

## Philosophy 12: Introduction to Causal Reasoning

### Study questions for Lecture 3: “Determinism and Indeterminism”

For questions 1 through 3, consider the following table which represents a response structure with two causal factors:

Assignment	CAUSAL FACTOR 1	CAUSAL FACTOR 2	EFFECT
1	Yes	Yes	Yes
2	Yes	No	Yes
3	No	Yes	No
4	No	No	No

1. If we could observe only CAUSAL FACTOR 1, would the response structure appear deterministic or indeterministic?
  - (a) Deterministic
  - (b) Indeterministic
  - (c) Not enough information
2. If we could observe only CAUSAL FACTOR 2, would the response structure appear deterministic or indeterministic?
  - (a) Deterministic
  - (b) Indeterministic
  - (c) Not enough information

For questions 3 through 4, consider the following response structure for the effect LUNG CANCER from the causes EXPOSED TO ASBESTOS and HAS GENE 117.

3. Is this response structure deterministic?
  - (a) Yes
  - (b) No
4. Suppose, however, that we cannot observe gene 117, but we can observe asbestos exposure. Is the response structure with just EXPOSED TO ASBESTOS deterministic or indeterministic?
  - (a) Deterministic
  - (b) Indeterministic
  - (c) Not enough information
5. Now suppose that we cannot observe whether someone has been exposed to asbestos but that we can observe whether someone has gene 117. Is the resulting response structure with just HAS GENE 117 deterministic or indeterministic?
  - (a) Deterministic
  - (b) Indeterministic
  - (c) Not enough information

6. For which of the following reasons can causation appear to be indeterministic in a population?
- (a) The population is response structure uniform, but each individual in the population has an indeterministic response structure.
  - (b) The population is not response structure uniform.
  - (c) Each individual in the population has a deterministic response structure, and the population is response structure uniform, but not all causal assignments are observed.
  - (d) Each individual in the population has a deterministic response structure, but the population is not response structure uniform.
  - (e) None of the above.
7. Consider a causal system involving two variables: INCOME [High, Low] and HEALTH [Poor, Good]. Suppose you did an experiment on a population of 10 individuals. For the first five individuals, you assigned them low income, and for the second five individuals you assigned them high income. You then waited a few months, observed their health, and recorded it as good or poor. Amazingly, everyone assigned to low income had poor health, and everyone assigned to high income had good health. Which of the following can we conclude from this experiment?
- (a) The population is response structure uniform.
  - (b) Every individual has a deterministic response structure.
  - (c) None of the above.

8. In the following response structure, which are the direct indeterministic causes?

Causal Assignment	FLU SHOT	AVERAGE SLEEP PER NIGHT	AVOIDED FLU
1	Yes	Over 8 hours	90%
2	Yes	Under 8 hours	50%
3	No	Over 8 hours	20%
4	No	Under 8 hours	10%

- (a) Only flu shot
  - (b) Only amount of sleep
  - (c) Both flu shot and amount of sleep
  - (d) Neither flu shot nor amount of sleep
9. Consider the following response structure:

Causal Assignment	OIL CHANGE FREQUENCY	GAS GRADE	ENGINE LASTS OVER 100,000 MILES
1	High	Premium	34%
2	High	Regular	34%
3	Low	Premium	1%
4	Low	Regular	1%

In this response structure, which are indeterministic causes of an engine lasting over 100,000 miles?

- (a) FREQUENCY OF OIL CHANGE
- (b) GAS GRADE
- (c) Neither FREQUENCY OF OIL CHANGE nor GAS GRADE

10. Leaving your common sense behind, which of the following are direct indeterministic causes of HEART DISEASE, according to this indeterministic response structure?

Causal Assignment	REGULAR EXERCISE	LOW FAT DIET	PRACTICES STRESS REDUCTION	HEART DISEASE
1	Yes	Yes	Yes	30%
2	Yes	Yes	No	50%
3	Yes	No	Yes	30%
4	Yes	No	No	50%
5	No	Yes	Yes	50%
6	No	Yes	No	60%
7	No	No	Yes	50%
8	No	No	No	60%

- (a) REGULAR EXERCISE
- (b) LOW FAT DIET
- (c) PRACTICES STRESS REDUCTION
- (d) None of the above