

Welcome to Dave Penner's Presentation on Inductive Reasoning!

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2. What is Inductive Reasoning Good For?
3. What is the difference between Deductive and Inductive Reasoning?
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What is Inductive Reasoning?

Oxford Dictionary:

‘Inductive’ is “leading on (*to* some action, etc.); inducing.”

‘Reasoning’ is the process of arriving at conclusions from evidence.

Therefore,

‘Inductive Reasoning’ is “reasoning from particular facts [leading] to general principles.”

Let's Use Inductive Reasoning!

She has red hair;

therefore...

Let's Use Inductive Reasoning!

She has red hair;

therefore...

she has a temper.



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GREAT !



Kant asks:

“How is it [someone] can observe one fact and straightaway pronounce judgment concerning another different fact not involved in the first?”



Nicholas Rescher asks:

“What sorts of considerations validate our reliance on induction as a method for reasoning in building up our knowledge of the ways of the world?”

We Need to Fill in the Gaps!



Induction is an instrument of inquiry; it affords a mechanism for arriving at our “best available estimate” of the correct answer.

How about this - Where there is smoke...

Induction is an instrument of inquiry; it affords a mechanism for arriving at our “best available estimate” of the correct answer.

How about this - Where there is smoke...

There is a smoke flare.



In Inductive Reasoning, we don't assert that something is true; it is probably more true than not.

The larger the number of specific instances, the more certain is the generalization.

The greater the probability, the greater the acceptance and life of the conclusion.

Try to find the best possible answer!

The aim is to *secure* information about the world.

Game:

Using induction, find the *plausibilistically optimal* alternative

Three detectives are trying to figure out an illegible message scrawled in English.

They cannot make out the the first letter of the three letter word, “_AN.”

The first detective thinks the letter is an ‘O’.

The second thinks the letter is a ‘Q’.

The third thinks it is a ‘G’.

What is the letter?



Game:

Using induction, find the *plausibilistically optimal* alternative

Three detectives are trying to figure out an illegible message scrawled in English.

They cannot make out the the first letter of the three letter word, “CAN.”

The first detective thinks the letter is an ‘O’.

The second thinks the letter is a ‘Q’.

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**THE ANSWER
IS ‘C’ !!!**

What is the letter?

Inductive Reasoning Exercise:

2. Which of the following would be the strongest argument for the claim, "The weather for tomorrow will be beautiful"?

John says, "Tomorrow is my birthday, and the weather on my birthday is always beautiful."

Paul says, "The weather forecast in the newspaper is always wrong, and tomorrow's forecast is for rain, so it will probably be beautiful."

George says, "The weather forecast in the newspaper is always right, and tomorrow's forecast is for a beautiful day, so that's what it will be."

Craig says, "The barometric pressure has been rising for three days, and whenever that happens we have beautiful weather for the next week, so tomorrow is sure to be beautiful."

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

Deductive:

- The premises entail, or demonstrate the conclusion.
- If the premises are true, the conclusion cannot be false.
- All birds can fly. A crow is a bird. Therefore, a crow can fly.

Inductive:

- The premises only 'support,' but do not entail the conclusion, so that there is no contradiction between the evidence being true and the conclusion being false.
- If the premises are true, it is still possible for the conclusion to be false.
- All observed crows are black. Therefore, all crows are black.

How Can We Use Inductive Reasoning?

There are many different types of
Inductive Reasoning

Generalization

Statistical Syllogism

Simple induction

Inductive Analogy

Prediction

Argument from Authority

Generalization

A generalization, or an *inductive generalization*, proceeds from a premise about a sample to a conclusion about the population.

1. A proportion Q of the sample has attribute A .
2. Conclusion: Q of the population has A .

The support which the premises provide for the conclusion is dependent on the number of individuals in the sample group, and the randomness of the sample.

Statistical syllogism

Proceeds from a generalization to a conclusion about an individual.

1. A proportion Q of population P has attribute A .
2. An individual I is a member of P .
3. Conclusion: There is a probability which corresponds to Q that I has A .

Simple induction

This is a combination of a generalization and a statistical syllogism.

This proceeds from a premise about a sample group to a conclusion about another individual.

1. Proportion Q of known instances of population P has attribute A .
2. Individual I is another member of P .
3. Conclusion: There is a probability which corresponds to Q that I has A .

Inductive Analogy

This proceeds from known similarities between two things to a conclusion about an additional attribute that is common to both things:

1. P is similar to Q.
2. P has attribute A.
3. Conclusion: Q has attribute A.

Prediction

A prediction draws a conclusion about the future from a past sample.

1. Proportion Q of observed members of group G have had attribute A .
2. There is a probability which corresponds to Q that the next observed member of G will have A .

Argument from Authority

An argument from authority draws a conclusion about the truth of a statement based on the proportion of true propositions which a source says.

It has the same form as a prediction.

1. Proportion Q of the claims of authority A have been true.
2. There is a probability which corresponds to Q that this claim of A is true.

Test

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This sample is biased, because homeowners are a group of the population who might be expected to have special views on welfare.

Test

2.

The University of Western Ontario did a study on the well being of 93 coronary patients. Slightly more than 50% of the patients had pets (dogs, cats, fish, and 1 iguana).

After one year, a third of the patients without pets died, while only 3 of the animal owners died.

The scientists concluded that pet ownership may have a positive effect on the health of humans.

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Although the sample is small, the conclusion is weak. Therefore, the conclusion is not fallacious. More background about the health of the patients would be useful.

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This is an illegitimate appeal because of the disagreement among "experts" on the morality of abortion.

The End

Thanks for Listening!