THE DEVELOPMENT OF SOCIAL COGNITION

Evolutionary Perspective

- Survival value in understanding human behavior and social relationships
- Implies certain aspects of social cognition may have a biological basis laid down through natural selection over time
- Thus, infants should display some rudiments of social cognitions

Foundations of Social Cognition

Attention to Social Stimuli

- Infants are more interested in attending to people than other objects in their social world
- Newborns prefer facelike to non-facelike stimuli (Mondlock et al., 1999)
- Infants especially attentive to complex sounds such as human speech and they are capable of making fine discriminations among the sounds used in human languages (Eimas et al., 1971)
- Infants show a preference for infant-directed speech ("motherese") (Cooper & Aslin, 1990)

Foundations of Social Cognition
Attention to Social Stimuli

- 5- to 8-week-olds imitated mouth movements (sticking out tongue or opening mouth wide) that were produced by another person (Legerstee, 1991; Moltsoff & Moore, 1977) but did not imitate inanimate objects such as a tube with a tongue that could protrude or a box with a mouth that could open on the side
- Infants smile more at people than objects (Ellsworth, Muir, & Hains, 1993)

Foundations of Social Cognition

Attention to Social Stimuli

- At birth, infants can discriminate their own mother's voices from the voices of other women (DeCasper & Fifer, 1980)
- "Stranger Anxiety" develops late in the first year, indicating that infants strongly distinguished familiar from unfamiliar people in their social worlds

Foundations of Social Cognition
Early Social Interactions

- Contingent interaction
  - Reciprocal actions and reactions that resemble the mutual give-and-take of conversation.
  - Indicate that infants anticipate certain types of behavior on the part of their interaction partners.
- Infants begin to follow adults' gaze at about 3 months of age; this becomes well established by 9 months (Butterworth, 2001).
- Infants begin to follow adult's pointing gestures (Morissette et al., 1995; Murphy & Messer, 1977)

Foundations of Social Cognition
Early Social Interactions

- Joint Attention
  - By following their caregivers' gaze and gestures, infants contribute to establishing joint attention, a state in which they and their caregivers share a common focus on particular objects or events.
  - Joint attention is thought to be an important prerequisite for the development of communicative skills (Baldwin, 1991, 1993b).

Foundations of Social Cognition
Early Social Interactions

- Still Face Experiment – 3-month-olds
  - Smile less
  - Avert their gaze
  - Heart rates change in ways that indicate arousal
  - Some infants fuss or cry (Kisilevsky et al., 1998; Toda & Fogel, 1993; Tronick, Als, Adamson, Wide, & Brazelton, 1978).
  - Suggests "still face" violates infants' expectations about caregivers' interactive behavior
  - http://www.youtube.com/watch?v=apzXGEbZht0&feature=related

Foundations of Social Cognition

Early Understanding of Emotional Expression

- Understanding of Emotional Expression in 5-month-olds
  - Presented infants with two films of an unfamiliar adult.
  - One film - speaking angrily with angry face
  - Other film – speaking happily with happy facial experssions
  - Played with either the matched or unmatched soundtrack.
  - Infants looked longer at the matched soundtrack, regardless of whether it was happy or angry
  - Suggests that by 5 months of age they had some knowledge about different emotions and how they are expressed facially and vocally. (Walker, 1992)

Foundations of Social Cognition

Early Understanding of Emotional Expression

- Social Referencing
  - In the second half of the first year, infants begin to gauge the emotional reactions of other people in order to evaluate situations or objects as safe or risky.
  - Has been documented in infants as young as 6-months of age (Walden & Ogan, 1988)

Foundations of Social Cognition

Early Understanding of Emotional Expression

- Visual Cliff – 12-month-olds infants'
  - Caregivers posed either in a frightened or angry expression, or in a joyful expression (Sorce, Emde, Campos, & Klinnert,1985).
  - Infants recognize other people and their emotional expressions as a potential source of information.
    - http://www.youtube.com/watch?v=eyxMq11xWzM

Foundations of Social Cognition
Concepts of Other People

- Children's concepts of other people evolve from a focus on concrete, external, observable characteristics to more abstract, internal, non-observable ones.
- Preschoolers may observe situation-specific psychological states, but generally don't refer to enduring dispositions or traits.

