an English major. What does inductive mean? Inductive is used to describe reasoning that involves using specific observations, such as observed patterns, to make a general conclusion. This method is sometimes called induction. Induction starts with a set of premises, based mainly on experience or experimental evidence. It uses those premises to generalize a conclusion. For example, let's say you go to a cafe every day for a month, and every day, the same person comes at exactly 11 am and orders a cappuccino. The specific observation is that this person has come to the cafe at the same time and ordered the same thing every day during the period observed. A general conclusion drawn from these premises could be that this person always comes to the cafe at the same time and orders the same thing. While inductive reasoning can be useful, it's prone to being flawed. That's because conclusions drawn using induction go beyond the information contained in the premises. An inductive argument may be highly probable, but even if all the observations are accurate, it can lead to incorrect conclusions. Follow up this discussion with a look at concurrent vs. consecutive. In our basic example, there are a number of reasons why it may not be true that the person always comes at the same time and orders the same thing. Additional observations of the same event happening in the same way increase the probability that the event will happen again in the same way, but you can never be completely certain that it will always continue to happen in the same way. That's why a theory reached via inductive reasoning should always be tested to see if it is correct or makes sense. What else does inductive mean? Inductive can also be used as a synonym for introductory. It's also used in a more specific way to describe the scientific processes of electromagnetic and electrostatic induction—or things that function based on them. What does deductive mean? Deductive reasoning (also called deduction) involves starting from a set of general premises and then drawing a specific conclusion that contains no more information than the premises themselves. Deductive reasoning is sometimes called deduction (note that deduction has other meanings in the contexts of mathematics and accounting). Here's an example of deductive reasoning: chickens are birds; all birds lay eggs; therefore, chickens lay eggs. Another way to think of it: if something is true of a general class (birds), then it is true of the members of the class (chickens). Deductive reasoning can go wrong, of course, when you start with incorrect premises. For example, look where this first incorrect statement leads us: all animals that lay eggs are birds; snakes lay eggs; therefore, snakes are birds. The scientific method can be described as deductive. You first formulate a hypothesis—an educated guess based on general premises (sometimes formed by inductive methods). Then you test the hypothesis with an experiment. Based on the results of the experiment, you can make a specific conclusion as to the accuracy of your hypothesis. You may have deduced there are related terms to this topic. Start with a look at interpolation vs. extrapolation. Deductive reasoning is popularly associated with detectives and solving mysteries. Most famously, Sherlock Holmes claimed to be among the world's foremost practitioners of deduction, using it to solve how crimes had been committed (or impress people by guessing where they had been earlier in the day). However, despite this association, reasoning that's referred to as deduction in many stories is actually more like induction or a form of reasoning known as abduction, in which probable but uncertain conclusions are drawn based on known information. Sherlock's (and Arthur Conan Doyle's) use of the word deduction can instead be interpreted as a way (albeit imprecise) of referring to systematic reasoning in general. What is the difference between inductive vs. deductive reasoning? Inductive reasoning involves starting from specific premises and forming a general conclusion, while deductive reasoning involves using general premises to form a specific conclusion. Conclusions reached via deductive reasoning cannot be incorrect if the premises are true. That's because the conclusion doesn't contain information that's not in the premises. Unlike deductive reasoning, though, a conclusion reached via inductive reasoning goes beyond the information contained within the premises—it's a generalization, and generalizations aren't always accurate. The best way to understand the difference between inductive and deductive reasoning is probably through examples. Premise: All known fish species in this genus have yellow fins. Conclusion: Any newly discovered species in the genus is likely to have yellow fins. Premises: This volcano has erupted about every 500 years for the last 1 million years. It last erupted 499 years ago. Conclusion: It will erupt again soon. Examples of deductive reasoning Premises: All plants with rainbow berries are poisonous. This plant has rainbow berries. Conclusion: This plant is poisonous. Premises: I am lactose intolerant. Lactose intolerant people get sick when they consume dairy. This milkshake contains dairy. Conclusion: I will get sick if I drink this milkshake. Have you enjoyed detective shows? You may have noticed how detectives analyze evidence to identify suspects, using logical reasoning. In science, we also use logical reasoning to explain natural phenomena. So, what's the contrast between deductive and inductive reasoning? Read on to discover the key differences.Scientists Use Logical ReasoningScientists utilize careful planning, creative thought, and logical deduction to explore and understand natural occurrences. The scientific method encompasses several steps, including observation, problem identification, hypothesis formulation, experimental