#1: Thurs April 26th
Theory of Mind

• Greg & Anton

• Yee-Ann & Bob

• Laura & Stephanie H.

#2: Tues May 1st
Number Sense

• Mike & Dominick

• Chris & Russell

• Andrea & Ashish

#3: Thursday May 3rd
Recursion & Evolution

• XX & YY (from Imogen, Nick, Achieng, Katherine)

• AA & BB
  More on recursion...

#4: Tuesday May 8th
Space and Orientation

• Mandy & Becca

• Stephanie L. & Jamie
Creativity of Human Language

- Animal communication systems have a fixed, limited range of messages (e.g. bee dance, bird song, monkey call)
- Human language is *infinitely* creative

**Terminology**

- Linguistic Relativity
- Sapir-Whorf Hypothesis

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**A Constraint on Interpretation**

\[ S \rightarrow S' \rightarrow S \rightarrow NP \rightarrow VP \rightarrow \text{While he was reading the book, John ate the apple} \]

**Neo-Whorfian Idea**

- Language does not simply allow us to *communicate* complex and novel ideas
- Language allows us to *represent* complex and novel ideas, i.e., language as an *enabler for thought*

**Language & Theory of Mind**

- The ability to represent and explain the beliefs, desires, intentions, etc. of others may rely on the ability to represent the syntax of complement clauses.
- Correlation: language devt. -> False belief tasks

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**Abbreviations**

- NP: Noun Phrase
- VP: Verb Phrase
- S: Sentence

**Representations**

- Comp while
- S

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**Contributors**

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False-belief Task

- The child is introduced to two puppets, Sally and Anne. While playing, Sally puts a marble into a basket and then goes outside (the puppet disappears under the table, for example). When Sally is not around, naughty Anne changes the location of the marble. She takes it out of the basket and puts it in a box. Some time later Sally comes back and wants to play with her marble.

Children are then asked the critical question: Where will Sally look for her marble?

- 3-year olds typically fail
- 4-5 year olds typically succeed
- Key problem in Autism

Early Language Development

- Two-year Olds
  - Talk a lot!
  - … about what they did, what they want
  - … about what other do
  - … possibly about what others say
  - … not about what others think

Early Language Development

- “The Mom said she bought apples. But look! She really bought oranges.”

  “What did the Mom say she bought?”

- 3-year olds: oranges
- 4-year olds: apples

Language and Theory of Mind

- Testing the Connection
  - Developmental closeness does not entail causality
  - Test development in normal children
  - Test development in language-delayed children
  - Test understanding in non-humans

Exact Number System

- 1, 2, 3, 4, 5, …
- … 1043, 1044, 1045, 1046 …
Sequences

• 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, ...

• A, B, C, D, E, F, G, H, I, J, K, ...

Quantities

1 2 3 4 5 6 ...

How Many?
More on LEFT or RIGHT?
Different Encodings of Quantity

- Exact quantity
- Approximate quantity
- Number sequence