People Concepts

- Do we think about people in the same way that we think about inanimate objects?
What if your brother was a zombie?

- About zombies
  - Walk slowly
  - Eat brains
  - Mindless
Growing up with a Zombie

- If mindless, then
  - Never pleasantly surprised or disappointed
  - Not very smart but doesn’t believe in things that don’t exist (like Santa Claus)
  - Never in love or jealous
  - No personality
  - No use getting angry at a zombie (couldn’t do otherwise)
Growing up with a zombie would definitely take a lot of getting used to.
Growing up with a person--not so much.
People have minds
Social Cognition

Naturally we seem to have

- A *Mental Conception of People*
  - Understanding that people interact with one another,
  - they must perceive their goals,
  - they have distinct emotions connected with their goals.
  - they act according to their beliefs about their goals, right or wrong.
  - they have personalities or dispositions
Some argue that a **mental conception of people** is an **innate aspect of human psychology** (like language)

- is a uniquely human ability
- is present in infants before they can understand language
- is genetically-based
Naive Psychology

- Naive psychology is a common sense understanding of human behavior in terms of mental causes
  - Why did Jack and Jill go up the hill?
  - Common sense: Because they wanted a pail of water and knew a pail of water was at the top of the hill.
Adult Theory of Mind

Perception
- see, hear, smell
- touch, feel

Belief
- believe, suppose
- know, expect
- doubt, suspect

Desire
- want, desire
- wish, hope
- ought, should

Action
- hit, grab
- accept, get
- search
- attend to

Reaction
- happiness, sadness, anger
- surprise, puzzlement

Basic Emotions/Physiology -
- love, like, enjoy
- hate, dislike, fear
- hunger, thirst
- pain, arousal
What you do vs. what you pursue
Infant ‘Psychology’

Infants look longer at first display.
• Just because infants code goals doesn’t mean they understand mental states
• It’s possible they have a behaviorist interpretation of the goal-directed behavior,
4-year-olds (N = 16)
5-year-olds (N = 16)
7-year-olds (N = 16)
10-year-olds (N = 16)
Adults (N = 16)

4-year-olds (N = 16)
5-year-olds (N = 16)
7-year-olds (N = 16)
10-year-olds (N = 16)
Adults (N = 16)

(Opfer, 2002)
To test whether judgments and perceptions of autonomous movement might independently elicit biological and psychological attributions, each participant’s self-movement attributions (0–4) were regressed against his or her attributions of biological (0–7) and psychological (0–7) capacities. In the No Goal condition, participants’ judgments of autonomous movement were unrelated to their attributions of biological ($r(79) = 0.18$, n.s.) and psychological capacities ($r(79) = 0.08$, n.s.). That is, when agents moved by themselves but toward no goal, participants who said that those agents did in fact move by themselves were no more likely to attribute biological and psychological capacities to the agents than participants who did not judge the agents to move by themselves. Indeed, for every age group that saw aimless self-movements, judgments of self-movement were unrelated to biological and psychological attributions ($R^2$s = $0.004–0.20$, n.s.). In the Goal condition, however, participants’ judgments of autonomous movement were strongly correlated with their attributions of biological capacities ($r(79) = 0.51$, P < 0.001), though not psychological capacities ($r(79) = 0.00$, n.s.), suggesting that the capacity for self-movement, while thought to be correlated with other biological capacities, is not thought to be sufficient to imply such capacities. Indeed, if we restrict our analysis of

Fig. 4. Five-year-olds’ attributions of biological and psychological capacities by condition. Asterisks indicate attributions that differ from chance ($P < 0.05$).
Fig. 7. Adults’ attributions of biological and psychological capacities by condition. Asterisks indicate attributions that differ from chance ($P < 0.05$).
Development of Theory of Mind

- By 2 to 3 years old, children typically understand *desires* > behavior
- But they do not appear to represent others’ *beliefs* until age 4
- Evidence from the false belief task
False Belief Task:
Unexpected Contents
1. Maxi places ball in cupboard.
Unexpected transfer

2. Maxi leaves and a second doll enters.
3. Second doll takes ball out of cupboard and puts it under bed.
Unexpected Transfer


Where will Maxi look for the ball?
False Belief Task: Unexpected Transfer
Origins of Naive Psychology

- Evidence for an innate “theory of mind module”
  - Autism
  - Species-Specificity
  - Newborn Attention to Relevant Input (e.g., faces)
Theory of Mind Module?

- **False Picture Task**
  - Picture of apple is taken
  - Apple is replaced by banana
  - *Which object is in the picture?*

![Bar chart showing performance on False Picture Task]

- Percentage passing
- False belief vs. False picture
- Type of test:
  - Autistic children and adolescents
  - Normal 4-year-olds
Theory of Mind Module?

- **Hypothesis:** False belief and false picture reasoning depends on distinct neural mechanisms
  - a false belief mechanism that is impaired in autists and young children, but not older children
  - a false picture mechanism that is spared in autists, young children, and older children
Sabbagh & Taylor (2000) gave normal young children a false picture and a false belief task and examined the areas of the brain that were activated.
Theory of Mind Module?
Povinelli and Eddy (1996) wondered whether mental understandings are unique to humans.