testing, and concluding.These findings are then communicated within the scientific community, with hypotheses that withstand testing potentially evolving into theories. Logical reasoning plays a crucial role throughout this process, guiding scientists in their quest for knowledge and understanding.Through rigorous experimentation and analysis, scientists aim to uncover the underlying mechanisms behind natural phenomena. As data is collected and theories refined, the scientific community collectively advances its understanding of the world.Logical reasoning serves as the backbone of scientific inquiry, facilitating the formulation of hypotheses, interpretation of results, and refinement of theories over time.READ ALSO: How To Tell Time Without Using ClocksDeductive Vs. Inductive ReasoningThere are two different types of logical reasoning, namely deductive and inductive reasoning.Deductive ReasoningDeductive reasoning, or deduction, relies on general principles to derive specific conclusions. When the premise is true-such as "all spiders have eight legs"-deductive reasoning leads to valid conclusions. For instance, because tarantulas belong to the spider family, deducing that they also possess eight legs is logical.In the scientific method, deduction is crucial for testing hypotheses and theories, which make predictions based on established principles. Sylvia Wassertheil-Smoller, a researcher at Albert Einstein College of Medicine, explains that scientists move from theories to observations, building upon existing knowledge to formulate hypotheses and theories, which are then subjected to empirical testing.Deductive reasoning typically follows a structured format, often employing syllogisms where two premises-major and minor-lead to a logical conclusion.However, the reliability of deductive conclusions hinges on the accuracy of the premises; if the premises are false, the deductions will be inaccurate, as demonstrated by examples like "All bald men are grandfathers. Harold is bald. Therefore, Harold is a grandfather."Inductive ReasoningInductive reasoning, also known as inductive logic or inference, extrapolates general conclusions from specific observations. Unlike deductive reasoning, which starts from a general premise to arrive at a specific conclusion, inductive reasoning operates in reverse, building hypotheses from observed patterns.In science, researchers employ both inductive and deductive reasoning to gradually approach verifiable truths. Inductive reasoning involves making numerous observations, identifying patterns, and formulating generalizations or theories.However, the reliability of conclusions drawn through inductive reasoning depends on the comprehensiveness of the observations; for example, inferring that all coins in a bag are pennies based on a few observations may not hold if additional coins turn out to be different denominations.Despite its potential limitations, inductive reasoning plays a crucial role in the scientific method by generating hypotheses and theories. Scientists then use deductive reasoning to apply these theories to specific contexts, ensuring a systematic approach to scientific inquiry. RELATED ARTICLE: Basic Logic Help Monkeys in Decision Making, According to StudyCheck out more news and information on Human Behavior in Science Times. Whether you realize it or not, you make about a gazillion decisions a day.Do you need a coat today? What should you make for dinner? How should you respond to that text message? Does it even need a response?Thankfully, our brains are problem-solving machines. They take in information, store it and use it later to help you make (mostly) reasonable decisions. Over and over and over again. All day. Every day.Our brains come to decisions using several different forms of logic, including two of the most well-known types of reasoning: inductive and deductive. They're thought patterns that help us make sense of the world and take action accordingly.But it's not always a perfect system. Because we humans aren't perfect beings (though the perfectionists among us may not like to admit it).What's the difference between inductive vs. deductive reasoning? And what do they have to do with your well-being?Health psychologist Grace Tworek, PsyD, explains the ways our reasoning can lead us to some less-than-reasonable conclusions.Inductive vs. deductive reasoningLogic and reasoning are core parts of the human experience. And how people make decisions and come to conclusions are complex and individualized processes.Some experts describe a handful of different types of reasonings. Others theorize there are dozens of ways that people come to make decisions.Two of the most basic forms of reasoning are inductive and deductive. And they can play a big part in constructing your worldview and influencing the choices you make.What's the difference between inductive and deductive reasoning? At their core:Inductive reasoning: Allows you to reach a conclusion based on a specific observation.Deductive reasoning: Allows you to reach a conclusion based on a generalized premise.We all use inductive and deductive reasoning all the time. There's nothing "wrong" with either. Neither is "better" than the other.But when your reasoning is based on shaky foundations, your conclusions are more likely to lead you to less-than-fully-formed decisions. And that can impact your physical and mental well-being.Let's look at some examples to better understand inductive and deductive reasoning.How inductive reasoning worksConclusion based on a specific observation."When you use inductive reasoning, you're essentially making an educated guess," Dr. Tworek shares. "You're using your past experiences and knowledge to predict what's likely to happen and take action based on that prediction."Consider these examples:Observation: The weather app says it's going to be 20 degrees