

# Establishing and Using Common Ground in Dialogue

BCS 152

November 12 2018

# Common Ground is important for understanding

A: okay, okay, I got it...ele...okay

B: all right, hold on, I got another easy piece

A: I got a well wait I got a green piece RIGHT above that

B: Above this piece?

A: Well not exactly right above it

B: It can't be above it

A: It's to the...it's...it doesn't wanna fit in the cardboard

B: It's to the right, right?

A: Yep

B: Wh-how? Where?

A: It's...kinda line up with the two holes

B: Line 'em up right next to each other?

A: Yeah, vertically

## What's going on?

- What does it mean for something to be in common ground?

# If I want to flout a Gricean Maxim...

- I have to know the maxims
- I have to know that you know the maxims
- I have to know that you know that I know the maxims
- I have to know that you know that I know that you know the maxims
- ...

# If I want to use the word ‘horse’ effectively...

- I have to know what a horse is
- I have to know that you know what a horse is
- I have to know that you know that I know what a horse is
- I have to know that you know that I know that you know what a horse is
- ...

# What's in common ground?

- Sometimes assumed (e.g., world knowledge)
- Sometimes context-dependent
  - Prior discourse
  - Shared sensory environment

# World knowledge example: hyperbole

A: This bag of candy cost me \$1,500.

*implies*

The bag of candy was expensive *for a bag of candy*

It probably didn't cost \$1,500

# World knowledge example: hyperbole

A: This laptop cost me \$1,500.

Don't really get a hyperbolic implicature here (\$1,500 is normal for a laptop)

# If something's not in common ground, how do we get it there?

Negotiation and backchanneling in dialogue

A: So I was cat-sitting my friend's Scottish Fold.

B: [looks confused]

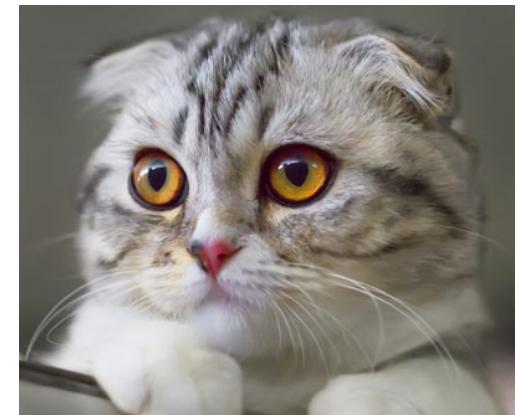
A: Scottish Folds are this cat with funky looking ears

B: What do they look like?

A: They're like folded over [mimes]

B: [nods] oh yeah, those cats

A: [continues story] ..



# How do we study use of common ground in dialogue?

- Study naturalistic dialogue in a constrained context
- Referential games



Herb Clark



Mike Tanenhaus

# Establishing common ground: Conceptual Pacts

# Tangram Matching Game



(A)



(B)



(C)



(D)



(E)



(F)



(G)



(H)



(I)



(J)



(K)



(L)

1: All right, the next one looks like a person who's ice-skating, except they're sticking their two arms out front.

