

Supporting Interpretive Theory of Mind through Ambiguous Figures



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Interpretive Theory of Mind

- Interpretive theory of mind is believed to be a precursor to social understanding and has been described as the commonsense understanding that the mind itself influences how the world is experienced (Carpendale & Lewis, 2006; Luckett et al., 2002).
- In assessing 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).

Ambiguous Figures

 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

- An interpretive theory of mind is believed to be a developmental precursor to humor appreciation and the understanding of deception.
- It also appears to be a transferrable skill that applies to other areas involving the understanding of alternative interpretations (e.g., understanding homonyms or false belief) (Lalonde & Chandler, 2002; Ropar et al., 2003; Wimmer & Doherty, 2011).
- The purpose of this activity is to introduce students to ambiguous figures and gauge their propensity to perform figure reversals using different levels of prompting.

Activity 1: Instructions

- Tell the student "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.
- If at any level of prompting, the student reports both interpretations (e.g., duck and rabbit), a check is performed by asking them to point out the features associated with each interpretation:
 - "It can be a duck. Show me how. Where is the beak?"
 - "It can be a rabbit. Show me how. Where are the ears?" Finally, confirm the student's interpretations by revealing the disambiguating images on the following page.

Activity 1: Prompting Levels

- PROMPTING LEVELS: "What do you see?" If the student reports only one interpretation, prompt:
 - 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 student still reports one interpretation, say "Let's look together. You said this looked like a [student's interpretation here] but it can also look like something else. What else can this be a picture of?"
 - 4. If the student 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 student 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 student understands object reversals.

Prompt Level Needed to Secure Reversal							
Figure	Level 1 (look 5 sec)	Level 2 (look 10 sec)	Level 3 (what else?)	Level 4 (see both?)	Level 5 (reveal)	NOTES	
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Prompt Level Needed to Secure Reversal

Figure	Level 1 (look 5 sec)	Level 2 (look 10 sec)	Level 3 (what else?)	Level 4 (see both?)	Level 5 (reveal)	NOTES
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$\left(\begin{array}{c} \\ \end{array}\right)$						



Jastrow (1900)







Jastrow (1990); Sobel, Capps, & Gopnik, (2005)



Wimmer & Doherty (2009)







Wimmer & Doherty (2009)











































Rubin (1915)







Rubin (1915)



Shaquiri, Anderson, & Danckert (2013)







Shaquiri, Anderson, & Danckert (2013)



Thomson (2009)







Thomson (2009)



Roper, Mitchell, & Ackroyd (2003)







Roper, Mitchell, & Ackroy (2003)



Necker (1832)







Necker (1832)



(Williams, 1998)







(Williams, 1998)

Activity 2:

Understanding Interpretive Diversity through Inkblots

- Understanding that there can be more than two interpretations of an ambiguous image highlights <u>interpretive diversity</u>. This is important for <u>all</u> children to understand because it highlights the unique contribution that different perspectives can bring to thinking and problem-solving.
- For this activity, print the following materials and ask students to "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 an ideal group activity as it can inspire a number of diverse interpretations (note: the stimuli are ordered so that you are likely to see more diverse interpretations as you go along). Use this activity to supportively explore the reasons behind students' unique or imaginative interpretations.

Support Level Needed to Secure an Interpretation							
Figure	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (unable to perform)	NOTES	
57							
Support Level Needed to Secure an Interpretation							
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Figure	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (unable to perform)	NOTES	
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Make Inkblots!



"My crazy mustache man clown"

- It's fun and easy! Just smack some ink on half of a piece of paper, fold it in half, open it up, and let it dry.
- Get creative:
 - Have students 'show and tell' their interpretation.
 - Have students take turns interpreting everyone's inkblots.
 - Have each student decide on their own interpretation (the weirder the better) and ask them to draw in the details that make their interpretation more obvious to others.
 - Send inkblots home and ask students to explain the activity (and their and/or others' interpretations) with a parent.

Activity 3:

Understanding interpretive diversity through Droodles

- Like Inkblots, Droodles (Lalonde & Chandler, 2002) can inspire an unlimited number of interpretations.
- The main difference between inkblots and Droodles is that for inkblots, students interpret an already formed image whereas for Droodles, students are given a partial image and asked to build on their unique interpretations.
- 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' drawing and thinking.

Activity 3: Instructions for Clinicians

- Print the Droodles and introduce the activity: For example,
 - "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, ask them to share what they came up with while supportively exploring the creativity in their diverse views. You might ask questions like "What made you see that as the edge of a swimming pool?" or "Why do you think everyone came up with such different (or similar) ideas about what this could be?"
- At the end, present student with the full, original image. At this point, they should all agree on what the *original artist's interpretation* or intent was. But isn't that interesting!? Explore:
 - Sometimes people agree on what they see. Sometimes they don't. Why do you think people often see things differently?

It's all about perspective...



https://x.com/CoachDmarsh/status/1162073059345522689

Support Level Needed to Secure an Interpretation							
Figure	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (unable to perform)	NOTES	
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Support Level Needed to Understand/Discuss Others' Interpretations

Figure	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (unable to perform)	NOTES
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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 been 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**.





