



Lecture 4: Cognitive Development 2

- a) Understanding self and Others
- b) Language development.



Understanding Self: The concept of self

- The 'I' self (subjective self) – involves awareness of the 'I', the self that is separate from others
- The 'me' self (objective self) – involves awareness of the self as an object with properties



The 'I' Self (Subjective Self)

- Most developmentalists argue that the infant has some primitive sense of separateness from the beginning of life;
- During the first year the infant develops a sense of himself as an agent in the world (i.e. being able to make things happen);

The 'Me' Self (Objective Self)

- The infant comes to understand that he/she is also an object in the world, and that just as an object has properties, so does the self have properties;
- Infants as young as 4 months respond differently to live video or still photographic images of themselves and others;
- Self-recognition in a mirror/self-reference by name when shown a picture of themselves, emerge by about the middle of the second year (The rouge test):
 - <http://www.youtube.com/watch?v=cTP01Wbsh0E>
- The understanding that the 'me' self extends over time does not emerge for at least another year

The self

- The `self` cannot develop without an appreciation of `the other`.
- This develops over time.
- Murray & Trevarthen (1985) showed how the differentiation of self from others begins to occur:
 - Using a CCTV, 2-4 month old infants could interact with their mums, two ways normally to begin with. Then this was interrupted with a video of the mother, upon which they became distressed.
 - Why? Because mothers actions were no longer tied to the infants.



Self Understanding

- With development, self-understanding shows:

1. An increasing use of psychological concepts: `I am`
2. A stronger belief in the self's agency and volitional power: `I can`
3. A tendency toward integration of the disparate aspects of self into an internally consistent construct system: `I am shy...outgoing etc`

Self Understanding

Damon & Hart (1982) described the following developmental levels of self-understanding:

Infancy and early childhood - bodily properties or material possessions: `I am...`

Middle and late childhood - capabilities relative to others: `I can`

Early adolescence - social-personality characteristics: `I am`

Late adolescence - belief systems, personal philosophy: `I believe`



Self Understanding

- Rosenberg (1979) questioned children about points of **pride**. It was found that personality characteristics were mentioned by:
 - 9% 8 yr. olds
 - 17% 14 yr. olds
 - 28% 16 yr. Olds
- When asked about their hoped-for "**future self**", personality characteristics were mentioned by:
 - 36% 8 yr. olds
 - 69% 14 to 16 yr. olds

Self Understanding

- When asked who knew their “exterior self” the best (themselves or others):
 - 50% older children said themselves
 - 15% younger children said themselves
 - How can we explain this? They perceive that other people know them best
- When asked about who knew their “interior self” the best (themselves or others):
 - 70% older children said themselves
 - 50% younger children said themselves
 - TOM?



The Inner Self: Young Children's Theory of Mind



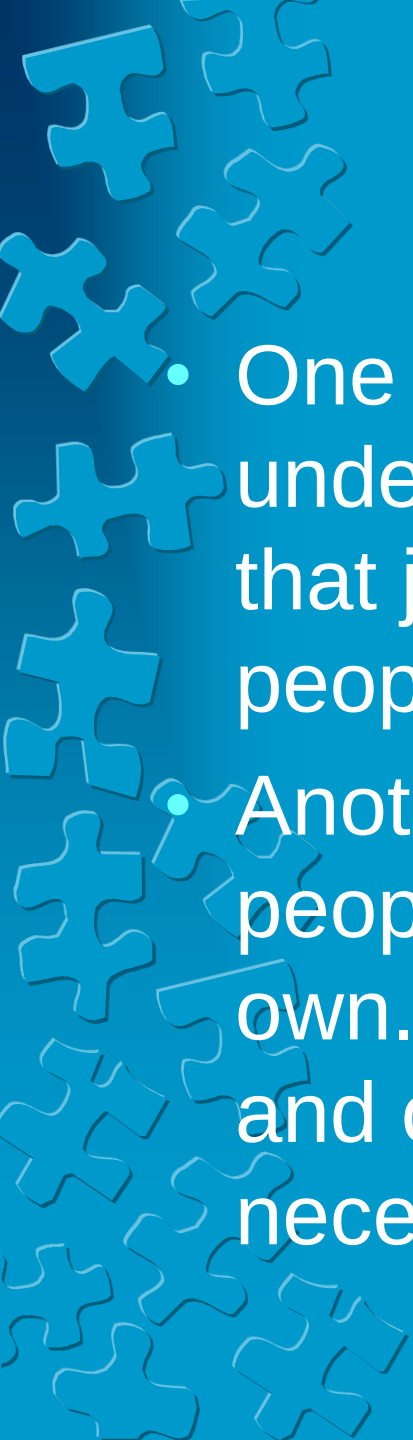
An Understanding of the Mind

- Having an understanding that other people have desires, beliefs, thoughts, feelings and their own interpretation of the world is often referred to as having a '*theory of mind*'.



What does it mean to have an understanding of mind?

1. We understand:
2. that we have emotions, feelings and desires, and;
3. that desires and feelings are related.
4. We realize:
5. that the mind includes knowledge;
6. that we can think about information;
7. that there is a difference between thoughts and real things;
8. that we have beliefs about the state of the world.



Understanding the Mind

- One of the most important aspects of understanding the mind is the realization that just as we have a mind, so do other people;
- Another important realization is that other people may have beliefs that differ from our own. Additionally, people can be deceptive and can lie. What is in our heads is not necessarily what we say. A TOM?