2: The person ice skating that has two arms

3: The person ice skating, with two arms

4: The ice skater

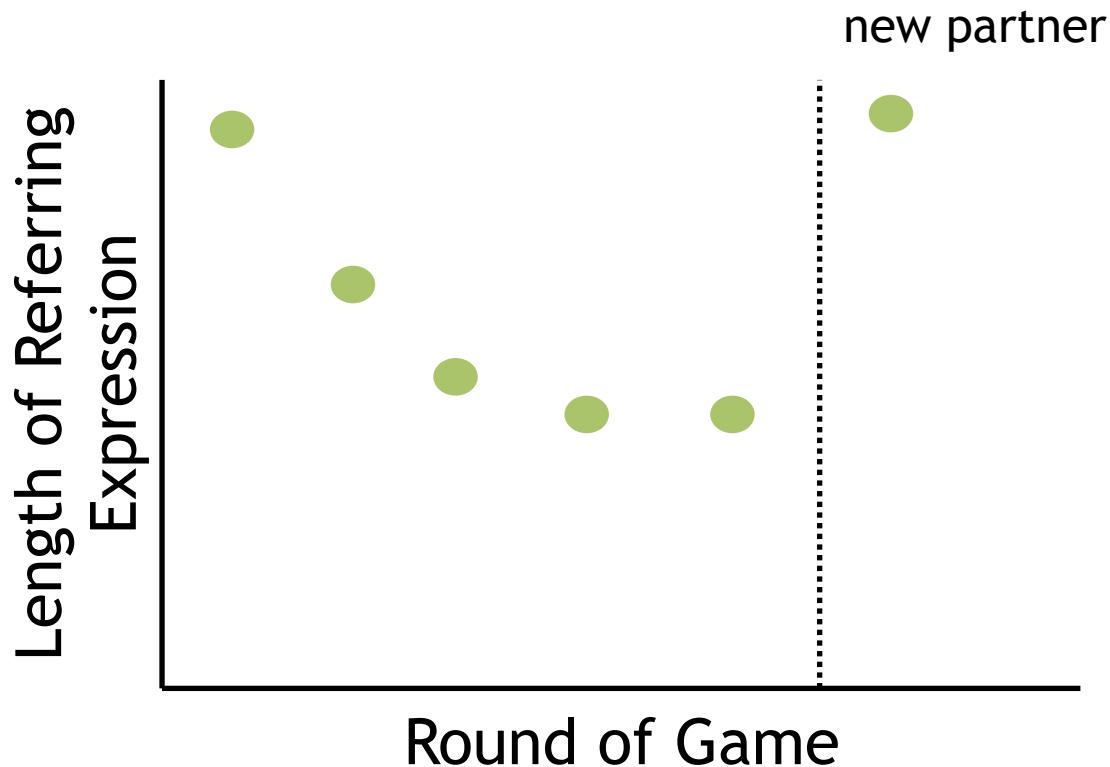
5: The ice skater

6: The ice skater



{ II }

Clark & Wilkes-Gibbs (1998)



# Conceptual Pact

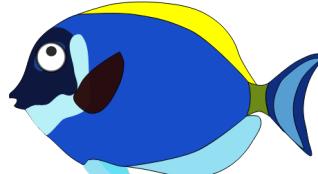
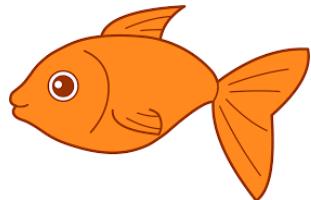
- Interlocuters have developed a *conceptual pact* to call  the ‘ice skater’
- Reference to a weird object is now predictable and easy! (it’s in common ground)
- Have to establish a new conceptual pact with a new conversational partner
- How strong are conceptual pacts?

# Brennan & Clark (1996)

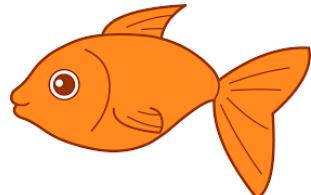
Play a matching game where speaker has to describe the card they have to the listener

Phase 1: different kinds of objects from the same category

Phase 2: all different categories



Phase 1 Cards



Phase 2 Cards

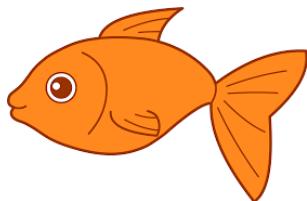
# Phase 1 Results



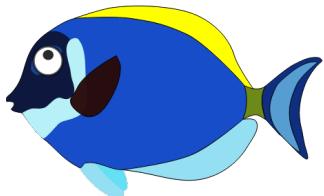
‘high heel’



‘sneaker’



‘orange fish’

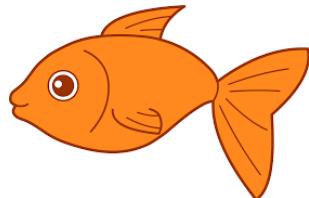


‘blue fish’

# Phase 2 Results



‘high heel’



‘orange fish’



‘tool’



‘chair’

- Conceptual pacts last even if they're no longer needed to make informative distinctions between objects

# Ibarra & Tanenhaus (2016)

- How strong are conceptual pacts? Do we break them under some circumstances?
- Tested 2 situations:
  - The goal of the game changes
  - New items appear that are confusable with a previous conceptual pact word

# Experiment 1: Goal Change

- Speaker has a stack of cards, listener has a pile of objects
- Speaker & listener separated by a divider
- Speaker tells the listener what to do with the objects

# Experiment 1: Goal Change

- Item Phase: Sort a bunch of objects into different piles

Example Card



# Experiment 1: Goal Change

- Build Phase: build creatures out of the objects



Example Card



- Does the name for the same object stay the same between phases (maintain conceptual pact) or change (break conceptual pact)?

# Results

## References to lion leg across phases

### Item Phase

A: Alright, my turn. It's kinda, alright, the one I'm looking at kind of looks like a wrench. It's the same color. (turn 477)

B: Got it. There's two wrenches, though. (turn 478)

A: Um, this is the one {fate}, this is the one that if you put the circle at the bottom, the other hole is facing left. (turn 479)

B: Um, so it has a flat side. One has like a, (turn 480)

A: Yeah, one, so, yeah, it's flat towards the left. (turn 481)

B: Alright, got it. (turn 482)

B: So, this is the flat tow-, this is the same wrench but the one that is like, not, like a little bit disoriented. (turn 483)

A: Alrighty. (turn 484)

B: Alright. So just both wrenches. (turn 485)

