Theory of Mind

Instructor Manual

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The purpose of this instructor's manual is to facilitate teaching of the Theory of Mind (ToM) module. It is assumed that this will be students' first exposure to the topic. This manual consists of an outline of the chapter and a general framework for teaching the topic. In addition, there are suggestions for specific activities, discussion questions, and outside resources that may be useful to enhance this lesson. Finally, a PowerPoint slide presentation is available to use as a basis for teaching this unit.

Learning Objectives

- **Relevant APA Learning Objectives (Version 2.0)**
    - Describe key concepts, principles, and overarching themes in psychology (1.1)
    - Build and enhance interpersonal relationships (3.2)
    - Adopt values that build community at local, national, and global levels (3.3)
- **Content Specific Learning Objectives:**
    - Explain what ToM is.
    - Enumerate the many domains of social life in which ToM is critical.
    - Describe some characteristics of how autistic individuals differ in their processing of others' minds.
    - Describe and explain some of the many concepts and processes that comprise the human understanding of minds.

- Have a basic understanding of how ordinary people explain unintentional and intentional behavior.

Abstract

One of the most remarkable human capacities is to perceive and understand mental states. This capacity, often labeled “theory of mind,” consists of an array of psychological processes that play essential roles in human social life. We review some of these roles, examine what happens when the capacity is deficient, and explore the many processes that make up the capacity to understand minds.

Class Design Recommendations

This topic may be taught in one long class period (75-90 minutes) or two short class periods (50-60 minutes each). Dividing the topic into two class periods would enable more in-depth discussion of each of the components of theory of mind. When teaching this as a two-class unit, it is recommended to end the first class after reviewing the hierarchical organization of the component processes of ToM. The second class will cover each of the components within the hierarchy, and how people explain others’ behaviors.

An Example of a One-Class Lesson

- Introduction to ToM
- What is ToM?
- Why do we need ToM?
    - The need for ToM in social interactions
    - The automatic nature of ToM processing (in neurotypical populations)
- How is ToM different in individuals with autism?
- What processes comprise ToM?
    - Hierarchical organization of component processes

    - Agents, goals, & intentionality
    - Imitation, synchrony, and empathy
    - Joint attention, visual perspective taking
    - Projection, simulation, and egocentrism
    - Explicit mental state inferences
- How do people explain others' behaviors?
- Classroom Assessment Technique (CAT): "muddy" points

Module Outline

Introduction: Thinking about others' minds is fundamental for a variety of aspects of human functioning, including social interactions, language development, and moral reasoning. It develops gradually over the course of childhood, though it has a long evolutionary history.

What is ToM?

- The capacity to think about and reason about other people's minds is known as Theory of Mind.

Why do we Need ToM?

- The need for ToM in social interactions
    - ToM is critical for normal human social interaction because it helps us make sense of other people's actions (which would otherwise seem like a random set of movements), and it helps us make predictions about how other people are likely to respond to our words and actions.
- The automatic nature of ToM processing (in neurotypical populations)
    - Most people do this quickly and automatically, without even thinking about it.

How is ToM different in individuals with autism?

- People who have autism experience difficulties with ToM. Unlike neurotypical individuals who quickly and easily make sense of the mental states underlying other people's actions, people with autism do not seem to automatically make these inferences. Thinking about what happens when ToM is limited (as in the case of autism) helps us understand how important ToM is for normal human functioning.

What processes comprise ToM?

- Hierarchical organization of component processes
    - ToM is organized into a hierarchy of component processes. At the lower end of the hierarchy are more automatic low-level components, which even other animal species seem to be capable of. As we move up the hierarchy, processes become more complex, effortful, are achieved at later ages within human development, and become more exclusive in terms of who achieves this capacity within the animal kingdom.
- Agents, goals, and intentionality
    - The lowest level of the hierarchy consists of the understanding that some entities are agents (meaning they have the capacity to act on their own; e.g., humans, dogs, or apes) while others are not (e.g., cars, rocks, dolls). Even very young babies seem to appreciate the difference between agents and non-agents. By the end of their first year, babies also appreciate that agents have goals, and that these goals are the driving forces behind their actions. Somewhat later in development, young children begin to understand the concept of intentionality—the notion that even goal-directed actions vary as to whether they are intended vs. unintended. In order for an action to count as intentional it must be consistent with the wished-for outcome—based on skill and reasonable knowledge about how to achieve the wished-for outcome.
- Imitation, synchrony, and empathy
    - The next level in the hierarchy consists of imitation, synchrony, and empathy. Mimicry is an automatic kind of imitation. When people imitate one another, they reach a state of synchrony. Synchrony has been linked to increased liking, and better enjoyment of social interactions. Imitation may also lead to automatic empathy, as mimicking the body language or facial expressions of another person can trigger the feeling that the

other is experiencing in oneself.