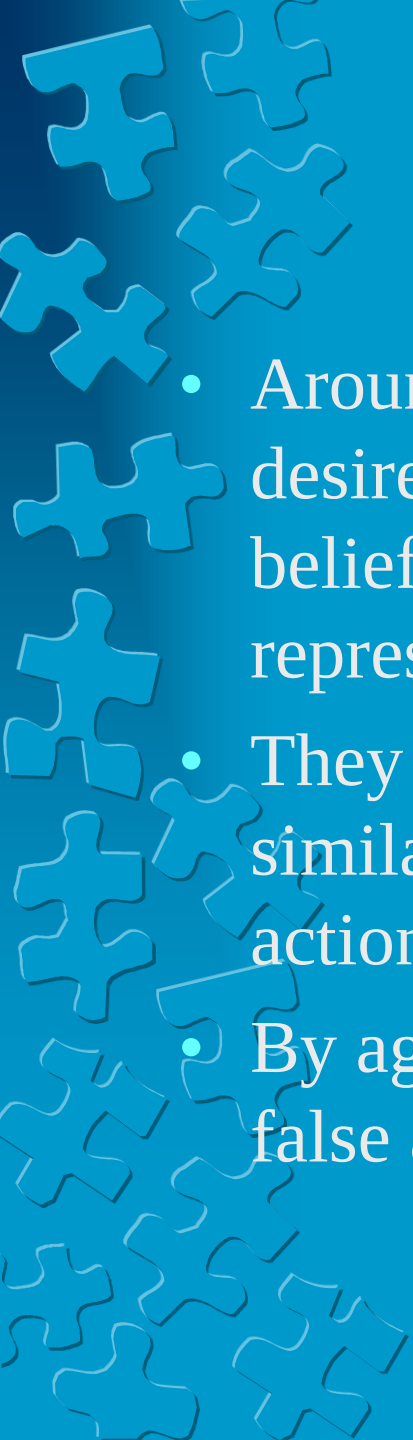


Origin of 'Theory of Mind' Research

- Research on 'theory of mind' was initiated by Premack and Woodruff (1978) in the context of determining the cognitive and language abilities of chimpanzees;
- According to Premack and Woodruff (1978): *"an individual has a theory of mind if he imputes mental states to himself and others"* (p.515).

Further evidence of 'mind-reading' in primates

- Byrne and Whiten (1987) argued that there is some evidence that chimpanzees are capable of displaying deliberately deceptive behaviour.
- <http://www.youtube.com/watch?v=BmISd0v7AdM>



The development of TOM

- Around 2 years, children refer to their mental states as desires or intentions, by 3 years they incorporate beliefs relating to a persons actions, as a representation of their beliefs.
- They can also acknowledge that people can have similar desires but different beliefs and thus different actions.
- By age 4 they can acknowledge that beliefs can be false and that we make mistakes.



Tasks for assessing 'theory of mind' abilities

1. False-belief and other related tasks
2. Mistaken location
3. Mistaken contents
4. Appearance/reality
5. Second-order false-belief

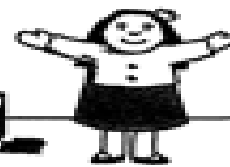


‘Mistaken Location’ Tasks

- The standard version involves the unexpected transfer of a desired object, so that the central character then has a false belief about the location of that object. To assess children’s understanding of the character’s false-belief, they are asked to predict where the character will look for the object
- (e.g. the Maxi task (Wimmer & Perner, 1983; the Sally-Anne task (Baron-Cohen, Leslie & Frith, 1985).



this is Sally



this is Anne



Sally puts her ball in the basket



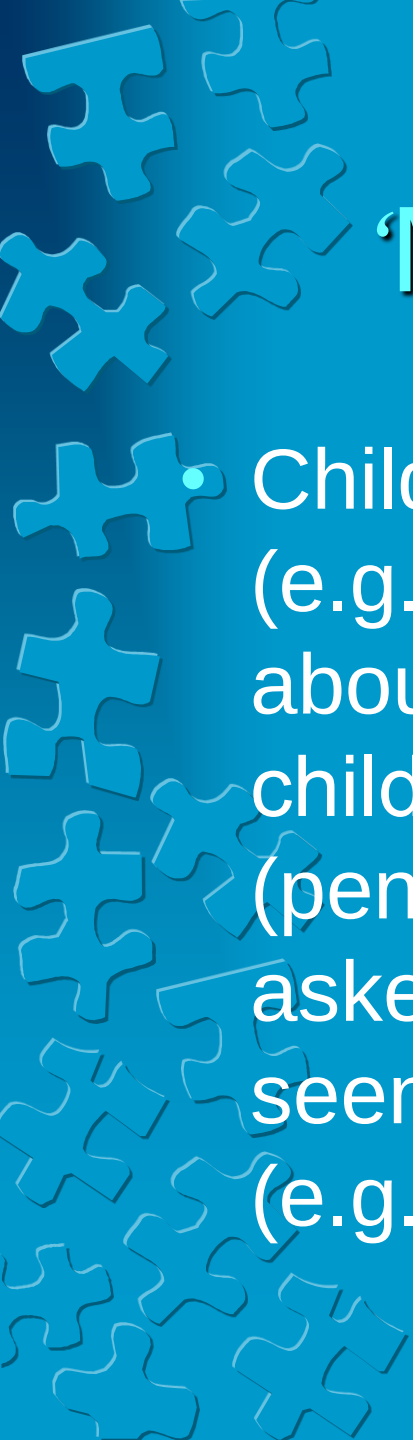
Sally goes away



Anne moves the ball to her box



where will Sally look for her ball?



‘Mistaken Contents’ Tasks

- Children are shown a typical container (e.g. a Smarties box). They are asked about the content of the box (practically all children say ‘Smarties’). The real content (pencils) is then revealed and children are asked what another child, who has not seen inside the box, will think is inside (e.g. Perner, Leekam & Wimmer, 1987).

