



THE SOCIAL APPROACH

OVERVIEW

1. What is social cognition?
2. Social cognitive neuroscience
3. Theory of mind
4. Basic social topics
5. Evaluation

WHAT IS SOCIAL COGNITION?

The background is a solid purple color. It features several decorative elements: a circular scale with degree markings (0, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200) in the top right corner; a dashed circular arrow in the bottom right; a solid circular arrow in the top left; and a dashed circular arrow in the bottom left.

SOCIAL COGNITION

- Social cognition is the study of how people make sense of other people and of themselves.
- Four standard assumptions (Friske and Taylor, 2008):
 - 1) Mentalism
 - 2) Representations develop, operate and change over time
 - 3) Cross-fertilization
 - 4) Applicability

PEOPLE-THINKING VS THING-THINKING

| Principle | People: | Things: |
|--------------------------|--|--|
| Intentionality | Attempt to control the environment | Not capable of controlling the environment |
| Mutuality | Think about each other | Don't "think back" |
| Self-concept | Judge us, provide information about us, and are more similar to us | Cannot judge or provide information about us, and are very different from us |
| Observational bias | Act differently when thought about | Do not act differently when thought about |
| Nonobservable attributes | Crucial traits can't be observed | Easily observed, less crucial traits |

PEOPLE-THINKING VS THING-THINKING

| Principle | People: | Things: |
|-----------------------|---|--|
| Change | Change over time and in different circumstances | Change less over time and in different circumstances |
| Accuracy of cognition | Traits and qualities are difficult to judge | Qualities are easier to judge |
| Complexity | Complex; simplifications are needed for understanding | Less complex |
| Explanation | Behavior needs to be explained | Explanation is not always necessary |

SOCIAL COGNITIVE NEUROSCIENCE

- THE CULTURAL INTELLIGENCE HYPOTHESIS
- JOINT ATTENTION
- MIRROR NEURONS

SOCIAL COGNITIVE NEUROSCIENCE

- Interdisciplinary area; three levels of analysis:
 - 1) Social psychology: Focuses on human interactions
 - 2) Cognitive perspective: Focuses on thought processes
 - 3) Neuroscience: Neural processing underpinning cognition and behavior in social settings

THE CULTURAL INTELLIGENCE HYPOTHESIS

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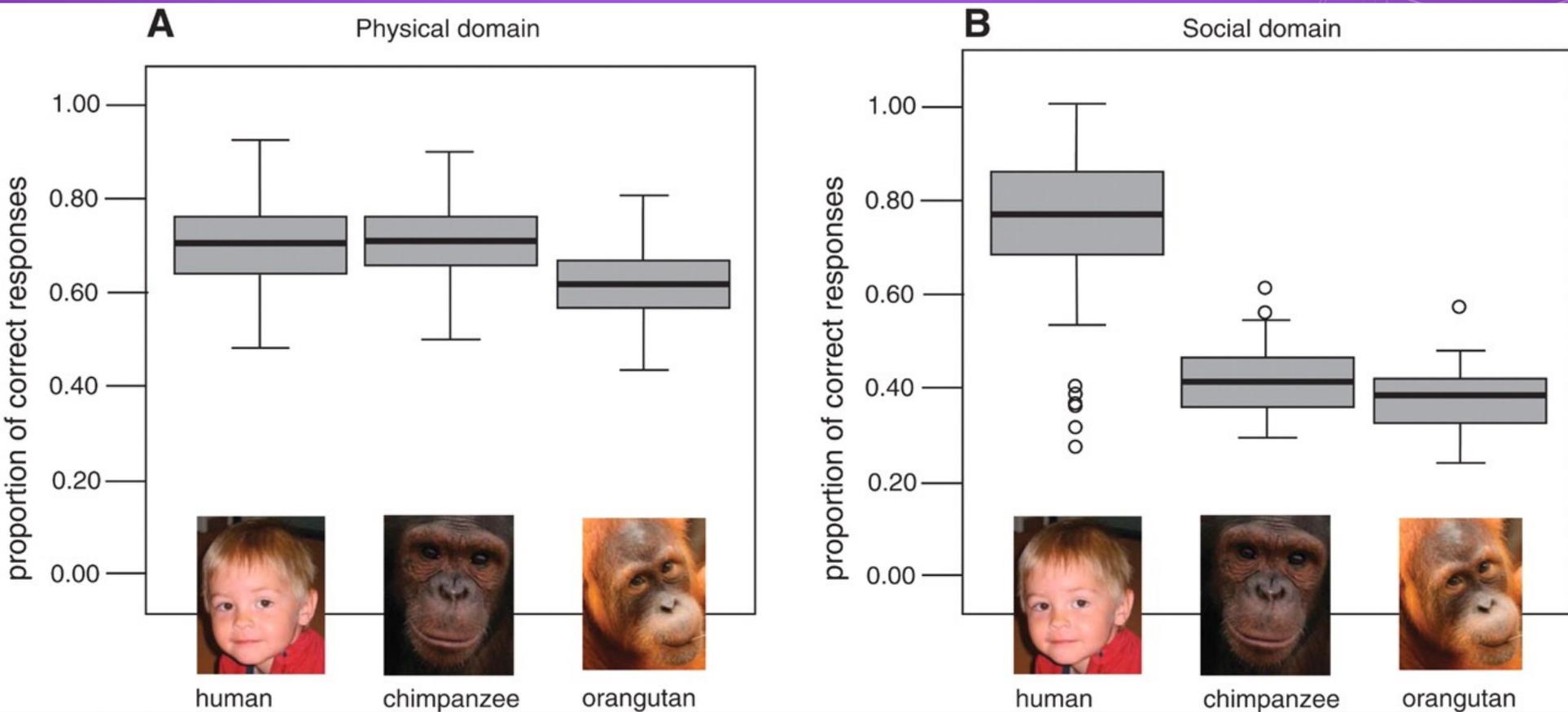
GENERAL INTELLIGENCE VS CULTURAL INTELLIGENCE

