Topic or concept: Intentional communication in nonhuman primates: Consensus and debate

Basic objectives for preparatory work:	Advanced objectives for classwork & after class work:
• Give examples of potentially "intentional" communication in chimpanzees • Recognize the characteristics of intentional communication • Define "Theory of Mind (ToM)" • Relate ToM to intentional communication • Recognize examples of ToM ability • Describe experimental study on ToM in chimpanzees	• Demonstrate how human communication is supported by ToM • Differentiate ToM from associative learning as bases of behaviors • Report some experimental studies on ToM in chimpanzee • Differentiate facts (design, procedures, results) from ideas (hypotheses, rationale, interpretation of results, claims) • Interpret the experimental results both in terms of ToM and associative learning • Assess the strengths and limitations of primate studies • Recommend a new method for studying primate cognition • Organize materials to write an original information piece

	Time planned	Activity and rationale	Resources needed
Beginning of class period	5 mins	• Quick Review of Pre-Class Quiz. Activate knowledge from preparatory activity and provide feedback.	• Results of Pre-Class Quiz
Middle of period	15 mins	• Mini-lecture based on Pre-Class Quiz results. Clarify misconceptions. Provide new information.	• Lecture slides
Middle of period	20 mins	• Think aloud pair Q-A. Practice explaining concepts and information learned from preparatory activities.	• A sequence of question
Middle of period	30 mins	• Mini (2-3 min.) group presentation. Practice collaboration. Apply the concept learned from preparatory activity to a new case study. Locate a relevant information online. Practice oral communication to peer audience. Take and answer questions.	• Slide template shared to all students (e.g., Google slide) • Laptop or tablet

End of period	5 mins	• Summarize, connect, and comment. Solidify understanding in preparation for doing advanced work at home.	• 1-2 pages slides

Flipped BEFORE CLASS Work Plan Template

Basic learning objectives	Activity and rationale	Instructions to students
• Give examples of potentially "intentional" communication in chimpanzees • Recognize the characteristics of intentional communication • Define "Theory of Mind (ToM)" • Relate ToM to intentional communication • Recognize examples of ToM ability • Describe experimental study on ToM in chimpanzees	• Read a target article. Students will acquire the requisite concepts and terminology necessary to follow the in-class mini lecture, discussions, and group activities. • View two short videos: (1) This helps student solidify understanding of abstract concepts with illustrations. It also enables students to observe laboratory studies. • On-line quiz. Obtain formative assessment data. Obtain information for in-class Quick Review.	• Read "Theory of Mind" article from Course Reader. Key concepts and terms will be tested in Quick Quiz, so take notes as you read. • Then watch two YouTube videos from Canvas links: (1) https://www.youtube.com/watch?v=NBFBbFcixRY and (2) https://www.youtube.com/watch?v=1s0dO_h7q7Q. From the first video, observe how chimpanzees communicate in nature; in the second video, observe how researchers examine primate cognition through lab experiments. • Finally, take the Quiz from Canvas before it closes on [date/time]. You can take it up to three times, and the highest score will be logged as your Quiz score.

Flipped AFTER CLASS Work Plan Template

Advanced learning objective	Activity and rationale	Instructions to students
• Demonstrate how human communication is supported by ToM • Differentiate ToM from associative learning as bases of behaviors • Report some experimental studies on ToM in chimpanzee • Differentiate facts (design, procedures, results) from ideas (hypotheses, rationale, interpretation of results, claims) • Interpret the experimental results both in terms of ToM and associative learning • Assess the strengths and limitations of primate studies • Recommend a new method in study of primate cognition • Organize materials to write an original information piece	• Write an informative paper on current consensus and debates on nonhuman primates' ability to use intentional communication. This formal write-up enables students to practice all elements of the advanced learning objective through outlining, drafting, revising and editing the paper.	As a culmination of your learning, write a 750-words essay, where you will examine current consensus and debates on the question of whether nonhuman primates can use vocal signals intentionally as humans do. Specifically, you will (1) **explain the concept** of "intentional communication" and its cognitive prerequisite; (2) **demonstrate, with a brief example**, how humans use intentional communication; (3) **report one laboratory test** on ToM with chimpanzees; (4) discuss (a) **the consensus and debate** on ToM in chimpanzees and (b) what **methodological change(s) you might propose** to tease apart two competing interpretations. In your discussion, be sure to **explain** how the current results can be explained both in terms of ToM and associative learning. **Use only course materials** as sources of information.