‘Appearance/Reality’ Tasks

- This task involves two questions about, for example, a trick object, such as a sponge that looks like a rock; (1) an appearance question “What does this look like?”, and (2) a reality question “What is this really?” (e.g. Flavell, Green and Flavell, 1986).
- <http://www.youtube.com/watch?v=OEpu3dC5W70>
- <http://www.youtube.com/watch?v=B4lv5FnBBh0>



‘Second-Order’ False Belief Tasks

- Children are told a story about two characters (John and Mary). Mary is going home while an object is transferred from location A to location B. John watches the transfer but is not told that Mary independently finds out that the object has been transferred to location B. The test question is: “Where does John think that Mary will look for the object?” (Perner & Wimmer, 1985).

The task:

- The second order test is not about others beliefs, but about what others` think about other peoples thoughts!
- In the ice cream van scenario, both John and Mary were told about the transfer to a new location, both knew, but John thinks that Mary thinks it is in the old location. Where will he say she goes?

Task Results

- The typical developmental trend is that at age 3 years old, almost all typically developing children answer incorrectly, whereas most typically developing children of 4 years and older answer correctly (6 years for second-order false belief tasks).



When is 'theory of mind' achieved?

- Most typically developing children succeed on typical false-belief tasks by the age of 4. However, there is some evidence to suggest that younger children can succeed on false-belief tasks if the wording is made more specific (e.g. Lewis & Osborne, 1990; Siegal & Beattie, 1991).
 - Individual differences exist. These differences may reflect differences in language ability; interactions/conversations with adults/older siblings (e.g. Brown et al. 1996; Dunn, 1999; Jenkins & Astington, 1996; Lewis et al. 1996).
- 



Children with Autism

- Autism was first described by Kanner (1943) and Asperger (1944)
- Contemporary diagnosis of individuals with autism is based on the criteria described in DSM5
- The DSM criteria include two fundamental impairments:
 - Social-communication deficits and
 - Restricted and repetitive interests/behaviours (RRB)



'Theory of Mind' and Autism

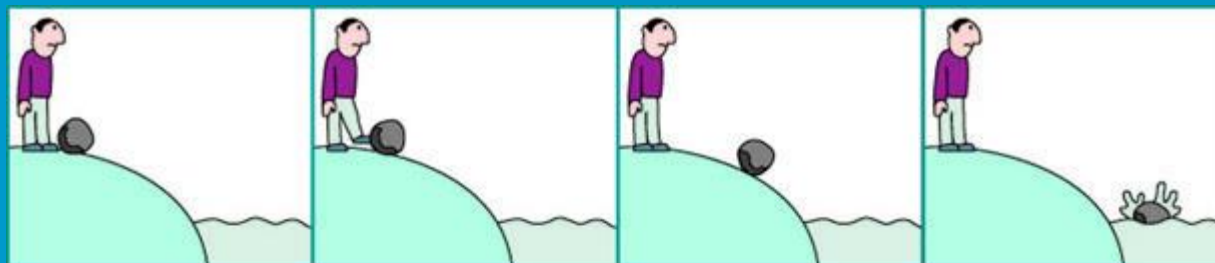
- Baron-Cohen et al. (1985) discovered that children with autism show serious delays in their acquisition of theory of mind'.
- In this study, most of the typically developing and Down Syndrome children passed, but all but a few of the children with autism failed, despite having a much higher mental age than the other children.



The 'Picture Stories' Experiment (Baron-Cohen, Leslie and Frith, 1984).

- Children were shown sets of 4 pictures, each of which made a story (mechanical, behavioural and intentional);
- Pictures were shown in a mixed up order and children were asked (i) to put them in an appropriate sequence and (ii) to tell the story in their own words;
- Children with autism performed poorly on the intentional stories but not on the mechanical or behavioural ones.

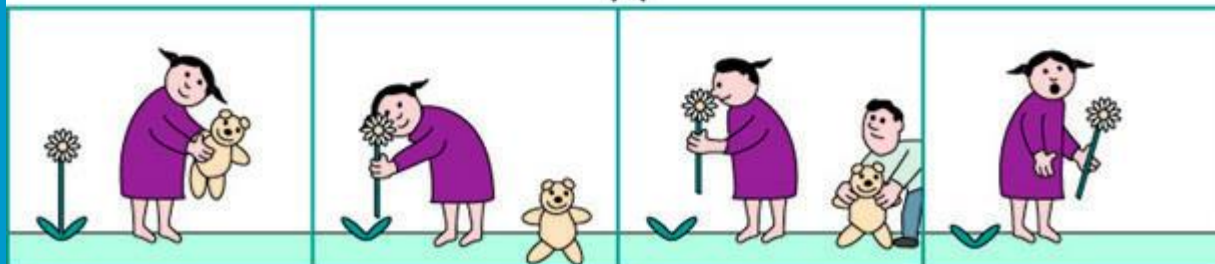
Picture stories



(a)