Fahrenheit (-7 degrees Celsius) today.Reasoning: I've experienced that temperature before. I know that's cold.Conclusion: I'll wear a coat today to keep comfortable. Observation: My phone bill is due today.Reasoning: Last time I didn't pay the bill on time, I had to pay a late fee. Conclusion: I'm going to pay the bill right now so I don't have to pay extra.Observation: I have an appointment tomorrow at 9 a.m. across town.Reasoning: I've driven that way at that time before and the traffic is heavy.Conclusion: I'll leave early so I won't be late.In each example, there's a problem to be solved. You have experience with that problem. And inductive reasoning helped to use that experience to reach a well-thought-out solution.Inductive reasoning downsidesBut there can be a downside when your brain gets ... overzealous, so to speak, with inductive reasoning. That is, it can lead to you making decisions even when you don't have enough information to reach a fully reasonable conclusion.For example:If you got bit by a dog, inductive reasoning could lead you to the conclusion that dogs are vicious and should be avoided. Probably an overreaction.If you had a lucky roll at the craps table, inductive reasoning could keep you throwing those dice longer. A recipe for big losses.If your kid and their friends go for an ill-advised helmet-free bike ride. No one gets hurt (thankfully). But they come to the conclusion that you're being overprotective when you insist they wear proper head protection. In reality, they don't know the dangers like you do because they're working from limited experience."Your worldview can become impacted when we follow theories based off of our own specific experiences," Dr. Tworek notes. "Someone who has the tendency to have positive takeaways from experiences may go into new experiences anticipating a positive outcome — a glass-half-full perspective. And vice versa. Negative experiences can lead to a mindset where poor outcomes are what's expected."How deductive reasoning worksConclusion based on a generalized premise.When you use deductive reasoning, you start with a big-picture idea and then reason out a conclusion based on that framework."Deductive reasoning is almost like building with blocks," Dr. Tworek illustrates. "You have the beginnings of a structure built with blocks — a premise. So, you rationalize when another block belongs within that structure."Consider these examples:Observation: I'm going to visit a friend in Seattle.Premise: It rains a lot in Seattle.Conclusion: It's going to rain while I'm there. I'll pack an umbrella.Observation: This ice cream has dairy.Premise: Dairy upset my stomach.Conclusion: This ice cream will give me a stomachache. I'm not going to eat it.Observation: I'm running low on clean underwear.Premise: I need to do laundry to have clean clothes.Conclusion: It's time to do laundry.Like inductive reasoning, deductive reasoning isn't something you necessarily realize you're doing. Because your brain is moving rapid-fire to assess the situation at hand and offer up a solution.Deductive reasoning downsidesRelying on deductive reasoning in the wrong situations or applying a not-fully-formed premise to a situation at hand can lead to forming conclusions that don't serve you well."Maybe you made a mistake on a challenging project at work and received negative feedback from your manager," Dr. Tworek poses. "Now, you're beginning a new project and feel challenged again. But the feedback from that other project has led you to believe that you don't have the skills to complete this project, even if that's not accurate. You conclude that you won't do a good job on the task at hand, based on the (likely wrong) premise that you're not good at your job."What to do about unhealthy reasoningIt's only natural that you'll use inductive and deductive reasoning (and other thought processes) day in and day out. Your brain is constantly in motion as you make decisions.But the conclusions you come to don't have to be on autopilot. Because, left unchecked, our reasoning isn't always going to benefit us."There are times when our reasoning processes can make you feel limited, or it can perpetuate negative self-talk — meaning that you find you are not speaking kindly to yourself, or are even limiting yourself — as a result of the reasoning you are using," Dr. Tworek shares.Pausing to consider how you're reacting to situations or why you've come to certain decisions can help you stop unhealthy thought patterns from taking over."Perhaps we were taught growing up that we can't draw conclusions based on our own experiences, but that we must gather a large amount of information before coming to an answer. Or maybe we were raised in a way where one person's experience created a set of rules or guidelines to follow," she points out. "That can impact the types of reasoning that we default to and the situations that we use them in."What's more, certain health conditions can affect your ability to reason logically. That includes ones like ADHD, brain tumors, mental health disorders and sleep disorders.Recognizing unhealthy reasoning in yourself and reconsidering the premises that it's based on can be tough. After all, they're your thoughts. Your experiences. They live in your mind. So, it can be a challenge to step out of that construct. Regardless of how unhelpful that reasoning process actually is.Engaging with a mental health professional can help. Because an outside perspective can help challenge unhealthy premises and help you find new strategies that can serve you better."A licensed mental health professional can assist in identifying thought patterns, understanding how we may be drawing certain conclusions or using certain methods of reasoning, and providing appropriate interventions," Dr. Tworek reassures. The process of thinking about something, in a rational manner, so as to draw valid