- So they trained 4- to 5-year-old chimps to beg food from only one of two people—the one who had food to give.
- Then they tested whether they would beg for food only from people who could see them. In each trial, one person could see the chimp, whereas the other either had her back turned, was blindfolded, covered her eyes with her hands, had a bucket on her head, had her eyes closed, or was looking up in the air.
- Only when the experimenter had her back turned did the chimp quit begging.
- In contrast, 3-year-olds never gestured to people with buckets on their head.
Where might a “theory of mind” come from?

- **Attention to faces**
  - Faces are a rich source of input about others’ mental states
  - When do infants begin to pay attention to faces?
    - After they learn that faces have high cue validity for emotions?
    - At birth?
Evidence for domain-specific learning mechanisms

- **Johnson et al. (1991)**
  - Discovered that **newborns** visually track regular schematic faces for longer than they do a scrambled or black face
Evidence for domain-specific learning mechanisms

- Sensitivity to faces is present before infants understand the meaning of different facial expressions
  - Between 5 and 7 months, infants notice common emotional expressions in faces and voices
  - By 12 months, they prefer to look at smiling faces vs. fearful or angry faces
Evidence for domain-specific learning mechanisms

- Newborns prefer to look at faces judged as attractive by adults versus not-so-attractive faces
- This preference affects 12-month-olds’ behavior
  - Langlois et al. 1990: same woman wore either an attractive or unattractive mask
    - Infants responded with more pleasure, more engagement, and less withdrawal when the woman wore the attractive mask
    - The key was that the woman herself did not know which mask she was wearing
Evidence for domain-specific learning mechanisms

- Neural mechanisms (in the right fusiform gyrus) underlying face perception and recognition in infants have been found to be similar to those found in adults.
  - Infants (like adults) recognize a face faster if the face is initially presented in the left visual field (to activate the right hemisphere)
  - Prosopagnosiacs (who can identify inanimate objects but not faces) show damage to brain areas (such as right fusiform gyrus) that are activated by faces in infants
Recent Criticisms

- Although early attention to faces may give infants an advantage in learning about humans, face preferences may reflect experience and general information-processing features.
Recent Criticisms

- Infants have been shown to prefer faces with normal arrangements vs. scrambled features
- But this may reflect their preference for upright Ts and figures with closed contours
Recent Criticisms

• Experience also plays a role in face recognition
  • Early on, infants are more sensitive to differences in monkey faces than older infants, suggesting that the face processing system is at least fine tuned by experience
Recent Criticisms

- The fusiform gyrus is also recruited in non-face recognition tasks, such as learning to recognize novel shapes.
People Concepts

- Do we think about people in the same way that we think about inanimate objects?
  - In some ways, NO: Belief-Desire reasoning appears to rely on distinct brain mechanisms that fail to develop fully in autists and non-humans
  - In some ways, YES: Much of what we know about beliefs and desires comes from what we can see in faces, and face processing relies on neural regions that are also used in object recognition
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Children’s Developing Understanding of Emotion

**Involves:**
- Identifying the emotions of others
- Understanding the causes of emotion
- Understanding real and false emotions
- Understanding simultaneous and ambivalent emotions
Newborns can imitate some emotional expressions.
Identifying the Emotions of Others

- By 4–7 months, infants can distinguish emotions in others
  - Best at happiness and surprise.
  - Also recognize sadness in others
Identifying the Emotions of Others

- By age 3, children can label the emotions displayed in pictures of puppets’ faces.
  - Best at labeling happiness and other positive emotions
- By late preschool/early elementary school, children can distinguish different negative emotions—anger, fear, and sadness.
  - Children who are abused recognize anger in faces that adults cannot detect
Measure of Children’s Ability to Label Others’ Emotions

Children are asked to view pictures like these and identify the emotions of the characters. With age, children can better identify appropriate emotions.
Understanding the Causes of Emotion

- Knowing the causes of emotions is important for understanding one’s own and others’ behavior and motives and for regulating one’s own behavior.
- During preschool and school years, children rapidly develop understanding of how different situations evoke different emotions.
Many days later ...
Understanding Real vs. False Emotions

- **At about age 3,** children can mask their own emotion of disappointment but not yet recognize false expressions in others.
- **By age 5,** the ability to distinguish true from false expressions develops to include understanding that the facial expressions of others may be misleading.
Understanding Real vs. False Emotions

- **Display rules:**
  - Informal norms about when, where, and how much one should show emotions, and when emotions should be suppressed or masked.
- **During preschool and elementary school years, children advance in understanding of display rules.**
  - They learn both prosocial and self-protective motives for false expressions.
5-year-old

Display Rules
Understanding Simultaneous Emotions

- **Between the ages of 5 and 7,** children come to realize that they can simultaneously feel two compatible emotions about different events (for example, feeling both happy and excited).

- **By mid- to late childhood,** children realize that they and others can experience positive and negative emotions related to the same source (for example, happy to receive a gift and sad that it was not what they wanted).
By age 10,

- children can understand emotional ambivalence, recognizing that people can have mixed feelings.