### Build Phase

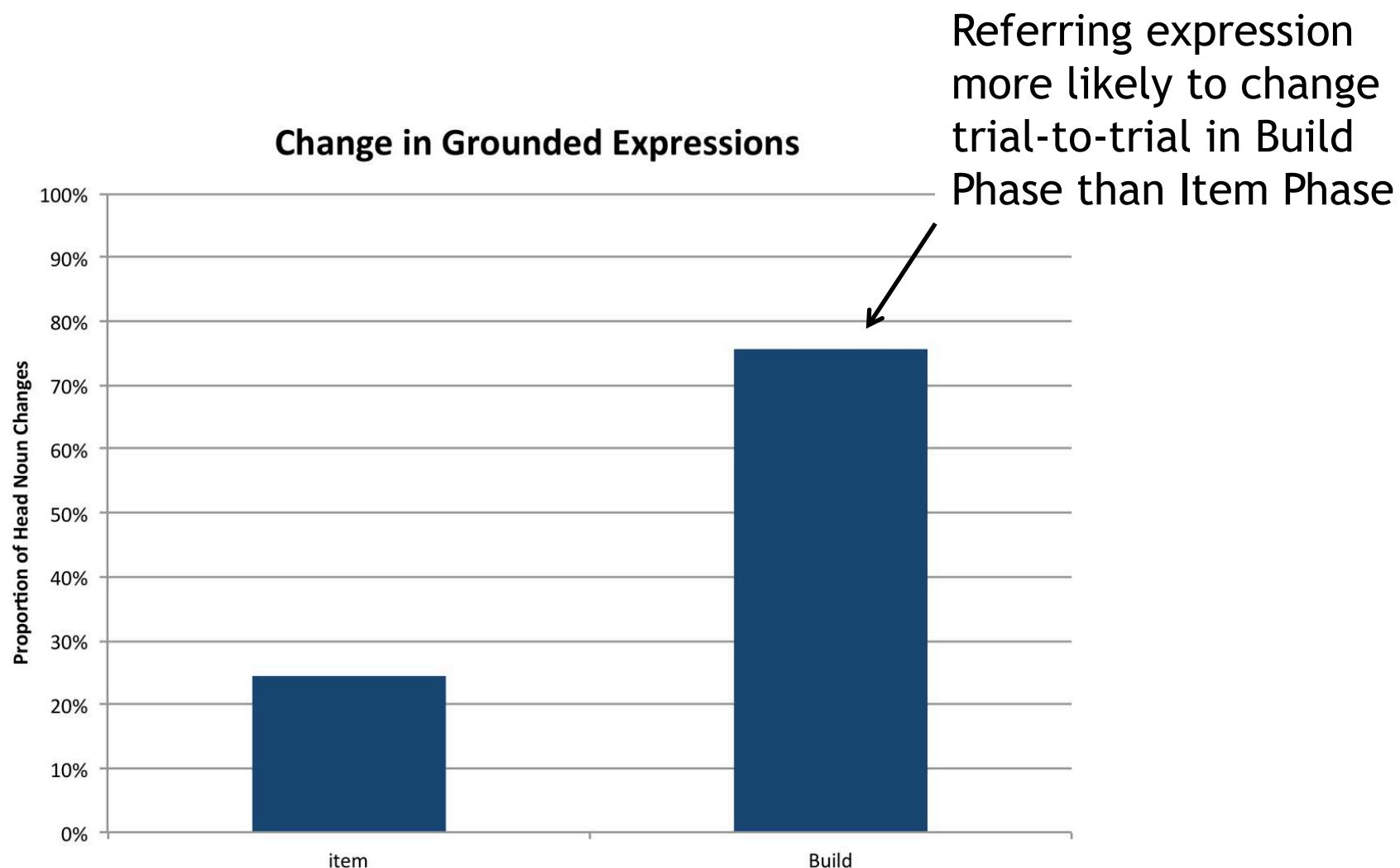
A: Alrighty. Um, the next piece is uh basically assembling the leg. So what you get is you get the long flat one, (turn 682)

B: Yeah. (turn 683)

A: Not the long flat one, the one with like straight edges. (turn 684)