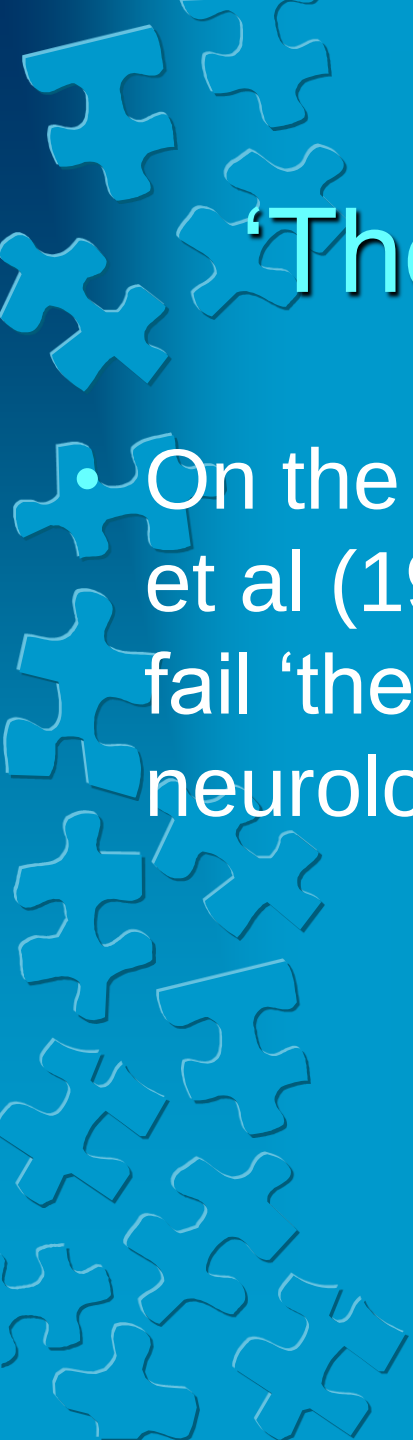
(b)



(c)

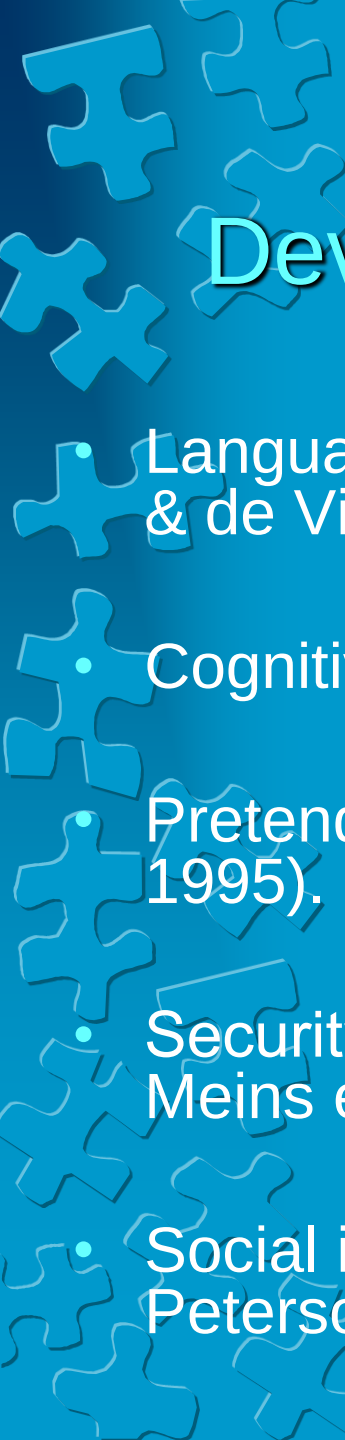


- Mechanical: person and object.
- Autistic children performed best of all groups.
- Behavioural: person to person.
- Autistic children and normal's performed similarly.
- Intentional: inferring a cause to behaviour.
Autistic children performed significantly worse than the other two groups.



‘Theory of Mind’ and Autism

- On the basis of these findings, Baron-Cohen et al (1985) argued that children with autism fail ‘theory of mind’ tasks due to an abnormal neurological impairment specific to autism.



Influences on Theory of Mind Development in Typically Developing Children

- Language ability (e.g. Jenkins and Astington, 1996; deVilliers & de Villiers, 2000; Hale & Tager-Flusberg, 2003).
- Cognitive abilities (e.g. Carlson & Moses, 2001).
- Pretend play (Harris & Leever, 2000; Astington & Jenkins, 1995).
- Security of Attachment/Maternal “mind mindedness” (e.g. Meins et al. 1998, 2002, 2003;
- Social interaction: Siblings (e.g. Jenkins et al. 2003; Peterson, 2001; Hughes & Dunn, 1998).