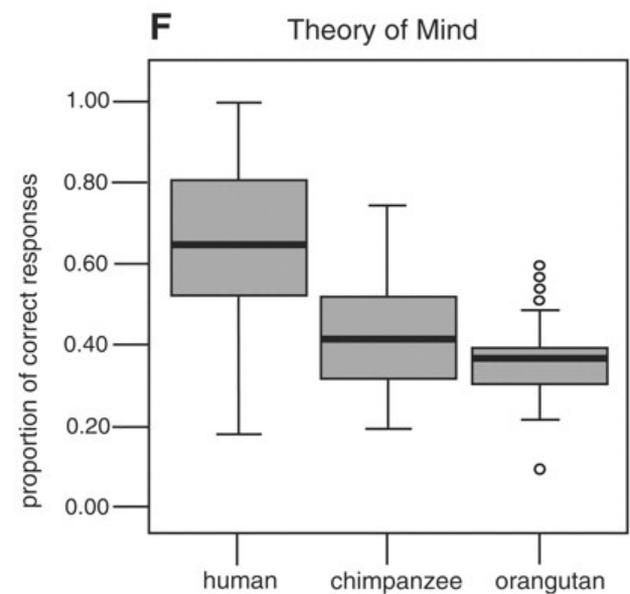
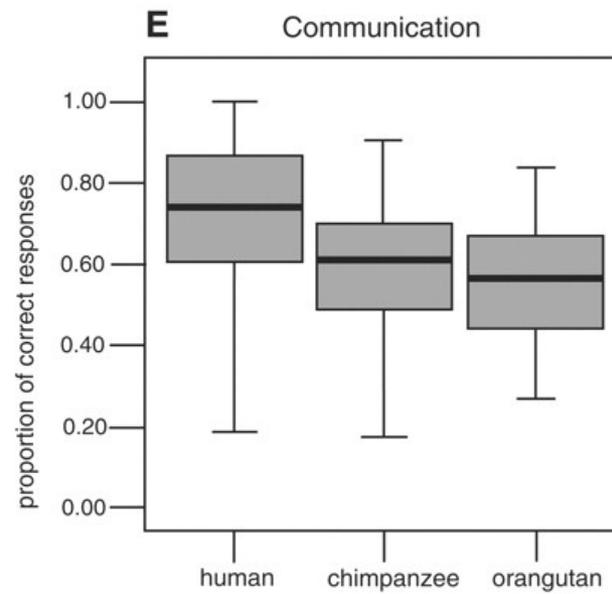
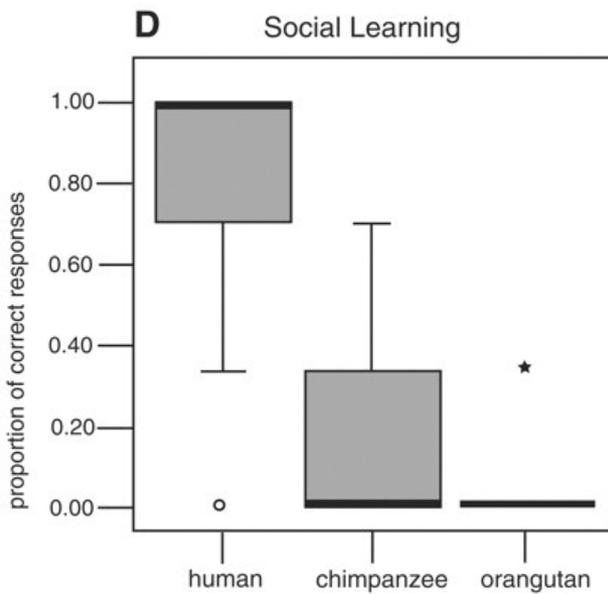
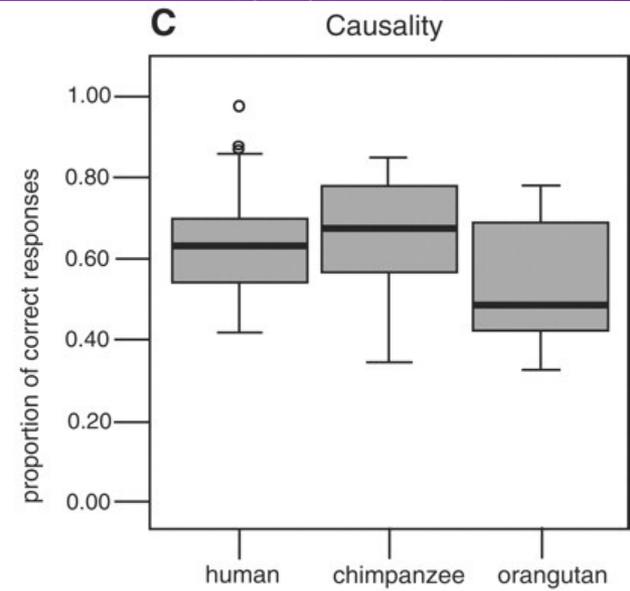
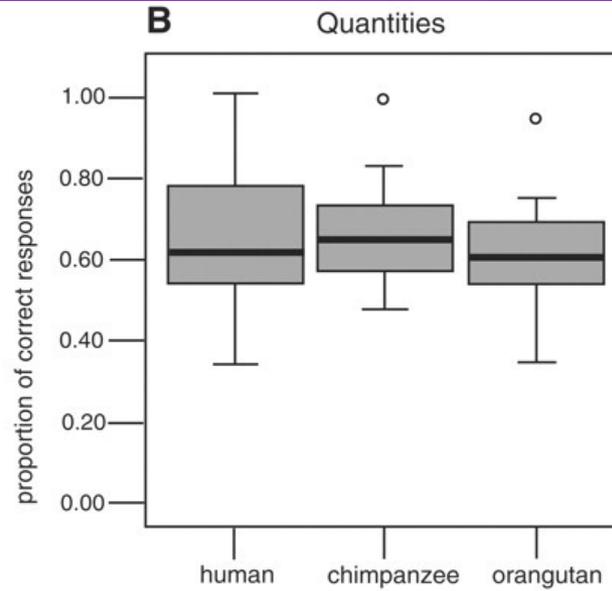
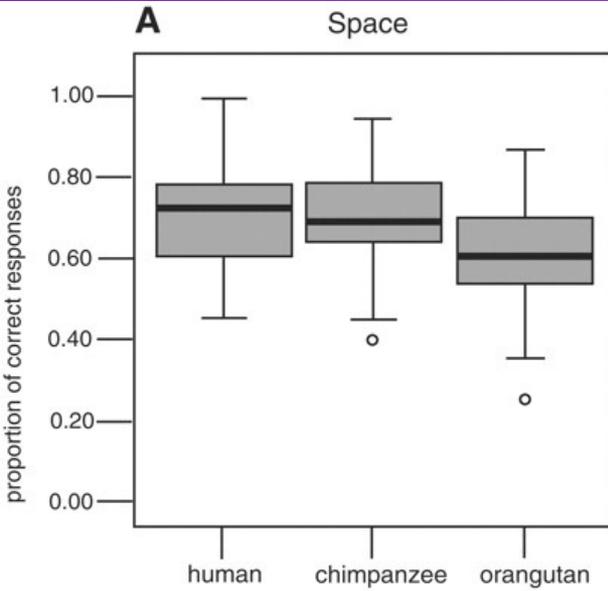
- **Cultural intelligence hypothesis:** General human intelligence is based on a form of social intelligence that arose from complex social interaction.
- **General intelligence hypothesis:** Human intelligence emerged in a general form, suited for solving all kinds of problems.