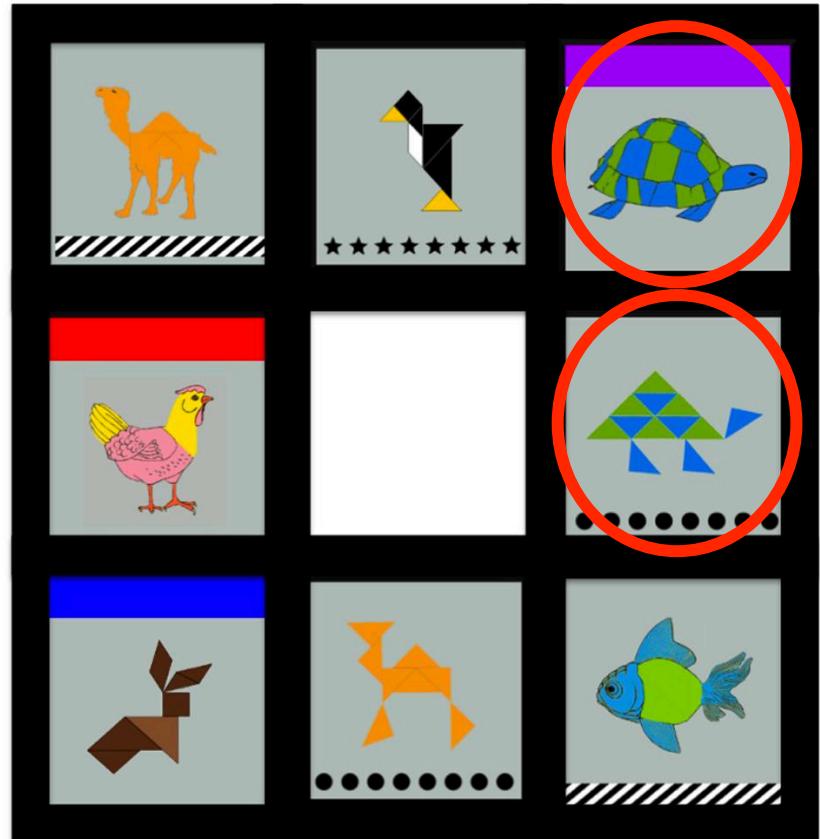
B: The wrench, yeah. (turn 685)

# Results



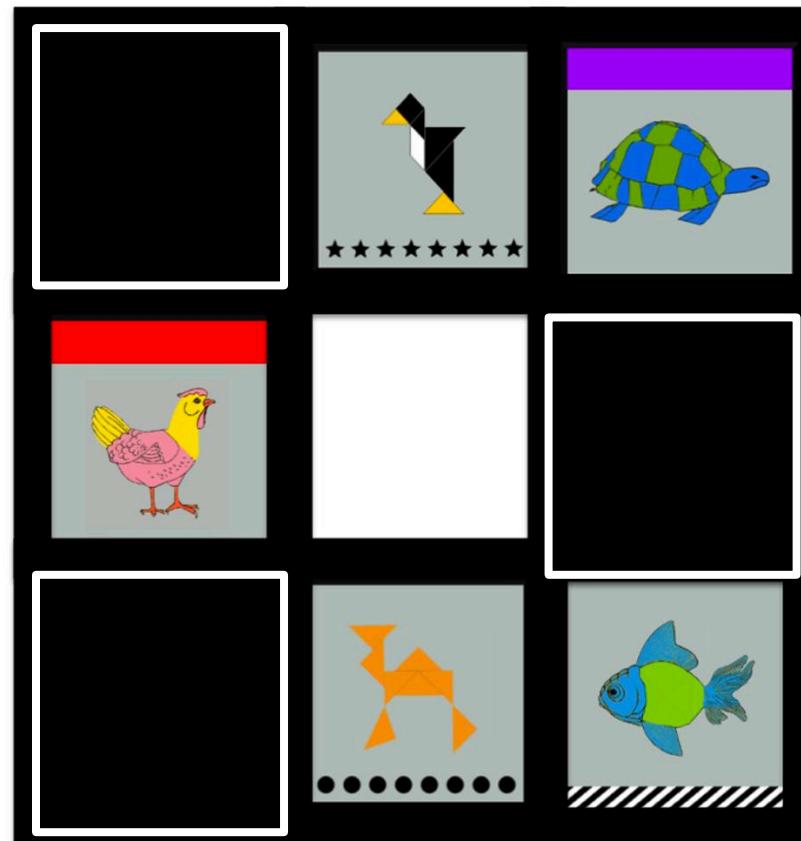
# Experiment 2: New Confusable Items

- Game: slide cards around until they're in the correct configuration
- Speaker knows the configuration and has to describe to listener