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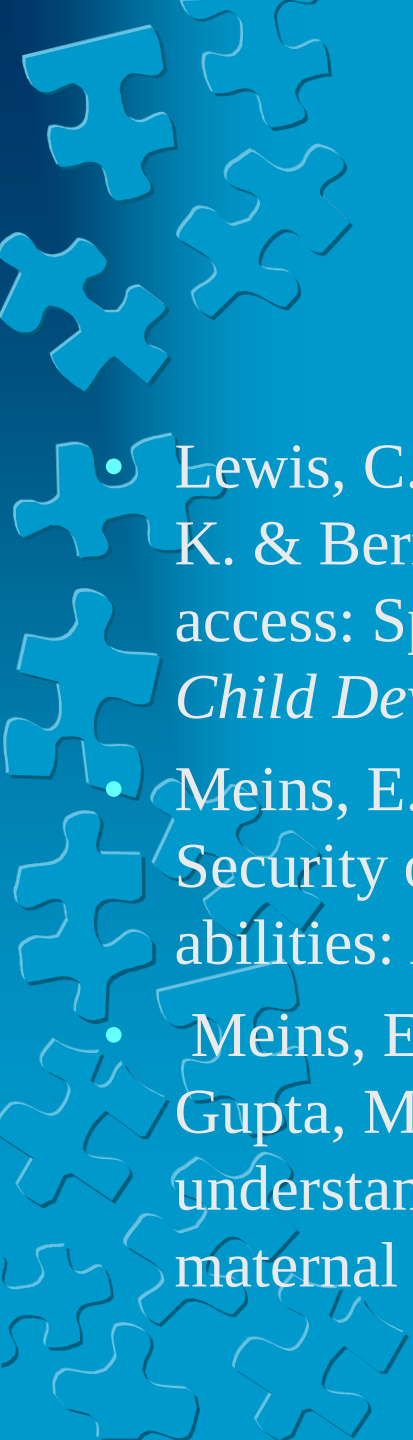
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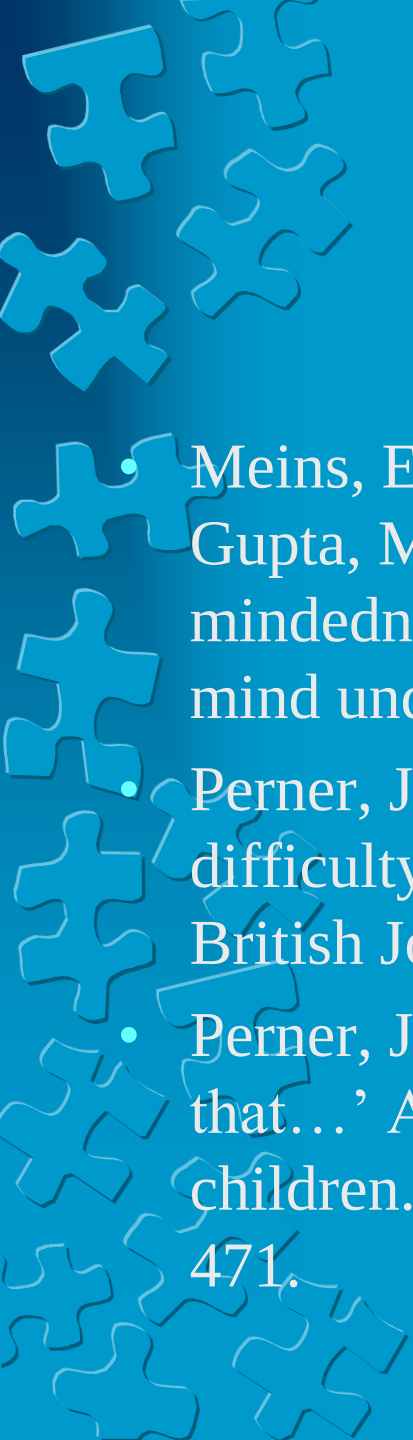
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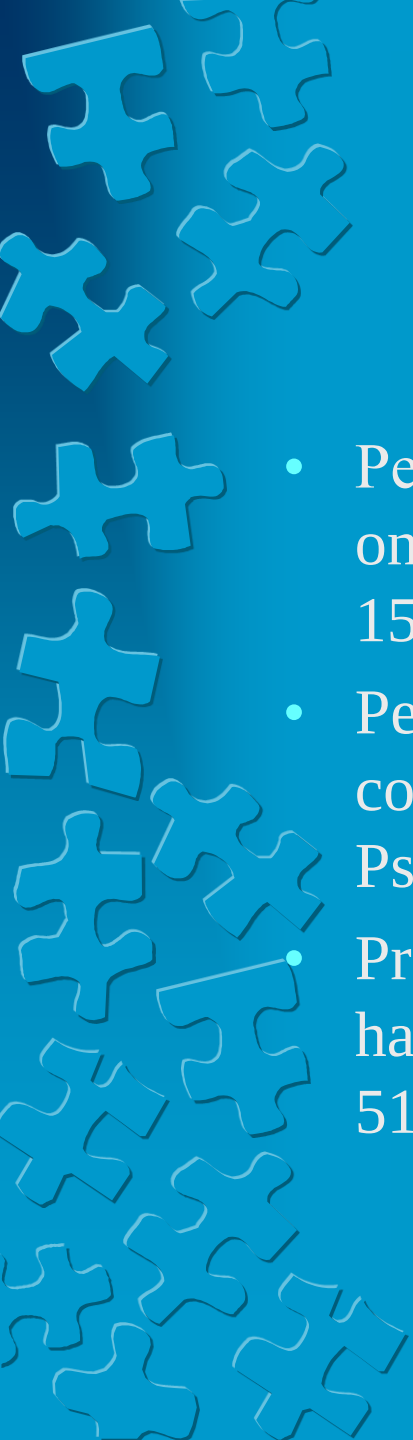
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Part two: Explaining Language Development



Nature or nurture?

- Is language natural to humans?

or

- Is language something humans happened to have learned?



Empiricism vs Nativism

- Empiricism - This extreme experience-based perspective argues that the mind at birth is like a blank slate (*tabula rasa*) to be written on by experience (Locke, 1690)
- Nativism - The assertion that knowledge cannot come from experience alone. The mind must have some structure in order to organise and interpret experience (Gleitman, 1995; Pinker, 1994).



The Nativist Perspective

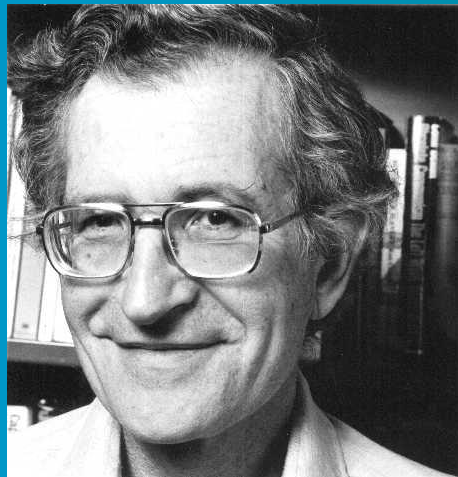
Nativist theories claim children

- learn language rapidly;
- learn language effortlessly;
- acquire language without direct instruction.
- Grammatical concepts are common to all languages, they are biologically predisposed.
- On hearing language we will form the rules.
- HOW?

The Nativist Perspective

“Language learning is not really something that the child does; it is something that happens to the child placed in an appropriate environment, much as the child’s body grows and matures in a predetermined way when provided with appropriate nutrition and environmental stimulation.”