Understanding of the Self

Awareness and Recognition of Self

- When do babies first become aware of themselves?
  - 3-month-olds look at other baby more than themselves when watching a video-clip of the two of them (Bahrick, Moss, & Fadil, 1996)
  - Rouge Test
    - Most 12-month olds touch the mark on the mirror
    - Most 15-month-olds touch the mark on their face; indicating they recognize the infant in the mirror as themselves. (Amsterdam, 1972; Bullock & Luetkenhaus, 1990; Lewis & Brooks-Gunn, 1979)
    - http://www.youtube.com/watch?v=cTP01Wbsh0E&feature=related

Understanding of the Self
Concepts of the Self

- Toddler s – age, sex, physical characteristics (such as “I’m big”) and evaluative qualities such as goodness or naughtiness (“I’m a good girl”) (Stipek, Gralinski, & Kopp, 1990)
- Preschoolers - concrete, observable characteristics, such as their physical characteristics, possessions, and typical activities

Understanding of the Self

Concepts of the Self

- Middle Childhood – describe themselves in relation to others, "I'm smarter than my sister"
- Late Childhood – general dispositions or traits, "I'm friendly and outgoing"
- Adolescence – self-descriptions begin to reflect their expanding set of social roles and relationships (such as a student, daughter, friend, girlfriend) and the importance of social context (such as "I'm usually pretty serious, but when I'm with my friends, I can be very silly")

Understanding of the Self
Concepts of the Self

- Although most preschoolers seldom mention psychological characteristics, tasks less demanding in language skills show that children as young as 3 ½ have an understanding of their own disposition.
- Study asked children to select from pairs of statement:
  - "When I get angry, I feel like hitting someone."
  - "When I get angry, I feel like being quiet."
- Children selected answers that were consistent across related pairs (Elder, 1990)

Understanding of the Self
Concepts of the Self

- Children's descriptions of themselves become more abstract, more comparative, and more differentiated over developmental time.
- General progression from an early focus on stable, external, observable characteristics to a later focus on more variable, internal, and nonobservable ones.

Knowledge About Mental States & Activites

- Children need to acquire an understanding of the human mind.
  - People have goals, intentions, and expectations
  - People know some things and not others
  - The fact that they believe something does not mean that others do.

Knowledge about Mental States & Activities
Wellman's Belief-Desire Theory of Mind

- Having a theory of mind allows one to
  - Attribute thoughts (beliefs), desires, and intentions to others
  - To predict or explain their actions
  - To posit their intentions
  - Realize that mental states can be the cause of other's behavior
- Implies one must conceive of the mind as a generator of representations

Knowledge about Mental States & Activities
Wellman's Belief-Desire Theory of Mind

- Understanding mental states as representations of reality enables individuals to predict and explain others' actions.
  - For example, if a girl knows that her brother believes that there are cookies in the cookie jar, she can expect that her brother will look in the cookie jar when he wants to have a cookie. Furthermore, she can expect her brother to look in the cookies jar, even if she knows that their mother has removed the cookies and placed them in the freezer. It is her brother's representation of the world, and not the true state of the world, that dictates his actions

Knowledge about Mental States
Wellman's Belief-Desire Theory of Mind

- Children enter the world predisposed to form reasonable theories about how the mind works.
- From 3-years onward, children have a naïve theory of how the mind works.
- Understanding of Intentions, desires, and beliefs have been studied individually

Knowledge about Mental States & Activities

Understanding of Intention

- Six-month-olds habituated to either a person speaking to the area behind a barrier or reaching behind the barrier.
- A hidden object was revealed
- Children looked longer when the object was that which you would not expect (object in the speaking condition, person in the reaching condition). (Legerstee, Barna, & DiAdamo, 2000)
  - Thus, by age 6 months, infants recognize that people have different intentions towards people and objects.

Knowledge about Mental States & Activities

Understanding of Intention

- 14-month old Accidental vs. Intentional experiment
  - Adults demonstrated actions and then said either whoops! Or "there!"
  - Infants as young as 14-months old were more likely to repeat the action if it was marked as intentional rather than accidental.
- 18-month-old will try to imitate an action that an adult performed, even when they are not successful, but will not imitate the action an inanimate object made.
  - Adult tried pushing a button with a pole unsuccessfully, baby imitated. Toy robot did the same thing, baby did not imitate it. (Meltzoff, 1995).