SUPPORT FOR THE CULTURAL INTELLIGENCE HYPOTHESIS

- From:

<https://tylertretsven.wordpress.com/2012/04/13/the-cultural-intelligence-hypothesis>





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JOINT ATTENTION

JOINT ATTENTION

- **Joint attention** is the ability to coordinate attention with a social partner.
- Via gaze and gestures
- Following, initiating or joining a shared attentional focus.

- Two categories:
 - a) Responding to joint attention (RJA)
 - b) Initiating joint attention (IJA)

- Chimpanzees have the capacity for RJA, but not for IJA
- Children with autism show impairments in IJA

JOINT ATTENTION AND DEVELOPMENT

- 9 to 12 months: Awareness of own and others' goals and activities (Tomasello et al., 2005)
- “Intentions lead to actions”
- Thought is representational: It is directed at objects and actions in the world
- Language and communication help conveying the contents of one's mind to others

JOINT ATTENTION NEURAL NETWORKS

- There are two attentional modulation systems underlying joint attention:
 - 1) Posterior orienting and perception system –Learning of RJA
 - Parietal association cortex and superior temporal cortex
 - Involuntary; it directs attention to biologically meaningful stimuli
 - Basic/perceptual
 - Chimpanzees have a posterior system; this may explain their capacity for RJA

JOINT ATTENTION NEURAL NETWORKS

2) Anterior attention system –Capacity for IJA

- Frontal eye fields, orbital frontal cortex, prefrontal association cortex, and anterior cingulate
- Controls voluntary, goal directed attention
- Sophisticated/conceptual
- Chimpanzees' lack of anterior system may explain their lack of IJA ability.

JOINT ATTENTION AND DEVELOPMENT

- **Social cognitive joint attention** arises by the interaction of the anterior and posterior systems with each other and with other processes, according to the following timetable:
 - ✓ 3-6 months: Speed of processing, motivation, splitting attention
 - ✓ 7-9 months: Integrated self-other attention processing
 - ✓ 10-18 months: Social attention executive function
- Lack of communication between anterior and posterior brain areas may explain autistic children's lack of social cognitive skills.

MIRROR NEURONS

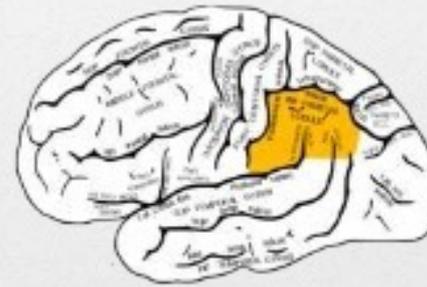
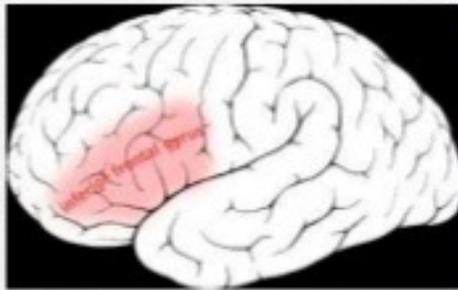
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MIRROR NEURONS

- Mirror neurons are neurons that fire when an animal performs an action, as well as when it observes another animal perform the same action.
- Mirror neurons might explain the imitative behavior that some animals display in learning.

MIRROR NEURONS IN THE MACAQUE BRAIN

Where are Mirror Neurons Found in the Brain of Macaques?

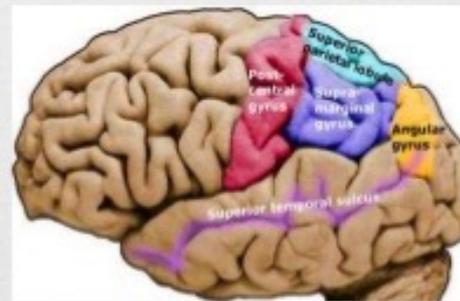
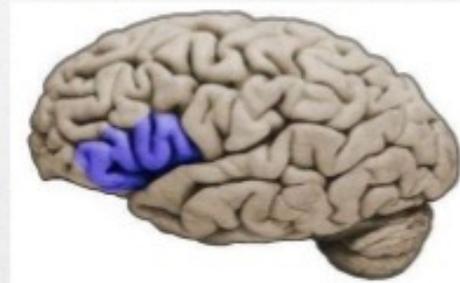


Found in the inferior frontal gyrus (F5 brain region), and inferior parietal lobule of macaque monkeys.