(Chomsky, 1987, p.519)





Chomsky

- LAD contains the common grammatical concepts for all languages.
- Once the specific language rules are extracted by the LAD they allow for interpretation and development of future speech.



Behaviourism

- Imitation and reinforcement via shaping and reward...

But.....

- 'I goed', 'mouses'

- Skinner
 - systematic reinforcement (shaping)
- Role of the environment
 - impact of poverty



Bandura

- Via imitation and observation...
- But,
- Feedback is not related to grammar by to the type of speech production
- We are not shown how to apply grammatical concepts.

Interactionism

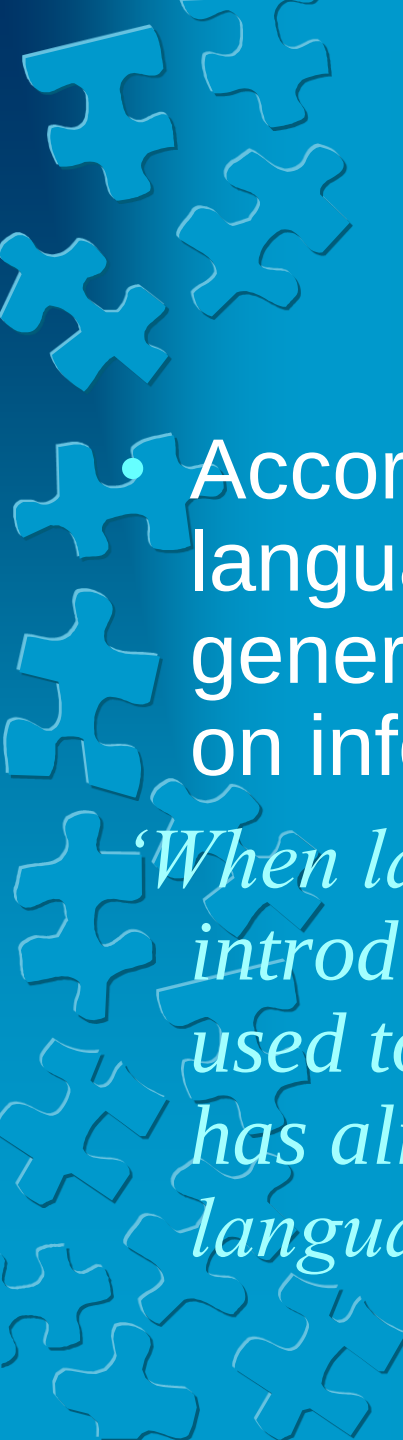
Interactionism claims;

Children-

- possess some innate cognitive skills which are required for language development but are not specifically linguistic.
- learn language through social interaction (e.g. Snow, 1989).
- And, Bruner- the use of scaffolding and motherese (LASS).
- Again direct feedback is rare and cannot explain how language occurs at the same rate across all cultures.

- 
- *‘We on the other side think learning is a long slog, which requires from the child a lot of work. We think it requires a relationship with an adult and a whole set of cognitive skills’*

(Snow, quoted in Rymer, 1993, p.37).



Constructivism

- According to constructivist theories, language is constructed by the child using general cognitive processes but operating on information provided by the environment

‘When language starts to come in, it does not introduce new meanings to the child. Rather it is used to express only those meanings the child has already formulated independently of language’ (Bowerman, 1985, p.372)

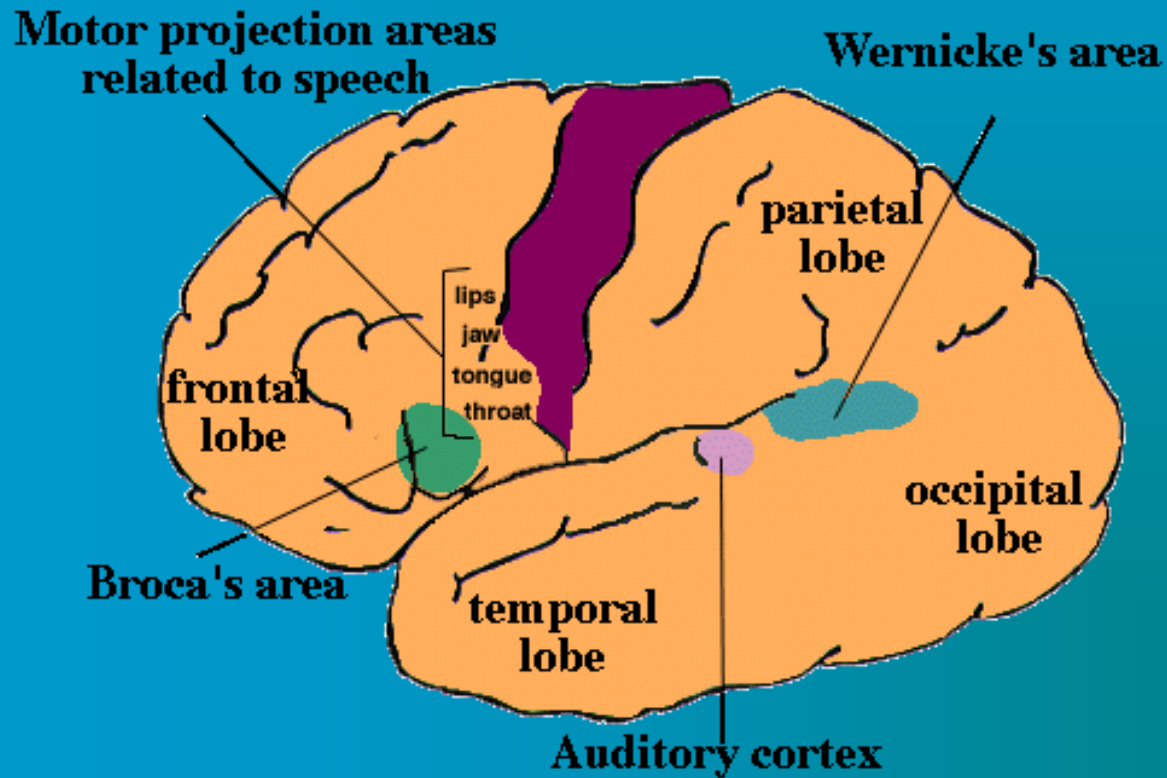


Vygotsky:

- Vygotsky believed that language is a tool to express thought and helps with the development of thought.
- I.e. language impacts on thought.
- How does this compare to Chomsky?