- Joint attention, visual perspective taking
    - The next highest level on the hierarchy consists of joint attention (the process of mutually focusing on the same thing), which is critical for language learning. This level of the hierarchy also includes visual perspective taking (when one thinks about how a scene would look from another person's point of view).
- Projection, simulation, and egocentrism
    - Moving to the next level of the hierarchy, simulation involves putting yourself in another person's mental shoes. Some have argued that this is done via projection (assuming that the other person is "like me" and would think/act/feel as "I" would).
- Explicit mental state inferences
    - Finally, the peak of the hierarchy involves explicit mental state inference—or reasoning about the mental states of other people. This ability is typically tested using the false-belief test, which assesses whether an individual can put aside his/her own knowledge to reason from another character's perspective.

How do people explain others' behaviors?

- In everyday life, people are constantly trying to come up with explanations for why people act/think/say what they do. Most people are quite good at this, and quickly and automatically generate reasonable expectations for behavior based on the processes within the hierarchy.

Difficult Terms

Agents
Autism
Automatic empathy
Empathy

False belief
Intentionality
Joint attention
Mimicry
Mind reading
Projection
Social projection
Synchrony
Theory of mind
Visual perspective taking

Lecture Frameworks

Overview

This lecture framework is based on a single long lecture period (lasting 75-90 minutes). It can be broken into two lectures, with more time dedicated to covering each of the component processes in depth. A good place to break for a two-class unit on ToM would be after explaining the hierarchical nature of the component processes that make up ToM.

ToM can be a fun topic to teach, but it may be difficult for some students to appreciate the important or interesting nature of mind reading (as it comes so automatically to most students). To address this challenge, it can be helpful to emphasize how important theory of mind is for normal human functioning. Drawing connections between the material and students' personal experiences is helpful in improving student interest and comprehension of the material. In addition, discussing developmental trends in theory-of-mind development (including showing videos of children failing theory of mind tests) can spark discussion. It can also be interesting to discuss comparative psychology literature on nonhuman animals' theory-of-mind capacities. Finally, the topic of theory of mind is a good tie-in to discuss the differences in processing between neurotypical individuals and individuals with autism.

- **Warm-up Activity:** Begin by showing students a video used in Heider and Simmel (1944), which shows geometric shapes moving; participants in the study and most people who view the video tend to automatically view the animated geometric shapes' actions in terms of theory-of-mind concepts (such as goals, intentions, or traits). The video can be found at: https://www.youtube.com/watch?v=76p64j3H1Ng. Have students write down what happened in the video. Use this as a jumping off point to discuss how humans have a tendency to focus on the underlying mental causes of behavior and not to see actions as

random.

- **Direct Instruction and Discussion of the Introduction to ToM**
    - Refer to the slides to address the following topics:
        - What is ToM?
        - Why do we need ToM?
        - How is ToM different in individuals with autism?
            - Varied severity
            - Varied symptoms

- **Video and Discussion of ToM and Autism**
    - Show a video illustrating the challenges individuals with autism face with theory of mind. Show the first 5:47 of My life with Asperger's: Daniel Wendler at TEDx University of Arizona (https://www.youtube.com/watch?v=B-xgdqNtcDI).
    - After the video is presented, ask students:
        - How do deficits in theory-of-mind processing impact the social lives of individuals with autism spectrum disorders? Discuss the numerous facets of life where mindreading is required (family, school, work, etc.).
        - Temple Grandin is a well-known activist and author who has autism. She has described herself as “an anthropologist from Mars.” Why do you think she uses this phrase to describe her experiences in social interactions? Use students’ responses as a way to discuss differences in theory-of-mind processing between individuals who do and do not have autism.

- **Direct Instruction of What Processes Comprise ToM**
    - Refer to the lecture slides to explain the slides in the section *What processes comprise ToM.*
    - Topics to discuss will include:

    - Recognizing agents and goals
    - Intentionality
    - Imitation, synchrony, and empathy
    - Joint attention
    - Visual perspective taking
    - Egocentrism
    - Mental state inference

- **Curse of Knowledge—Theory of Mind Test for Adults Activity:**Birch & Bloom (2007) developed a variation of the standard Sally-Ann task that is challenging even for adults to complete. Participants hear a story about a character who leaves her violin in one of several locations, then leaves the room, at which point another character moves the violin. The task is to answer what is the probability that the original character will search in each of the locations first. Have students complete the test first. Use the activity as a means for discussing how ToM isn't perfect in adults and use it as a transition to the final point of the module (e.g., the need to explain behavior, even when sometimes erroneous).