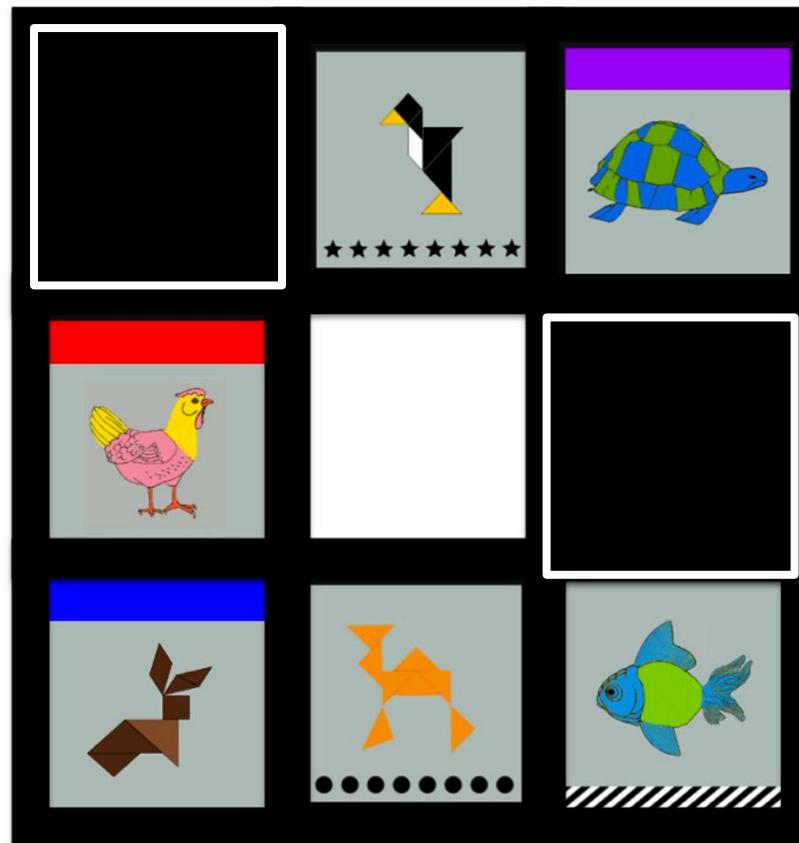


- The catch: some items are hidden at first and only appear later in the game

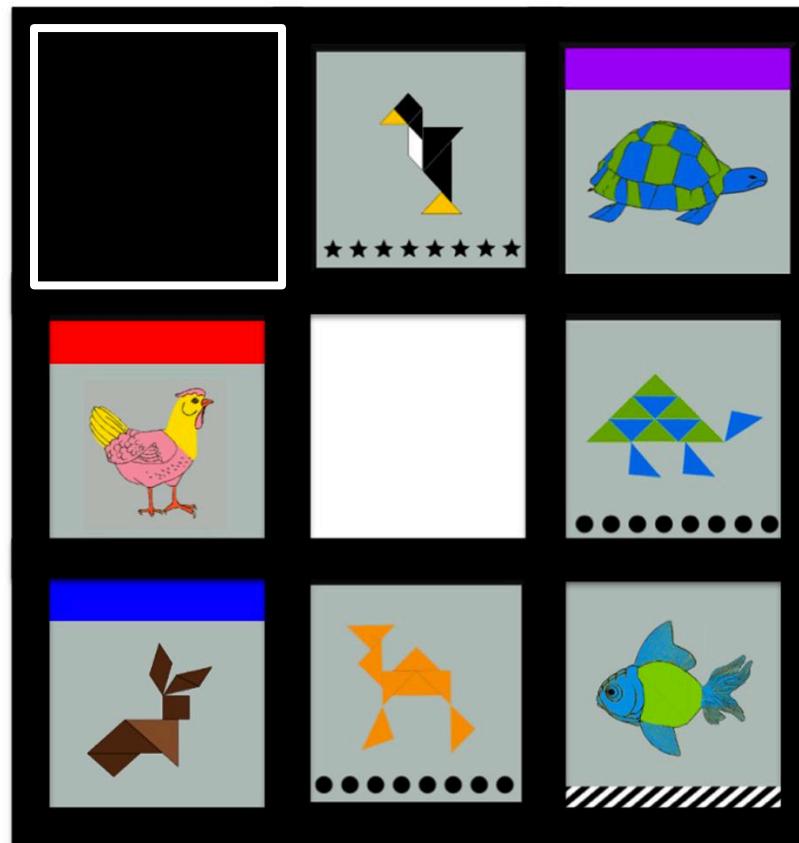
Round 1



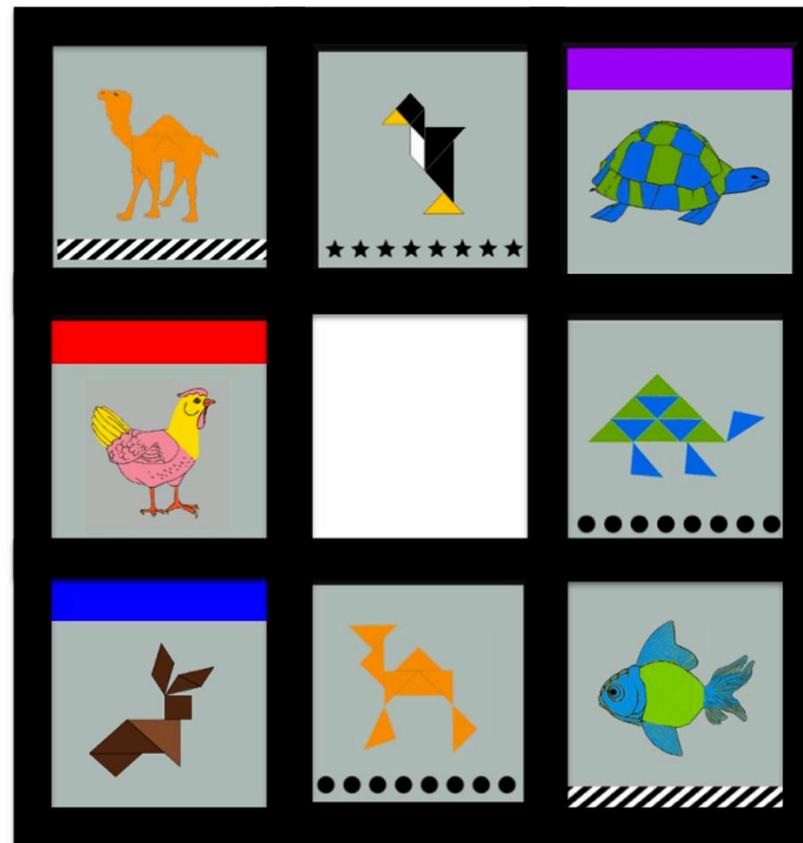
## Round 2



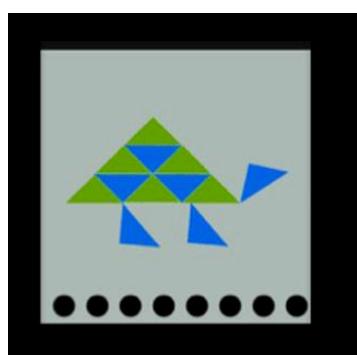
# Round 3



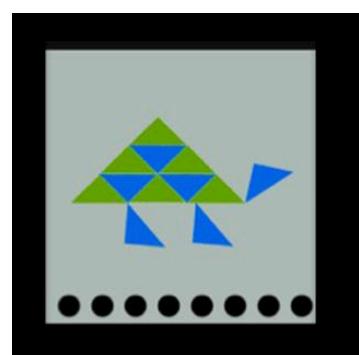
# Round 4



- What do people do when a new name competitor appears?
- Possibility 1: Keep the conceptual pact and come up with a different name for the new object

