

## Free Will versus Determinism

### Determinism:

- e.g., David Hume (1711 – 1776)
- All physical events are determined by the sum total of all prior events.
- Our actions are physical events and must therefore also be determined by previous events.
- For example, you saw a food advertisement on TV and then went to the refrigerator.
- According to determinism, this action was inevitable.
- “Billiard balls:” actions are determined, replicable, and predictable by forces being applied.

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

1

## Free Will versus Determinism

- If we apply this to human behavior, it means that we can predict every action a person will ever take.
- However, we would need a complete understanding of the system (the brain) and the forces acting on it.
- This theory turns humans into “automatons.”
- If this is true, then there is no actual free will.

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

2

## Free Will

### Entity model of causation:

- Ayn Rand (1963)
- Entities (objects capable of independent action) with specific identities cause actions.
- Actions are determined by the nature of an entity, not by prior forces.
- Entities act within the limits set by their nature.
- If we decide to think, we can consciously control our actions.

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

3

## Free Will

### Problem with free will:

- The scientific view demands that all events have a cause.
- If there is completely free will, then the resulting action of such free will had somehow caused itself.
- In the cognitive science view, decision making is a mental process.
- It receives information as input, performs some kind of computation, and outputs new information or behavior.

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

4

## Free Will

- Information is continually obtained and processed, and therefore no decision comes “out of nowhere.”
- Since no other person could ever have complete knowledge of all inputs and the way information is processed, there is uncertainty about the decision.

Video:

<http://www.youtube.com/watch?v=fl1624SwYnl>

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

5

## Compatibilism/Incompatibilism

- **Compatibilism:** Free will and determinism are compatible.
- We are constrained to act in a certain way but have the freedom to choose otherwise.
- This is important for the issue of moral responsibility.
- **Incompatibilism:** Free will and determinism are irreconcilable.
- Causal laws prevent us from being true free agents.
- There is no moral responsibility for our actions.

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

6

### The Nature/Nurture Debate

- For example, twin studies, among others, show:
- The maximal capabilities (i.e., intelligence, athletic ability) that we can achieve are determined by nature (genes).
- The actual level that we achieve mainly depends on nurture (upbringing, environment).
- But are we born knowing nothing at all?
- Or do we start with some rudimentary understanding of the world?

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

7

### The Nature/Nurture Debate

Videos about identical twins:

- <http://www.youtube.com/watch?v=SX7hkiEkQu8>
- [http://www.youtube.com/watch?v=0yTCSHemS\\_0](http://www.youtube.com/watch?v=0yTCSHemS_0)
- [http://www.youtube.com/watch?v=REhKa3\\_oHL8](http://www.youtube.com/watch?v=REhKa3_oHL8)

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

8

### The Nature/Nurture Debate

- **Nativism:** Significant body of knowledge is innate, i.e., “built into” an organism (Plato).
- **Rationalism:** Innate ideas and innate reasoning powers (logical propositions) (Descartes).
- **Empiricism:** Knowledge is gained through interaction with the environment (John Locke).

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

9

### The Nature/Nurture Debate

- Knowledge of certain facts cannot be innate (“Who is the current president of the United States?”).
- There is certain “knowledge” right after birth, e.g., reflexes, smell preference.
- Famous example for this debate: Universal Grammar (Noam Chomsky):
  - All languages share certain properties.
  - Thus, there must be some innate (“hard-wired”) neural mechanisms that support these properties.
  - Counterargument: Such mechanisms could be of a general kind, not specific to language processing.

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

10

### Consciousness

- Subjective quality of experience (Chalmers)
- What is it like to be a bat (Nagel)?
- Problem: Science provides objective accounts, but consciousness is inherently subjective.
- Gulf between objective and subjective description of mental phenomena: explanatory gap.
- We have identified areas that are necessary for conscious experience, e.g., the thalamus (center for incoming sensory information).
- Example: “Blindsight:”
  - <http://www.youtube.com/watch?v=RuNDkcbq8PY>

October 15, 2009

Introduction to Cognitive Science  
Lecture 12: Philosophical Questions II

11