Teaching Interpretive Theory of Mind through ambiguous figures

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Interpretive Theory of Mind

- Interpretive theory of mind is the “commonsense understanding that the mind itself influences how the world is experienced” (Carpendale & Lewis, 2006, p. 193).
- The understanding of an interpretive theory of mind is associated with improved cognitive and interpretive skills as well as better social understanding (Luckett et al., 2002).
- In testing whether children have an interpretive theory of mind, researchers sometimes use ambiguous figures where there can be at least two interpretations that are equally legitimate.
- If a person can acknowledge “that a single figure allows multiple interpretations, that is tantamount to appreciating that one mind could impose one interpretation and another mind could impose a different interpretation” (Ropar et al., 2003, p. 388).
A classic example of an ambiguous figure is Jastrow’s (1900) image which can be perceived as a duck or a rabbit:

Study this image for several seconds and see if you can perceive one image and then the other. When you are able to switch from one interpretation to the other, this is called a ‘figure reversal’.
Activity 1: Understanding Ambiguous Figure Reversals

- The ability to recognize that a single object or picture can have multiple interpretations is likely a developmental precursor to a more advanced understanding of an interpretive theory of mind (Doherty & Wimmer, 2005; Lalonde & Chandler, 2002; Wimmer & Doherty, 2011).

- It is also a transferrable skill that may apply to other areas involving the understanding of alternative interpretations (e.g., understanding homonyms or false beliefs) (Ropar et al., 2003; Wimmer & Doherty, 2011).

- The purpose of this activity is to introduce the student to ambiguous figures and gauge the student’s ability to perform figure reversals using several levels of prompting.
Activity 1: Instructions

• Tell the child “I am going to show you some pictures and I want you to tell me what you see”. Present the first figure (they are arranged so the first ones tend to be easier than the later ones).

• In the initial levels of prompting, the child is NOT informed about the ambiguity. This is important to determine whether the child can spontaneously reverse the image without explicit instruction.

• If at any level of prompting, the child reports both interpretations (e.g., duck and rabbit), a check is performed. Ask him to point out the distinctive parts of each interpretation by saying:
  • “Yes, that can be a duck. Show me how. Where is the beak?”
  • “Yes, it can also be a rabbit. Show me how. Where are the ears?”

Finally, confirm the child’s interpretation by revealing the disambiguating images on the following page.
Activity 1: Prompting Levels

PROMPTING LEVELS: “What do you see?” If the child reports only one interpretation, say:

1. “I want to see if you can look at the picture for as long as I say. Are you ready? Ok. Look.” After 5 seconds, say “Ok. What is that? What do you see?”
2. If the child still reports one interpretation, repeat the above procedure using a 10 second looking interval.
3. If the child still reports one interpretation, say “Let’s look together. You said this looked like a [child’s interpretation here] but it can also look like something else. What else can this be a picture of?”
4. If the child still reports one interpretation, say “That’s funny. For me that picture can be a [give the two interpretations] duck or a rabbit. Can you see a duck and a rabbit?”
5. If the child still reports one interpretation, move to the next page and reveal the two interpretations being sure to point out the distinctive parts of each (e.g., the rabbit’s ears, the duck’s beak).

Repeat these steps for multiple ambiguous figures until you feel the child is capable of performing object reversals.
What do you see?

Jastrow (1900)
What else can this be a picture of?

Jastrow (1990); Sobel, Capps, & Gopnik, (2005)
What do you see?

[Image of a sketch of a dog's head]

Wimmer & Doherty (2009)
What else can this be a picture of?

Wimmer & Doherty (2009)
What do you see?

Kietzmann, Geuter, & König (2011)
What else can this be a picture of?

Kietzmann, Geuter, & König (2011)
What do you see?

Kietzmann, Geuter, & König (2011)
What else can this be a picture of?

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What else can this be a picture of?

Kietzmann, Geuter, & König (2011)
What do you see?

Kietzmann, Geuter, & König (2011)
What else can this be a picture of?
What do you see?

Rubin (1915)
What else can this be a picture of?

Rubin (1915)
What do you see?

Shaquiri, Anderson, & Danckert (2013)
What else can this be a picture of?

Shaquiri, Anderson, & Danckert (2013)
What do you see?

Thomson (2009)
What else can this be a picture of?
What do you see?
What else can this be a picture of?

What do you see?

Necker (1832)
What else can this be a picture of?

Necker (1832)
What do you see?

(Williams, 1998)
What else can this be a picture of?

(Williams, 1998)
Activity 2: Understanding Interpretive Diversity through Inkblots

- Understanding that there can be more than two interpretations of an ambiguous abstract image likely requires a more sophisticated understanding of interpretive diversity.

- For this activity, print copies for the student(s) and have them “Write down what you see”. Students can also draw additional details (or identify different parts of an image, e.g., “arm”, “leg”) to make their interpretations obvious to others.

- The inkblot activity is a great group activity as it can inspire a number of diverse interpretations! You can even use this activity to explore the reasons behind others’ interpretations.
  - Do you ever think that what someone ‘sees’ has anything to do with that person’s likes, dislikes, or interests?
  - Pick someone who you think had a creative or imaginative interpretation and ask them to explain how they came up with it.
  - Are there some pictures that everyone agreed on? Which ones? Why might that be?
What do you see?
What do you see?
What do you see?
What do you see?
What do you see?
What do you see?
What do you see?
What do you see?
What do you see?
What do you see?
Activity 3: Understanding interpretive diversity through Droodles

• Like Inkblots, Droodles (Lalonde & Chandler, 2002) can inspire an unlimited number of interpretations.