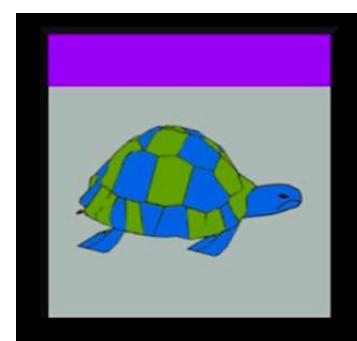


‘turtle’

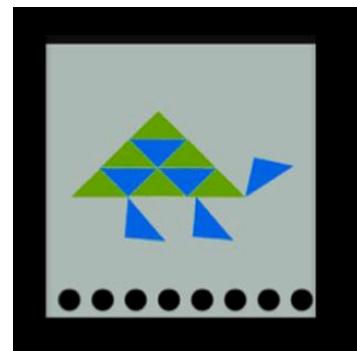


‘turtle’

...



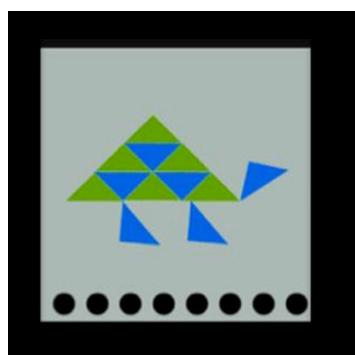
‘more real-looking turtle’



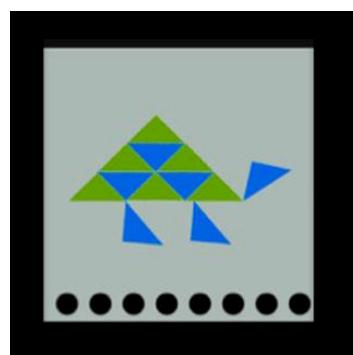
‘turtle’

Time in Game →

- What do people do when a new name competitor appears?
- Possibility 2: Break the conceptual pact and come up with new names for both

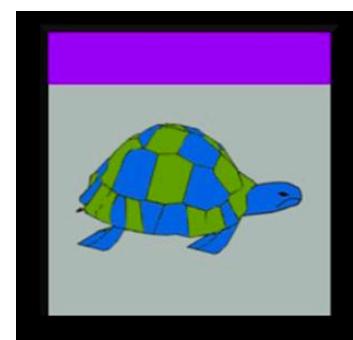


‘turtle’

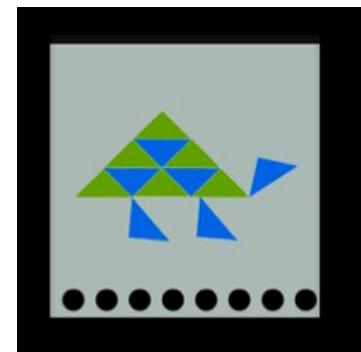


‘turtle’

...