- **Direct Instruction—How Do People Explain Others' Behavior?**

    - Refer to lecture slides *How do people explain others' behavior*.

        - Humans seem to have a need to understand why people do what they do (from small, inconsequential actions to significant life-changing behaviors).

- **Theory of Mind in Action Activity:**Have students complete the "Theory of Mind in Action" activity. For this activity, students practice separating observations of overt behavior from theory-of-mind assumptions about the underlying causes of the observed behavior. Use this as a means for reviewing key points from the unit, including the automatic nature of ToM reasoning and the component processes of ToM.

- **CAT:**Assess students' understanding of the material in this lesson by having them write down their "muddiest point." Invite students to share their muddiest points, then use the remaining class time to review them.

Activities & Demonstrations

The Curse of Knowledge: Theory of Mind Test for Adults

- Time: 10 minutes
- Materials: A copy of Birch, S.A. & Bloom, P. (2007). The curse of knowledge in reasoning about false beliefs. *Psychological Science*, *18,* 382-386. doi:10.1111/j.1467-9280.2007.01909.x
- Directions:
    - Students are asked to pretend they were research participants in this study; they listen to the story vignette and respond as if they were participants (by estimating the probability that the character will look in each possible location *first*).
    - Next, the instructor explains what the researchers found.
    - Students are then asked two discussion questions:
        - Were you surprised by the results? Why or why not?
            - Discuss how even adults are not always very good at ToM.
        - How might this bias impact social interactions in the real world?
            - Discuss how people tend to think they understand the minds of others better than they actually do; can also discuss how this impacts interpersonal relationships, work interactions, diplomatic relations, etc.

Theory of Mind in Action Activity

- Time: 15 minutes
- Materials: Observation chart
- Directions:

1. Have students do this activity during class time or as a homework assignment.
2. Students complete an observation; this would ideally be done in a live setting but it could also be done while watching a TV show or a movie.
3. Students then complete an observational chart in which they practice separating the observed behavior from the interpreted underlying meaning.
4. The chart should have the following sections:

- Discussion questions follow the completion of the observation:

Describe what was observed (without using mental terms)	*Explain why the person did this. What were the underlying mental causes? (use ToM concepts and terms in your answer)*

Chart Example

  - How easy was it to separate observing overt behaviors from interpreting them? What does this suggest about theory of mind?
    - Use student responses to discuss the automatic nature of theory of mind.
  - What elements of theory of mind did YOU use to complete this activity?
    - Use student responses to review the component processes in the hierarchy.

Additional Activities

Vacha-Haase, T. (1996). A child panel to facilitate the instruction of child development. *Teaching of Psychology, 23*, 170-171. doi:10.1207/s15328023top2303_7

- This article has suggestions for bringing children of various ages into class to illustrate the developmental differences students are learning about from the lecture/textbook material. Seeing children of various ages attempt various aspects of ToM could be a valuable addition to this lesson. Alternatively, students could try out ToM tasks with children of various ages as a homework assignment and share their results in class.

Nigro, G. N. (1994). Create-a-children's game: An exercise for developmental psychology classes. *Teaching of Psychology, 21,* 243-245. doi:10.1207/s15328023top2104_11

- Students are tasked with creating a developmentally appropriate game and explaining why the game is appropriate for a given age group. This assignment could be modified to ask students to create a game to help neurotypical or autistic children (or adults) practice ToM.

Discussion Points

1. Think back to the last time you experienced a conflict. Explain what happened in terms of theory-of-mind concepts. How was the conflict resolved?

    - This question is aimed at helping students review the components of ToM and relate them to personal experiences.

2. What would happen if all people suddenly lost their ability to make sense of other people's minds and mental states?

    - This question is aimed at getting students to appreciate how important ToM is to normal human functioning (indeed, it forms the basis for human society).

3. Temple Grandin is a well-known activist and author who has autism. She has described herself as "an anthropologist from Mars." Why do you think she uses this phrase to describe her experiences in social interactions?

    - This question is designed to help students appreciate the different experience that individuals with autism have when thinking about ToM concepts.

4. What are some activities that teachers or parents could use to promote theory-of-mind development in children (for example, reading stories and asking children to think about what the characters in the stories are thinking or feeling)?

    - This question can be used as a jumping-off point to discuss how young children's failure to appreciate different aspects of ToM can lead them to cause harm to others, and to

get students thinking about what experiences might lead children to master the various concepts that make up ToM.