- 
- *Piaget saw the human child – and his mind- as an active, constructive agent that slowly inches forward in a perpetual bootstrap operation, Chomsky viewed the mind as a set of essentially preprogrammed units, each equipped from the first to realize its full complement of rules and needing only the most modest environmental trigger to exhibit its intellectual wares (Gardner, 1980, p.xxiii).*

The Human Brain and Language





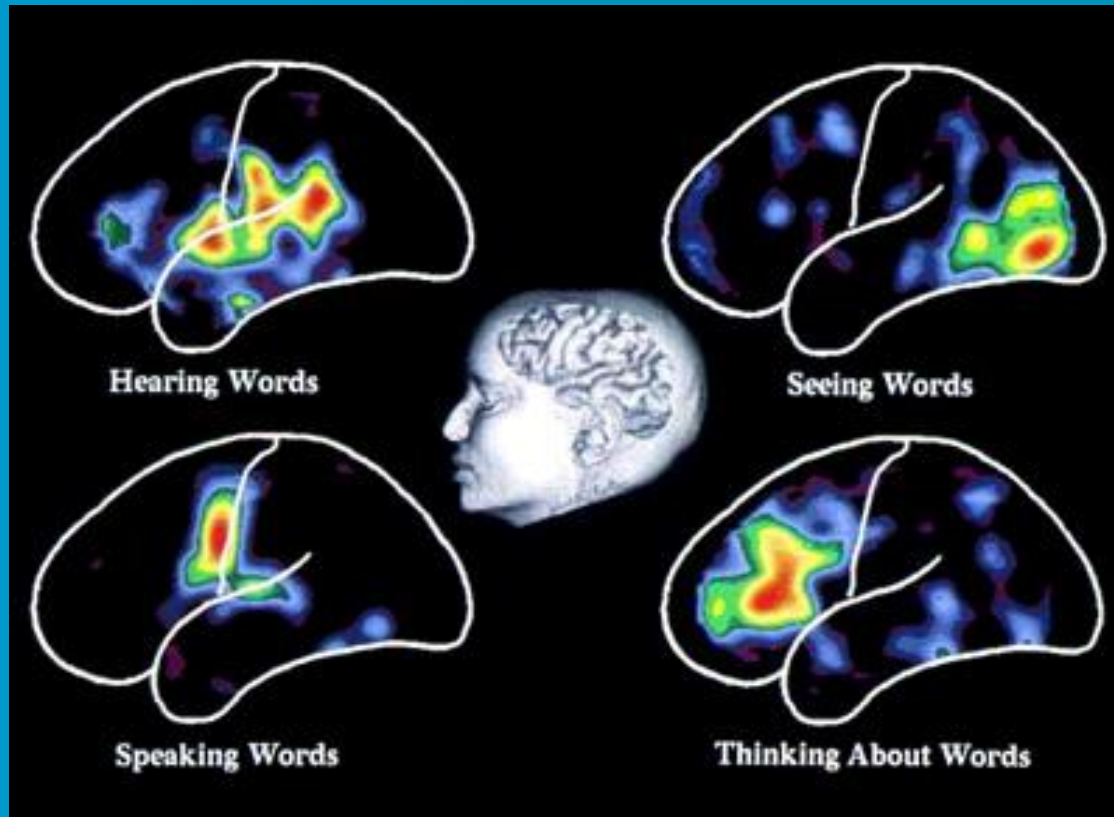
Methods of Neuro-linguistic Investigation

- Lesion method (e.g. Damasio, 1988)
- Split brain patients
- Dichotic listening tasks (e.g. Kimura, 1967)
- Event-related brain potentials (ERPs)
- Brain imaging techniques (e.g. PET; fMRI;)

Event related brain potentials (ERPs)



Positron Emission Tomography (PET)



Functional Magnetic Resonance Imaging (fMRI)

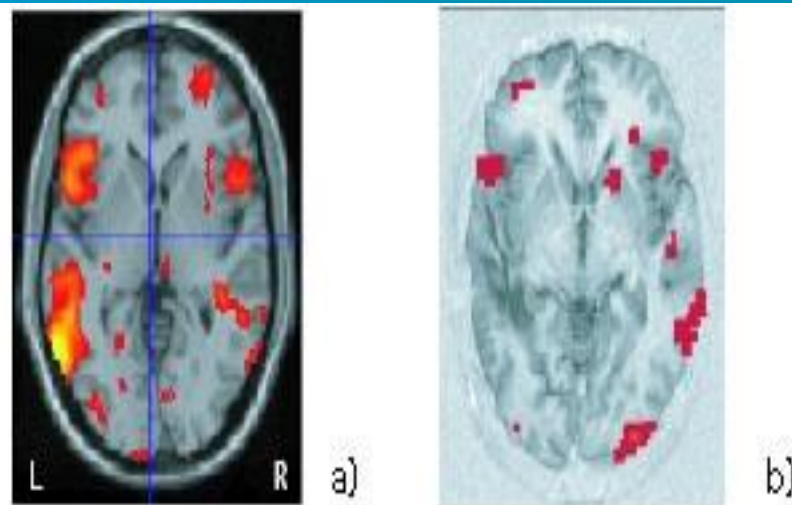


Fig.1 Activation from a sentence reading and word generation task in healthy subject (a) and in patient after a stroke in left temporal lobe (b).