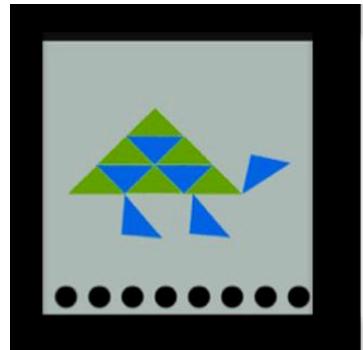


‘more real-looking turtle’

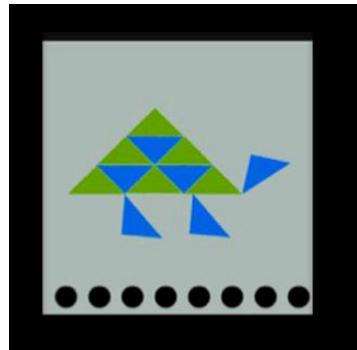


‘blocky turtle’

Time in Game →

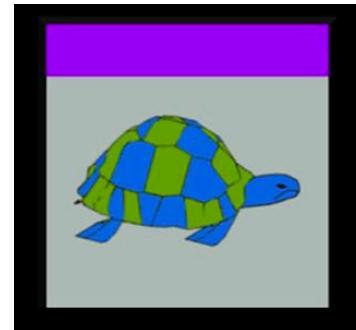


‘turtle’

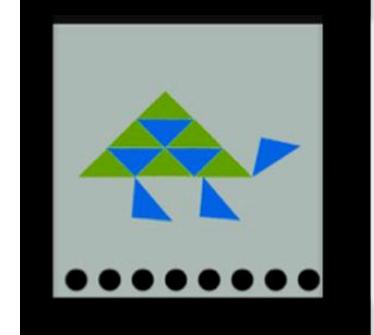


‘turtle’

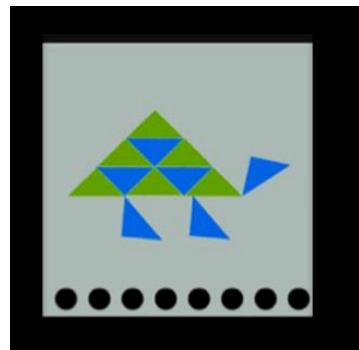
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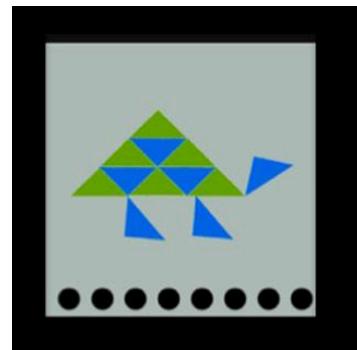
‘more real-looking turtle’



‘turtle’

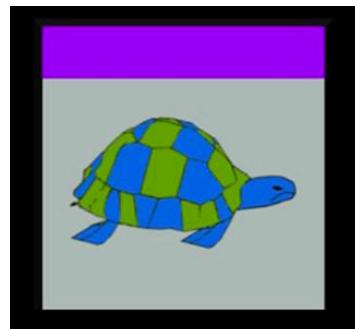


‘turtle’

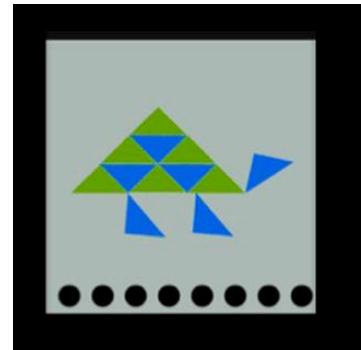


‘turtle’

• • •



‘more real-looking turtle’