MIRROR NEURONS IN THE HUMAN BRAIN

Where Are Mirror Neurons Found in the Brain of Humans?

In humans, these are found in the inferior frontal cortex (Broca's Area) and the superior parietal lobe. Broca's area is implicated in producing complex hand movements as well as both sensorimotor learning and integration. (2)



[Slides are borrowed from:

<https://www.slideshare.net/MeganDempsey3/mirrorneurondraft421>]

ARE MIRROR NEURONS FOR EMPATHY?

- Research on the subjective experiences of pain and disgust suggests that there might be mirror neurons associated not only with action performance, but also with emotional states.
- The **anterior cingulate cortex** is activated both when pain is experienced, and when another's pain is observed.
- The **anterior insula** is activated both when disgust is experienced, and when someone else is observed experiencing disgust.

IS SOCIAL COGNITION THE BRAIN'S DEFAULT STATE?

- Mitchell, 2008; Gusnard & Raichle, 2001
- Brain areas implicated in social thinking consume more energy when at rest than other areas
- Medial prefrontal cortex, right temporoparietal junction, precuneus/posterior cingulate cortex.
- This indicates that these areas remain “on” and ready for action.
- Also, social brain areas need to be “turned off” in order to think about nonsocial topics.
- This suggests an interference of the “people-mode” with non-social thinking.

CHALLENGES FOR SOCIAL COGNITIVE NEUROSCIENCE

- Are there really special cognitive mechanisms or neural processes for social interaction?
 - ✓ mPFC is activated during social tasks, but not during non-social tasks
 - ✓ Tested for mental attribution and impression formation
 - ✓ rTPJ is activated in belief-attribution tasks
 - But also in attention shifts

ADVANTAGES OF SOCIAL COGNITIVE NEUROSCIENCE

- ✓ Unification of the field by discovering common mechanisms underlying seemingly disparate processes
 - For instance: Attitudes and attributions
- ✓ Separation of what was thought to be unified
 - For instance: Types of stereotypes
- ✓ Integration of bottom-up and top-down approaches

THEORY OF MIND

- WHAT IS THEORY OF MIND?
- THE NEUROSCIENCE OF THEORY OF MIND
- THEORY OF MIND AND AUTISM

WHAT IS THEORY OF MIND?

- A theory of mind is our capacity to understand other people's mental states, to appreciate how these differ from our own, and to use this understanding to guide our behavior when interacting with them.
- It is acquired by children at around 4-5 years
- The Sally-Ann task (Gallagher, 2000): Requires to take the perspective of another person, taking into account her beliefs

THE NEUROSCIENCE OF THEORY OF MIND

- Four neural systems underlie theory of mind (Siegel and Varley, 2002):

| Brain system | General cognitive function | Specific theory of mind function |
|--|--|---|
| Left hemisphere | Linguistic syntax, propositional reasoning | Entertainment of false belief |
| Frontal lobes | Executive function, problem solving | Suppression of the object's real location (Sally-Anne task) |
| Right temporal sulcus and right temporo-parietal areas | Perception of biological motion | Inferring intention |
| Amygdala | Fear response | Emotional aspects |

THEORY OF MIND AND AUTISM

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WHAT IS AUTISM?

- **Autism** is a neurodevelopmental disorder characterized by impaired social interaction and accompanied by restricted and repetitive behavior (Bailey, Phillips and Reuter, 1996).
- Patients with autism are egocentric and show impairments in verbal and non-verbal communication.
- About 0.3 to 0.7% of the general population are afflicted with autism
- Origins of autism are genetic
- A mild version: **Asperger syndrome**
- Patients with Asperger syndrome do not show cognitive or linguistic developmental delays
- Symptoms appear in adulthood

AUTISM AND THEORY OF MIND

- According to Fritz (2001), one of the key cognitive deficits in autism is a failure to mentalize.
- Mentalizing: Understanding that others have cognitive states such as beliefs and desires.
- Autistic children fail to achieve developmental milestones, such as:
 - Capacity for shared attention: They fail to follow another person's gaze or to point toward objects of interest
 - They do not understand make-believe play
 - No preference is given to speech over other auditory stimuli
 - No preference for faces over other visual stimuli

AUTISM AND THEORY OF MIND

- Neuroimaging studies (Happé et al. 1996) have showed that Asperger patients in mentalizing tasks show less mPFC activation, compared to neurotypical subjects (although they scored equivalently).
- In exchange, they showed more activation in ventral frontal cortex.
- In evaluating others' inner states from their facial expressions, autistic patients showed less frontal activation than normal controls, and no amygdala activation at all.