• Our modified Droodle task involves developing an interpretation based on a partial view of a larger image. The main difference between the inkblot activity and the modified Droodle task is that in the former, the student is given an image to interpret and in the latter, the student must construct a representation of her interpretation to share with others.

• This is another great group activity as it can inspire a number of diverse interpretations and it can be used to explore the reasons behind others’ drawings:
  – Do you think that other peoples’ drawings had anything to do with their interests or what they like or dislike?
  – How is the imagination or creativity of others the same as or different than your own?
  – Are there some pictures that everyone agreed on? Which ones? Why might that be?
Activity 3: Instructions for Clinicians

• Print the Droodles for the student(s). Tell them “This is just a small part of a much bigger picture. Look at the small part and see if you can imagine what the bigger picture is. There are no right or wrong answers. When you have an idea about what this could be, draw the rest of the picture.”

• When the students are done drawing, ask them to take turns explaining what they drew. Ask probing questions such as “What made you see that as the edge of a swimming pool?” or “Why do you think everyone came up with such different ideas about what this could be?”

• At the end, present the student(s) with the full view of the original image. When the student(s) see the full image, they should all agree on what it is. Isn’t that funny? Why does a part of a picture lead to such different interpretations but seeing the whole picture does not?
Draw the rest of the picture
Here is what you were working with!
Draw the rest of the picture
Here is what you were working with!
Draw the rest of the picture
Here is what you were working with!
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Here is what you were working with!
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Draw the rest of the picture
Here is what you were working with!
Activity 4: Understanding lexical ambiguity

• The understanding of ambiguous figures is associated with the understanding of homonyms (Rock et al., 1994):
  – Homonym: a word pronounced the same as another but differing in meaning, whether spelled the same way or not, as heir and air.
  – When the words are spelled the same, they are homonyms as well as homographs (e.g., a “bat” can refer to an animal or a baseball bat).

• Homonyms are members of a wider class of lexically ambiguous words and sentences. Activities 1-3 were designed to teach an understanding of an interpretive theory of mind by requiring one to impose different interpretations on the same visual stimulus. Activity 4 aims to extend this principle to language to support the understanding of lexical ambiguity in words and sentences which, in turn, is required for the appreciation of humor in puns (a.k.a. ‘play on words’).
Remember this?

- This picture can be seen in two different ways. It can be a rabbit or a duck.
- Sometimes, words are like pictures and they can be seen in different ways.
- For example, think about the word ‘bat’. It can have at least 2 meanings. Can you come up with two different meanings for the word “bat”? 
A ‘bat’ is a kind of animal

It is also something we hit a baseball with

When two words sound the same but have different meanings, we call them **homonyms**.
Talk it out...

Think about the words below. Each one can have at least two meanings. Talk with your teacher or other students about each word and see if you can come up with two meanings for each word. If you get stuck, look the word up in a dictionary.

<table>
<thead>
<tr>
<th>Fair</th>
<th>Saw</th>
<th>Right</th>
<th>Court</th>
<th>Row</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave</td>
<td>Leaves</td>
<td>Rock</td>
<td>Bar</td>
<td>Punch</td>
</tr>
<tr>
<td>Type</td>
<td>Beam</td>
<td>Bark</td>
<td>Park</td>
<td>Ring</td>
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<tr>
<td>Kind</td>
<td>Cool</td>
<td>Bolt</td>
<td>Trip</td>
<td>Fan</td>
</tr>
<tr>
<td>Star</td>
<td>Spring</td>
<td>Change</td>
<td>Break</td>
<td>Ball</td>
</tr>
<tr>
<td>Mean</td>
<td>Tie</td>
<td>Fall</td>
<td>Trunk</td>
<td>Watch</td>
</tr>
<tr>
<td>Sap</td>
<td>Well</td>
<td>Fire</td>
<td>Palm</td>
<td>Rose</td>
</tr>
<tr>
<td>Rope</td>
<td>Can</td>
<td>Match</td>
<td>Kid</td>
<td>Bank</td>
</tr>
</tbody>
</table>
Sometimes jokes are funny because there are two ways to think about a joke. Talk with your teacher or other students about these jokes. See if you can figure out the two meanings for each one.

What did one plate say to the other? Lunch is on me!
I couldn’t figure out how to fasten my seatbelt. Then it clicked!
My friend’s bakery burned down last night. Now his business is toast!
I used to have a fear of hurdles but I got over it.
I wondered why the baseball kept getting bigger. Then it hit me.
My time machine and I go way back.
Why are teddy bears never hungry? They’re always stuffed.
My best friend asked me to stop impersonating a flamingo. I had to put my foot down.
I used to be a baker, but I didn’t make enough dough.
Why can’t a bicycle stand up on its own? Because it’s two tired.
Did you hear about the guy whose whole left side got cut off? He’s all right now.
I woke up this morning and forgot which side the sun rises from. Then it dawned on me.
Did you know taller people sleep longer in bed?
I thought about becoming a witch, so I tried it for a spell.
Broken puppets for sale: No strings attached.
I applied for a job at a local restaurant. I’m still waiting.
The best way to communicate with a fish is to drop them a line.
The duck said to the bartender “Put it on my bill.”
• For more information about interpretive theory of mind, visit the Theory of Mind Atlas at theoryofmindinventory.com

• The ToM Atlas describes the nature and development of interpretive theory of mind and how it is affected in ASD, ADHD, and children with hearing loss.


Rubin, E. (1915). *Synsoplevede Figurer*.


