

#### Hume: Cause & Effect

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# Modern Neuroscience

"When making a decision of minor importance, I have always found it advantageous to consider all the pros and cons. In vital matters, however, the decision should come from the unconscious" Sigmund Freud

- Goal-directed thought
- Spontaneous thought

Visual cortex, medial temporal lobe and rostralateral PFC

### Impressions and Ideas

- Impressions come through our senses, emotions, and other mental phenomena
- Ideas are thoughts, beliefs, or memories that we connect to our impressions.
- Impressions have greater force than ideas (based directly on sensation
- Ideas are dependent copies of impressions

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# Associationism

- Mind associates things that are experienced together or are similar
  - There is a certain 'tie' or 'connection' that makes words likely to be associated
    - Ex. Fire and heat
- Natural operation of the mind—not reason or logic
- If ... you learn that chimpanzees like onions you will probably raise your estimate of the probability that gorillas like onions. In a network that uses distributed representations, this kind of generalization is automatic
  - Geoffery Hinton, David Rumelhart, and James McClellan
- Infant studies—nonspeech categorizations
- Classical Conditioning—Pavlov



#### Natural relations

"Universal principles, which render [the imagination] in some measure, uniform with itself in all times and places" *Treatise 1.1* 

- Resemblance
  - An object is similar to another
- Contiguity
  - An object is next to another in space or time
- Cause and Effect
  - A is the cause of B or B is the cause of A

### More relations

- Relations of Ideas
  - Derived by the operation of thought
  - Ex. Geometry and algebra
- Matters of Fact
  - Grounded in cause and effect
  - The contrary of every matter of fact is possible because it can never imply a contradiction
  - Beliefs that attempt to report the nature of things
  - "The sun will rise tomorrow" example
  - Ex. My name is Morgan –same object even if named Michelle
    - Keep in mind: imagination and belief differ only in their conviction that their objects are to be anticipated

#### http://www.youtube.com/watch?v=IQWBnwu1oZs

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# Definitions

#### Cause

- I. "An object, followed by another, and where all the objects, similar to the first are followed by objects similar to the second"
  - Conjunction
- II. "An object followed by another, and whose appearance always conveys the thought to that other" EHU 7.
  - More subjective?



### Cause and Effect

- Causation is the strongest relation of ideas
- We understand matters of fact according to causation, or cause and effect
  - Our experience of one event leads us to assume an unobserved cause
  - Examples:
    - Tenure
    - Violence and video games

### Effects are not observable in cause

- "The mind can never possibly find the effect in the supposed cause by the most accurate scrutiny and examination" AW 543b
- A priori knowledge can not determine effect
- Example: hold a pen in the air, you do not know what it will do





# Examples



### Empiricists & Experience

- Matters of Fact are based in causation which is learned from experiences
  - NOT based in a priori knowledge

"No object ever discovers, by the qualities which appear to the senses, either the causes which produced it or the effects which will arise from it; nor can our reason, unassisted by experience, ever draw any inference concerning real existence and matter of fact" AW 543a

### Effect is separate from cause

- Effect cannot be intuitively reasoned from a cause
  - Adam placed on Earth—water can drown
  - Marble example
- Matters of fact must be learned a posteriori
  - Supported by impressions
  - Circular argument?

### Induction

- We can't find the effect in a cause
  - Imagination can create a vast number of effects
- Reasoning about matters of fact is inductive
  - But these are unreliable and must assume:
    - That there is a connection between cause and effect
    - AND that the past will be representative of the future
  - Cause and effect is applicable to past and present NOT future