conclusions, is known as Reasoning. It is a daily activity that we use to make decisions, which involves the construction of thoughts and converting them into a proposition to give reasons on why we have opted for a particular alternative over the other.Reasoning (logic) can take two forms – inductive reasoning or deductive reasoning. The inductive reasoning follows a particular flow or behaviour so as to make inferences Conversely, deductive reasoning uses available information, facts or premises to arrive at a conclusion. These two logics are exactly opposite to each other. Still, they are often juxtaposed due to lack of adequate information. In this article, we are going to tell you the basic differences between inductive and deductive reasoning, which will help you to understand them better. Content: Inductive Reasoning Vs Deductive Reasoning Comparison Chart Definition Key Differences Video Conclusion Comparison Chart Basis for ComparisonInductive ReasoningDeductive Reasoning MeaningInductive Reasoning connotes the argument in which the premises give reasons in support of the probable truth of the conjecture.Deductive reasoning is the fundamental form of valid reasoning, wherein the premises give guarantee of the truth of conjecture. ApproachBottom-up approachTop-down approach Starting pointConclusionPremises Based onPatterns or trendFacts, truths and rules ProcessObservation > Pattern > Tentative Hypothesis > TheoryTheory > Hypothesis > Observation > Confirmation ArgumentMay or may not be strong.May or may not be valid. StructureGoes from specific to generalGoes from general to specific Draws inferences withProbabilityCertainity Definition of Inductive Reasoning In research, inductive reasoning alludes to the logical process, in which specific instances or situations are observed or analysed to establish general principles. In this process, the multiple propositions are believed to provide strong evidence, for the truth of the conclusion. It is used to develop an understanding, on the basis of observing regularities, to ascertain how something works. These are uncertain arguments; that describes the extent to which the conclusions drawn on the basis of premises, are credible. In inductive reasoning, there are certain possibilities that the conclusion drawn can be false, even if the all the assumptions are true. The reasoning vests on experience and observations that support the apparent truth of the conclusion. Further, the argument can be strong or weak, as it only describes the likelihood of the inference, to be true. Definition of Deductive Reasoning Deductive Reasoning means a form of logic in which specific inferences are drawn from multiple premises (general statements). It establishes the relationship between the proposition and conclusion. When all the proposed statements are true, then the rules of deduction are applied and the result obtained is inevitably true. Deductive logic is based on the fundamental law of reasoning, i.e. if X then Y. It implies the direct application of available information or facts, to come up with new information or facts. In this, the researcher takes into account a theory and generates a hypothesis, which can be tested, after that the observation are recorded, which leads to particular data, which is nothing but the confirmation of validity. The points provided below, clarifies the difference between inductive and deductive reasoning in detail: The argument in which the premises give reasons in support of the probable truth of the conjecture is inductive reasoning. The elementary form of valid reasoning, wherein the proposition provide the guarantee of the truth of conjecture, is deductive reasoning. While inductive reasoning uses the bottom-up approach, deductive reasoning uses a top-down approach. The initial point of inductive reasoning is the conclusion. On the other hand, deductive reasoning starts with premises. The basis of inductive reasoning is behaviour or pattern. Conversely, deductive reasoning depends on facts and rules. Inductive reasoning begins with a small observation, that determines the pattern and develops a theory by working on related issues and establish the hypothesis. In contrast, deductive reasoning begins with a general statement, i.e. theory which is turned to the hypothesis, and then some evidence or observations are examined to reach the final conclusion. In inductive reasoning, the argument supporting the conclusion, may or may not be strong. On the contrary, in deductive reasoning, the argument can be proved valid or invalid. Inductive reasoning moves from specific to general. Unlike, deductive reasoning moves from general to particular. In inductive reasoning, the inferences drawn are probabilistic. As opposed, in deductive reasoning, the generalisation made are necessarily true, if the premises are correct. Video: Inductive Vs Deductive Reasoning Conclusion To sum up, inductive and deductive reasoning are the two kinds of logic, which are used in the field of research to develop the hypothesis, so as to arrive at a conclusion, on the basis of information, which is believed to be true. Inductive reasoning considers events for making the generalization. In contrast, deductive reasoning takes general statements as a base to arrive at an particular conclusion. Inductive and deductive are commonly used in the context of logic, reasoning, and science. Scientists use both inductive and deductive reasoning as part of the scientific method. Fictional detectives like Sherlock Holmes are famously associated with methods of deduction (though that's often not what Holmes actually uses—more on that later). Some writing courses involve inductive and deductive essays. But what's the difference between inductive and deductive? Broadly speaking, the difference involves whether the reasoning moves from the general to the specific or from the specific to