Knowledge about Mental States & Activities
Understanding of Desires

- Desires are mental states that can be motivated by physiological states, emotions and preferences.
- Goldfish vs. broccoli experiment
  - Most infants chose the goldfish.
  - The experimenter said, "Mmmm, this broccoli is yummy" and asked baby to give them a snack.
    - 14-month-olds gave them the goldfish
    - 18-month-olds gave them the broccoli. (Repacholi and Gopnik, 1997).

Knowledge about Mental States & Activities
Understanding of Beliefs

- Appearance-reality Distinction – the knowledge that looks can be deceiving.
  - Children presented with sponges painted to look like rocks
  - Encourages to play with the objects, so they could learn that the objects were not what they appeared to be.
  - Asked what the objects looked like, and what they really were
  - 4- and 5-year-olds differentiated appearance from reality
  - 3-year-olds claimed the sponge looked like a rock and was a rock (Flavell, Flavell, and Green, 1983)

Knowledge about Mental States & Activities
Understanding of Beliefs

- False Belief Task
  - Gold standard in understanding of beliefs - success in tasks that require understanding of one's own or another person's false belief.
  - Example: Child shown a box of Smarties, asked what is inside, says, "Smarties", and is shown there is really pencils inside. Then asked what someone new will think is inside the Smarties box.
    - 5-year-olds predict the other child will say Smarties
    - 3-year-olds predict the other child will say pencils
    - http://www.youtube.com/watch?v=8hLubgpY2_w

Knowledge about Mental States & Activities
Understanding of Beliefs

- Location change task
- "Maxi puts his chocolate into the cupboard. He goes out to play. While he is outside, he can't see that his mother comes and transfers the chocolate from the cupboard into the table drawer. She then leaves to visit a friend. When Maxi comes home to get his chocolate, where will he look for it?"
  - Most children under 3 will say he will look in the drawer where it really is
  - By age 4, most children respond that Maxi will look in the cupboard.

Knowledge about Mental States & Activities
Understanding of Beliefs

- Factors that can affect performance:
  - Children can succeed at younger ages if the story involves deception as the motive for the change (such as the chocolate was moved to trick the protagonist)
  - Children perform better and succeed earlier if they carry out the transformation themselves (such as the children move the chocolate themselves, rather than watching the experimenter move it).

Knowledge about Mental States & Activities

Understanding of Beliefs

- Children perform better and succeed earlier if the target object is not present when the false belief question is asked (such as if the chocolate is removed from the drawer and eaten so it is no longer present).
- Children perform better and succeed earlier with stories in which the protagonist's belief is explicitly stated or pictured (such as if the story explicitly states, "Maxi thinks his chocolate is in the drawer") than in stories in which the protagonist's beliefs need to be inferred.
- Children older than about 4 years tend to perform better if the false belief question emphasizes the time frame involved (such as, "When Maxi comes back, where will he look first for his chocolate?").

Knowledge about Mental States & Activities
Understanding of Beliefs

- Why do 3-year-old fail the false-belief task? Three schools of thought-
  - Don't yet have Theory of Mind One (lack competency to understand that people's minds include representations that can differ from their own)
  - Demands that the task places on verbal skills or understanding of conversational conventions (performance can be improved by modifying task)
  - General information processing demands of the task, such as the ability to reason with complex, hierarchical rules or the ability to inhibit a dominant response.

Theory of Mind Impairment

- Hard time seeing things from any other perspective than their own.
- Difficulty determining the intentions of others.
- Lack understanding of how their behavior effects others.
- Difficult time with social reciprocity.
- Believed to be a key feature of autism (Baron-Cohen, Leslie, & Frith, 1985)

Theory of Mind Brain Mechanisms

- Neuroimaging studies show brain areas activated during Theory of Mind Tasks
  - Medial prefrontal cortex (mPFC)
    - Diminished in HFA *(preliminary finding)*
  - Posterior superior temporal sulcus (pSTS)
  - Temporoparietal junction *(lesions here associated with deficits in ToM)*
- Doesn't mean areas are exclusively dedicated to social cognition, but rather activated during social cognition tasks