Outside Resources

Blog: On the debate about menstrual synchrony
http://blogs.scientificamerican.com/context-and-variation/2011/11/16/menstrual-synchrony/

Blog: On the debates over mirror neurons
http://blogs.scientificamerican.com/guest-blog/2012/11/06/whats-so-special-about-mirror-neurons/

Book: First and last chapters of Zunshine, L. (2006). Why we read fiction: Theory of mind and the novel. Columbus, OH: Ohio State University Press.
https://ohiostatepress.org/Books/Book PDFs/Zunshine Why.pdf

Movie: A movie that portrays the social difficulties of a person with autism: Adam (Fox Searchlight Pictures, 2009)
http://www.imdb.com/title/tt1185836/?ref_=fn_tt_tt_1

ToM and Autism TEDx Talks
https://www.ted.com/playlists/153/the_autism_spectrum

Video: TED talk on autism
http://www.ted.com/talks/temple_grandin_the_world_needs_all_kinds_of_minds.html

Video: TED talk on empathy
http://blog.ted.com/2011/04/18/a-radical-experiment-in-empathy-sam-richards-at-ted-com/

Video: TED talk on theory of mind and moral judgment
http://www.ted.com/talks/rebecca_saxe_how_brains_make_moral_judgments.html

Video: Test used by Baron Cohen (prior to the core study) to investigate whether autistic children had a theory of mind by using a false belief task.
https://www.youtube.com/watch?v=jbL34F81Rz0

Video: Theory of mind development
http://www.youtube.com/watch?v=YiT7HFj2gv4, http://www.youtube.com/watch?v=YGSj2zY2OEM

Evidence-Based Teaching

Riggio, H. R., & Garcia, A. L. (2009). The power of situations: Jonestown and the fundamental attribution error. *Teaching of Psychology, 36*, 108-112. doi:10.1080/00986280902739636

- The lesson about ToM could be enhanced by drawing connections to the social psychology principle of the fundamental attribution error (the tendency to overestimate how much a person's behavior is driven by internal traits and underestimate how much a person's behavior is driven by external influences). One way to do this would be to use the approach recommended by Riggio and Garcia (2009): showing students a documentary about the Jonestown tragedy (or another case study in which individuals may initially have the instinct to "blame the victim").

Viney, W., & Woody.D. (1995). Psychogeny: A neglected dimension in teaching the mind-brain problem. *Teaching of Psychology* 22, 173-77. doi:10.1207/s15328023top2203_2

- This paper reviews a method for teaching college students about the mind-brain connection. Two competing theories are discussed. Discussing the mind-brain connection could be an interesting addition to a unit on theory of mind.

Links to ToPIX Materials

Books:
http://topix.teachpsych.org/w/page/39234155/Development

Books:
http://topix.teachpsych.org/w/page/39236320/Social-Psychology

Video/Audio:
http://topix.teachpsych.org/w/page/19980979/Cognition%20Video

Teaching Topics

Teaching The Most Important Course
https://nobaproject.com/documents/1_Teaching_The_Most_Important_Course.pdf

Content Coverage
https://nobaproject.com/documents/2_Content_Coverage.pdf

Motivating Students
https://nobaproject.com/documents/3_Motivating_Students_Tips.pdf

Engaging Large Classes
https://nobaproject.com/documents/4_Engaging_Large_Classes.pdf

Assessment Learning
https://nobaproject.com/documents/5_Assessment_Learning.pdf

Teaching Biological Psychology
https://nobaproject.com/documents/6_Teaching_Bio_Psych.pdf

PowerPoint Presentation

This module has an associated PowerPoint presentation. Download it at https://nobaproject.com//images/shared/supplement_editions/000/000/161/Theory%20of%-20Mind.ppt?1475874902.

About Noba

The Diener Education Fund (DEF) is a non-profit organization founded with the mission of re-inventing higher education to serve the changing needs of students and professors. The initial focus of the DEF is on making information, especially of the type found in textbooks, widely available to people of all backgrounds. This mission is embodied in the Noba project.

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- To reduce financial burden on students by providing access to free educational content
- To provide instructors with a platform to customize educational content to better suit their curriculum
- To present material written by a collection of experts and authorities in the field

The Diener Education Fund is co-founded by Drs. Ed and Carol Diener. Ed is the Joseph Smiley Distinguished Professor of Psychology (Emeritus) at the University of Illinois. Carol Diener is the former director of the Mental Health Worker and the Juvenile Justice Programs at the University of Illinois. Both Ed and Carol are award- winning university teachers.

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