GUIDED PRACTICE

Class: Linguistics 123—Sound and Communication
Date assigned: Wednesday in week 9 (e.g., October 16, 2019)
Date due: The following Monday (e.g., October 21, 2019) at 5:00 pm
Time estimate to complete this assignment: 1 to 1.5 hours

Overview/Introduction

In this lesson, we will extend our previous knowledge on animal cognition that supports communication. Using our closest primate cousins, chimpanzees, as an example, we will ask whether chimpanzees can use vocal signals intentionally as humans do. Previously, we defined the term "communication", to which we will add new concepts "intention" and "Theory of Mind (ToM)" as a cognitive requisite for intentional communication. Our key question is: how do we know if chimpanzees have ToM? We will review a couple of experimental studies that tested ToM in chimpanzees, and examine how the animals' responses can be interpreted in different ways, yielding different answers to the question.

Studying ToM in chimpanzees gives us important clues on the origin of human language—how much is shared by other animal communication system and how much (if there is any) is uniquely human. We will also learn a process of scientific inquiry, which you can apply to any of your own investigation in the future.

Learning Objectives

Basic objectives

Each student is responsible for learning and demonstrating proficiency in the following objectives prior to the class meeting. The Canvas Quiz will cover these objectives.

- Recognize the characteristics of intentional communication
- Define "Theory of Mind (ToM)"
- Recognize key components of ToM

Advanced objectives

- Relate ToM to intentional communication
- Recognize features of experimental study on ToM in chimpanzees
- Differentiate animal behaviors based on ToM from those based on associative learning

Preparatory Activities and Resources:

Resources

Reading: Read "Theory of Mind" article (Pearce, 2008, pp. 312-319) from Course Reader. Key concepts and terms will be tested in Quick Quiz, so take notes as you read.

Viewing: Watch the following YouTube videos from Canvas links. These have a total running time of 7 minutes, 35 seconds:

- How to speak chimpanzee | BBC Earth (3:58) https://www.youtube.com/watch?v=NBFBbFcixRY

- Humans aren't the only great apes that can 'read minds' | Science Magazine (3:37) https://www.youtube.com/watch?v=1s0dO_h7q7Q

Quiz

A Quiz can be taken from Canvas after reading and video watching. It consists of ten multiple-choice questions, that are intended to help you confirm your proficiency of basic objectives as stated above. **You must take the Quiz before it closes on Monday, October 21, at 5:00 pm**. You can take the Quiz up to three times, and the highest score will be logged as your official Quiz score.

Questions?

Bring questions to Monday's class. If you need more help, you can come see me during my regular office hours (M/W: 12:00-1:00 pm) or by appointment.

ADVANCED PRACTICE

Class: Linguistics 123—Sound and Communication
Date assigned: Wednesday in week 10 (e.g., October 23, 2019)
Date due: Wednesday in two weeks (e.g., November 6, 2019)
Time estimate to complete this assignment: 3 hours

Learning Objectives

Advanced objectives

- Differentiate ToM from associative learning as bases of behaviors
- Differentiate facts (design, procedures, results) from ideas (hypotheses, rationale, interpretation of results, claims)
- Assess the strengths and limitations of primate studies
- Recommend a new method for studying primate cognition

Activities & deliverables

1. As a culmination of your learning, write a 750-words essay, where you will examine current consensus and debate on the question of whether nonhuman primates can use vocal signals intentionally as humans do. Specifically, you will (1) **explain the concept** of "intentional communication" and its cognitive prerequisite; (2) **demonstrate, with a brief example**, how humans use intentional communication; (3) **report** one laboratory test on ToM with chimpanzees; (4) discuss (a) **the consensus and debate** on ToM in chimpanzees and (b) what **methodological change you might propose** to tease apart two competing interpretations. In your discussion, be sure to **explain** how the current results can be explained both in terms of ToM and associative learning. **Use only course materials** as sources of information.
2. After the bibliography, add a short **reflection** (75 - 100 words) on this section's learning. What did you find most interesting or important? Why? What was the easiest part of the assignment? What was the hardest part? Did the resources and in-class activities sufficiently prepare you for the task? Feel free to add any comment.
3. This Essay is due Wednesday, November 6, at 8:15 am (15 min. before class begins) through Canvas. For submission, you should convert your working file to pdf. Be sure to confirm successful submission before it is due.

Resources:

- Reading in Course Reader: Pearce, J. M. (2008). Theory of mind. In *Animal Learning & Cognition* (pp. 312-319). New York, NY: Psychology Press.
- Video 1: How to speak chimpanzee | BBC Earth (3:58) https://www.youtube.com/watch?v=NBFBbFcixRY
- Video 2: Humans aren't the only great apes that can 'read minds' | Science Magazine (3:37) https://www.youtube.com/watch?v=1s0dO_h7q7Q

Questions?

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