OTHER SOCIAL COGNITIVE DISORDERS

- **Williams syndrome:** Genetic disease characterized by deletion on chromosome 7.
 - Hypersociability: Exaggerated interest in other people, increased expressiveness and social communicability.
 - Syndrome is accompanied by some cognitive and motor deficits.
- **Social phobia:** Fear of public places, social interaction, and of being evaluated negatively by others.

BASIC SOCIAL TOPICS

- ATTITUDES
- IMPRESSIONS
- ATTRIBUTION
- STEREOTYPES
- PREJUDICE

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ATTITUDES

WHAT IS AN ATTITUDE?

- An **attitude** is a learned predisposition to respond to a particular object in a particular way (Petty and Wegener, 1998).
- Object: Things, people, or ideas.
- Attitudes have three components:
 - (1) Cognitive: Beliefs and thoughts
 - (2) Affective: Feelings and emotions
 - (3) Behavioral: Influence in our actions

ATTITUDES AND ACTIONS

- It is possible to think about an object in one way, and act towards it in a different way (example: cheating on an exam)
- The influence of attitudes on actions obeys to three factors:
 - 1) **Outside influence:** The minimal outside influence there is, the more likely is an attitude to guide action
 - 2) **Relevance:** The more specifically relevant is an attitude to a certain action, the more likely it is to guide it
 - 3) **Awareness:** The more conscious an attitude is, the more likely it is to guide action

CAN OUR ACTIONS INFLUENCE OUR ATTITUDES?

- **“Saying is believing”**: Repeatedly asserting an attitude makes it more likely to behave as if we possessed that attitude (Powell and Fazio, 1984)
- **The foot-in-the-door phenomenon**: Agreeing to a small request now makes it more likely that we will agree to a larger one later (Cialdini, 1993)
- “Doing now becomes believing later”
- Brainwashing

COGNITIVE DISSONANCE

- Cognitive dissonance is the uncomfortable psychological state that arises when there is a conflict between attitudes and behaviors, or between two attitudes.
- Cognitive dissonance threatens our view of ourselves as consistent beings.
- It might be reduced by direct strategies or by indirect strategies.
- Reduction of cognitive dissonance can take place either by conscious reasoning or by unconscious, automatic processes.

ATTITUDES AND PERCEPTION

- **Principle of selective exposure:** People seek information that supports consistency
- Information suited to our needs and dispositions
- Evidence: The types of people we seek as friends, the sorts of movies we like to watch, the music we listen to are attitude reinforcers.
- However: Sometimes new or useful information can be more important than dissonance avoidance

ATTITUDES AND ATTENTION

- Consistent information draws more attention than inconsistent information.
- Evidence: People spend more time looking at consistent information rather than at inconsistent information
- Repressors spend less time looking at the picture they dislike; sensitizers spent equal amounts of time looking at liked and disliked pictures.

ATTITUDES AND INTERPRETATION

- Ambiguous information is interpreted in a way that makes it consistent with our attitudes.
- Evidence: A positive attitude towards a presidential candidate makes it more likely to judge her debate performances in a positive way.

ATTITUDES AND LEARNING

- Material that is consistent with our attitudes is learned more easily.
- However: This happens only in cases of incidental (non-intentional) learning.
- Under intentional learning conditions, when people know that they will be tested on the materials, both consistent and inconsistent information is learned equally well.

ATTITUDES AND MEMORY

- Information that is consistent with our attitudes is remembered more easily.
- Evidence: A person that is judged as good for a particular job has more of her job-related traits remembered
- Also: It is possible to hold two different attitudes about something in memory.
- Recently acquired attitudes exert more influence in conscious and voluntary cognitive processing
- Older attitudes exert more influence when a quick response is needed, or when there is cognitive load

THE NEUROSCIENCE OF ATTITUDES

- Event related potentials show that evaluative categorizations and non-evaluative categorizations are served by different (although not independent) brain areas.
- Evaluative categorizations are accompanied by posterior right hemisphere and amygdala activation.
- Non-evaluative categorizations are accompanied by activation in both hemispheres.