the general. In this article, we'll define each word in simple terms, provide several examples, and even quiz you on whether you can spot the difference. Inductive reasoning (also called induction) involves forming general theories from specific observations. Observing something happen repeatedly and concluding that it will happen again in the same way is an example of inductive reasoning. Deductive reasoning (also called deduction) involves forming specific conclusions from general premises, as in: everyone in this class is an English major; Jesse is in this class; therefore, Jesse is an English major. What does inductive mean? Inductive is used to describe reasoning that involves using specific observations, such as observed patterns, to make a general conclusion. This method is sometimes called induction. Induction starts with a set of premises, based mainly on experience or experimental evidence. It uses those premises to generalize a conclusion. For example, let's say you go to a cafe every day for a month, and every day, the same person comes at exactly 11 am and orders a cappuccino. The specific observation is that this person has come to the cafe at the same time and ordered the same thing every day during the period observed. A general conclusion drawn from these premises could be that this person always comes to the cafe at the same time and orders the same thing. While inductive reasoning can be useful, it's prone to being flawed. That's because conclusions drawn using induction go beyond the information contained in the premises. An inductive argument may be highly probable, but even if all the observations are accurate, it can lead to incorrect conclusions. Follow up this discussion with a look at concurrent vs. consecutive. In our basic example, there are a number of reasons why it may not be true that the person always comes at the same time and orders the same thing. Additional observations of the same event happening in the same way increase the probability that the event will happen again in the same way, but you can never be completely certain that it will always continue to happen in the same way. That's why a theory reached via inductive reasoning should always be tested to see if it is correct or makes sense. What else does inductive mean? Inductive can also be used as a synonym for introductory. It's also used in a more specific way to describe the scientific processes of electromagnetic and electrostatic induction—or things that function based on them. What does deductive mean? Deductive reasoning (also called deduction) involves starting from a set of general premises and then drawing a specific conclusion that contains no more information than the premises themselves. Deductive reasoning is sometimes called deduction (note that deduction has other meanings in the contexts of mathematics and accounting). Here's an example of deductive reasoning: chickens are birds; all birds lay eggs; therefore, chickens lay eggs. Another way to think of it: if something is true of a general class (birds), then it is true of the members of the class (chickens). Deductive reasoning can go wrong, of course, when you start with incorrect premises. For example, look where this first incorrect statement leads us: all animals that lay eggs are birds; snakes lay eggs; therefore, snakes are birds. The scientific method can be described as deductive. You first formulate a hypothesis—an educated guess based on general premises (sometimes formed by inductive methods). Then you test the hypothesis with an experiment. Based on the results of the experiment, you can make a specific conclusion as to the accuracy of your hypothesis. You may have deduced there are related terms to this topic. Start with a look at interpolation vs. extrapolation. Deductive reasoning is popularly associated with detectives and solving mysteries. Most famously, Sherlock Holmes claimed to be among the world's foremost practitioners of deduction, using it to solve how crimes had been committed (or impress people by guessing where they had been earlier in the day). However, despite this association, reasoning that's referred to as deduction in many stories is actually more like induction or a form of reasoning known as abduction, in which probable but uncertain conclusions are drawn based on known information. Sherlock's (and Arthur Conan Doyle's) use of the word deduction can instead be interpreted as a way (albeit imprecise) of referring to systematic reasoning in general. What is the difference between inductive vs. deductive reasoning? Inductive reasoning involves starting from specific premises and forming a general conclusion, while deductive reasoning involves using general premises to form a specific conclusion. Conclusions reached via deductive reasoning cannot be incorrect if the premises are true. That's because the conclusion doesn't contain information that's not in the premises. Unlike deductive reasoning, though, a conclusion reached via inductive reasoning goes beyond the information contained within the premises—it's a generalization, and generalizations aren't always accurate. The best way to understand the difference between inductive and deductive reasoning is probably through examples. Premise: All known fish species in this genus have yellow fins. Conclusion: Any newly discovered species in the genus is likely to have yellow fins. Premises: This volcano has erupted about every 500 years for the last 1 million years. It last erupted 499 years ago. Conclusion: It will erupt again soon. Examples of deductive reasoning Premises: All plants with rainbow berries are poisonous. This plant has rainbow berries. Conclusion: This plant is poisonous. Premises: I am lactose intolerant. Lactose intolerant people get sick when they consume dairy. This milkshake contains dairy. Conclusion: I will get sick if I drink this milkshake.