INDUCTIVE LOGIC AND CAUSAL CONNECTION

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THE SYLLABUS

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f) Causal Connections: Cause and Effect, the meaning of "Cause"; Induction by Simple Enumeration.

INDUCTIVE LOGIC

- Inductive logic deals with inductive arguments
- Arguments are traditionally divided into two different types: deductive and inductive
- An inductive argument is one whose conclusion is claimed to follow from its premisses only with probability, this probability being a matter of degree
- An inductive argument claims that its premisses give only some degree of probability, but not certainty, to its conclusion

EXAMPLES OF INDUCTIVE ARGUMENT

- Ram is human and mortal
  Shyam is human and mortal
  Jadu is human and mortal
  Madhu is human and mortal
  Therefore, probably all humans are mortal

- All cows are mammals and have lungs
  All humans are mammals and have lungs
  All whales are mammals
  Therefore, all whales probably have lungs

INDUCTION BY SIMPLE ENUMERATION

- In case of induction the method of arriving at general or universal conclusion from the particular facts of experience is called inductive generalization or induction by simple enumeration
- Here we come to "all" in the conclusion from "some" in the premisses
- Here the premisses are instances in which phenomena of two kinds repeatedly accompany one another in certain circumstances and then it is concluded that phenomena of those two kinds always accompany one another in such circumstances

EXAMPLE OF INDUCTION BY SIMPLE ENUMERATION

An inductive generalization of the form

Instance 1 of phenomenon E is accompanied by circumstance C

Instance 2 of phenomenon E is accompanied by circumstance C

Instance 3 of phenomenon E is accompanied by circumstance C

Therefore, every instance of phenomenon E is accompanied by circumstance C

is an induction by simple enumeration

DISTINCTION BETWEEN DEDUCTION AND INDUCTION

- In deductive argument, the conclusion is claimed to follow from its premisses with absolute certainty, while in inductive argument, the conclusion is claimed to follow from its premisses with some degree of probability

- A deductive argument can be valid or invalid while the terms “validity” or “invalidity” do not apply to inductive arguments, i.e., a inductive argument can only be probable

- In deduction we conclude “some” from “all” while in induction we jump to “all” from “some”

CAUSAL CONNECTION

- We enter the heart of inductive logic with an exploration of the meanings of “cause” and “effect”
- Events do not just happen, but occur only under certain conditions
- In inductive reasoning, some effect is inferred from what is assumed to be its cause, or some cause is inferred from what is assumed to be its effect
- In order to understand the term “cause” it is required to grasp the notions of necessary and sufficient condition

THE MEANING OF "CAUSE"

- There is no single definition of cause. There are different senses of the term "**cause**"
- A **necessary condition** for the occurrence of a specified event is a circumstance in whose absence the event can not occur
- A **sufficient condition** for the occurrence of an event is a circumstance in whose presence the event must occur
- We can legitimately infer cause from effect only in the sense of necessary condition, and we can legitimately infer effect from cause only in the sense of sufficient condition

CAUSE (CONTD…)

- In certain practical situations, the word “cause” is used in still a different sense

- Where inferences are made both from cause to effect and from effect to cause, the term “**cause**” must be used in the sense of “**necessary and sufficient condition**”

- In this usage, cause is identified with sufficient condition, and sufficient condition is regarded as the conjunction of all necessary conditions.

SOURCE:

- Irving M. Copi and Carl Cohen, *Introduction to Logic* (9th edition), Prentice Hall of India Pvt Ltd, New Delhi, 1995

THANK YOU

Any query regarding the topic
is always welcome