Think about the words on the next page. Each one can have at least two meanings. Can you see two meanings for each word? If you can, come up with a sentence for *each* meaning. Your sentences should make the meaning of the word clear. Here is an example for the word 'BAT':

I saw a bat flying around my house.
I hit the ball with the baseball bat.



Come up with the sentences...



Fair	Saw	Right	Court	Row
Wave	Leaves	Rock	Bar	Punch
Туре	Beam	Bark	Park	Ring
Kind	Cool	Bolt	Trip	Fan
Star	Spring	Change	Break	Ball
Mean	Tie	Fall	Trunk	Watch
Sap	Well	Fire	Palm	Rose
Rope	Can	Match	Kid	Bank

Level 1 (none)	No prompting required following introduction to activity. The child is readily able to report two meanings of a word and to construct sentences for each meaning.
Level 2 (minimum)	Prompting involves giving 1 -2 'hints' or 'reminders' regarding the concept of lexical ambiguity (e.g., "remember, each word can be seen in at least two ways")
Level 3 (moderate)	Prompting involves several 'hints' or 'reminders' regarding the concept of lexical ambiguity <i>or</i> 1-2 hints involving the content of one or both potential word meanings (e.g., "You're right, 'fair' can mean you are playing fair. It can also be something that you go to where there are rides and cotton candy!")
Level 4 (significant)	Prompting involves several 'hints' or 'reminders' regarding the concept of lexical ambiguity <i>or</i> more than 2 hints involving the content of one or both potential word meanings. With significant prompting, there are several hints and reminders but the child is eventually able to construct two sentences: one for each meaning of the word.
Level 5: could not perform (reveal)	Even with repeated hints, prompting, and reminders, the child is unable to report two meanings of a word or to construct sentences for each meaning.

Word	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (reveal)	NOTES:
Fair						
Wave						
Туре						
Kind						
Star						
Mean						
Sap						
Rope						
Saw						
Leaves						
Beam						
Cool						
Spring						
Tie						

Word	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (reveal)	NOTES:
Well						
Can						
Right						
Rock						
Bark						
Bolt						
Change						
Fall						
Fire						
Match						
Court						
Bar						
Park						
Trip						

Word	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (reveal)	NOTES:
Break						
Trunk						
Palm						
Kid						
Row						
Punch						
Ring						
Fan						
Ball						
Watch						
Rose						
Bank						

Jokes are sometimes funny because there are two ways to think about them. Talk about each of these jokes. See if you can figure out the two meanings for each one!

- 1. What did one plate say to the other? Lunch is on me!
- 2. I couldn't figure out how to fasten my seatbelt. Then it clicked!
- 3. My friend's bakery burned down last night. Now his business is toast!
- 4. I used to have a fear of hurdles but I got over it.
- 5. I wondered why the baseball kept getting bigger. Then it hit me.
- 6. My time machine and I go way back.
- 7. Why are teddy bears never hungry? They're always stuffed.
- 8. My best friend asked me to stop impersonating a flamingo. I had to put my foot down.
- 9. I used to be a baker, but I didn't make enough dough.
- 10. Why can't a bicycle stand up on its own? Because it's two tired.
- 11. Did you hear about the guy whose whole left side got cut off? He's all right now.
- 12. I woke up this morning and forgot which side the sun rises from. Then it dawned on me.
- 13. Did you know taller people sleep longer in bed?
- 14. I applied for a job at a local restaurant. I'm still waiting.
- 15. The duck said to the bartender "Put it on my bill."



Support Level Needed to 'Get the Joke'

Level 1 (none)	No prompting required following introduction to activity. The child is readily able to 'see the joke' and to explain why it is 'funny'.
Level 2 (minimum)	Prompting involves giving 1 -2 'hints' or 'reminders' regarding the concept of lexical ambiguity (e.g., "Remember, there is a word in this sentence that can be seen in at least two ways. This is why the joke is funny. Can you find it?)
Level 3 (moderate)	Prompting involves pointing out the lexically ambiguous word (e.g., "A baker can make <i>dough</i> to make bread but <i>dough</i> can also mean something else. Do you know another meaning for 'dough'?")
Level 4 (significant)	Prompting involves pointing out the meaning of the lexically ambiguous word (e.g., "Dough is another word for money. Now can you explain why the joke is 'funny'?")
Level 5: could not perform (reveal)	Even with instruction that makes the meaning of the ambiguous word(s) explicit, the child is unable to see the two interpretations of the sentence and does not appear to 'get the joke.'

Support Level Needed to "Get the Joke"

Joke	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (reveal)	NOTES:
1						
2						
3						
4						
5						
6						
7						
8						

Support Level Needed to "Get the Joke"

Joke	Level 1 (none)	Level 2 (min.)	Level 3 (mod.)	Level 4 (sig.)	Level 5 (reveal)	NOTES:
9						
10						
11						
12						
13						
14						
15						

Learn more?

 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.

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