Evidence of language as a left-hemisphere function

- Brain injury and aphasia
- Split brain patients
- Studies of undamaged adults
- Split brain patients and language

Brain injury and aphasia

- Aphasia refers to a condition in which language functions are severely impaired
- Many different types of aphasia (e.g. Broca's aphasia; Wernicke's aphasia)
 - Broca's aphasia – speech that consists of short strings of content words without grammatical morphemes.
Yes...ah...Monday...er...Dad and Peter H...and Dad...er...hospital...and...ah...Wednesday...Wednesday, nine o'clock... (Goodglass, 1979, p. 256)
 - Wernicke's aphasia – speech that is 'syntactically full but semantically empty' (Blumstein, 1988. p.203).
 - *'I feel very well. My hearing, writing been doing well. Things that I couldn't hear from. In other words I used to be able to work cigarettes I didn't know how...Chesterfeela, for 20 years I can write it* (Goodglass, 1993, p.86)

Evidence of language not exclusively as a left-hemisphere function

- Right hemisphere contribution to language
 - RH appears to control language to a greater extent in left handed individuals
 - RH plays a dominant role with regard to intonation patterns and some aspects of pragmatics (e.g. indirect requests, understanding sarcasm and jokes)
- Individual and sex-related differences
 - more bilateral participation shown by females
 - Right hemisphere contribution to language

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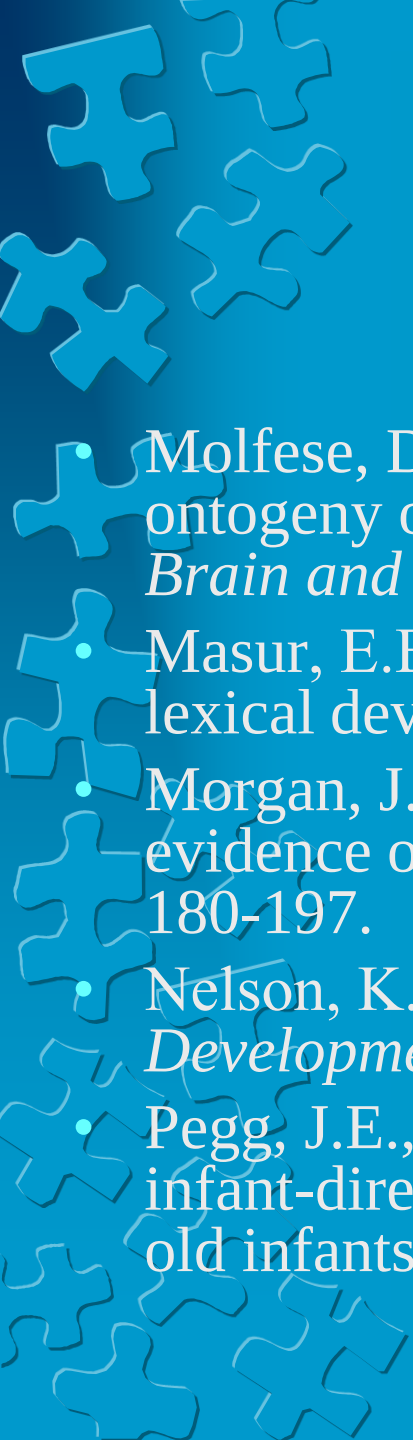
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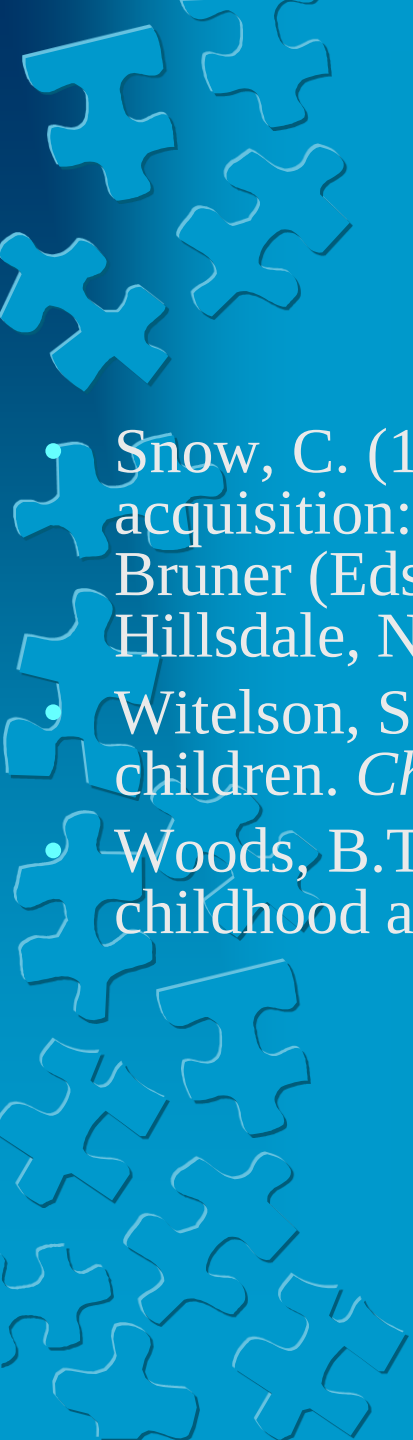


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