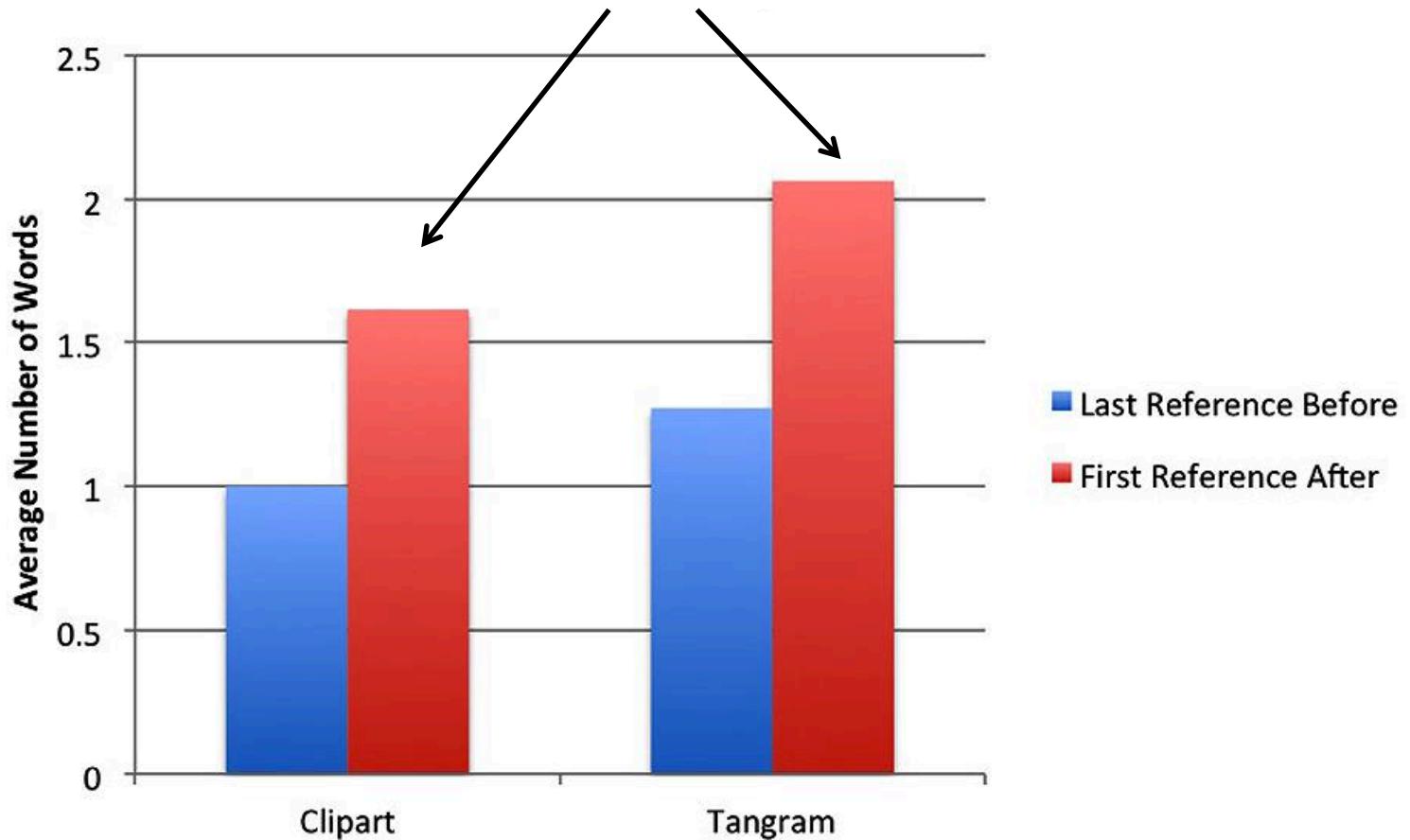
‘blocky turtle’

**Breaking pact:** more words to refer to blocky turtle after real turtle reveal than before

**Keeping pact:** same amount of words to refer to blocky turtle after real turtle reveal as before

# Results

people use more words when a competitor appears, ‘breaking’  
the conceptual pact

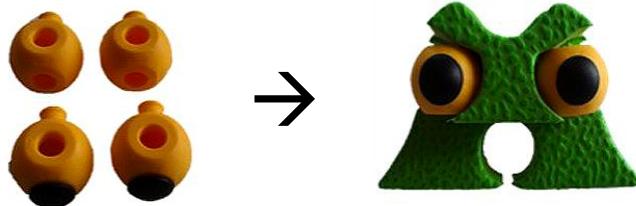


# Conceptual Pacts: Summary

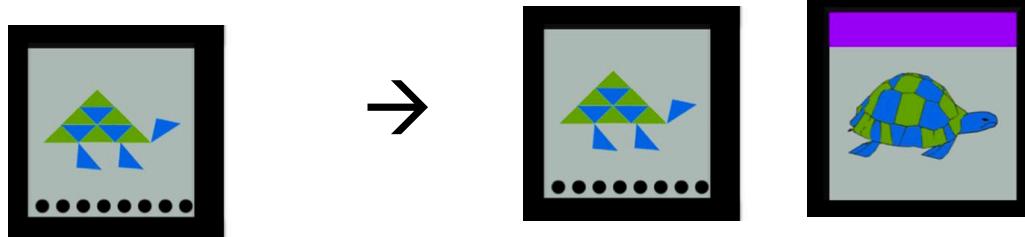
- Establishes common ground for how to refer to an object or concept difficult-to-describe abstract object  
→ ‘ice skater’  
(II)
- Strongly binding: use them even when simpler words are sufficient → 
- Partner-specific through negotiation and dialogue

# Conceptual Pacts: Summary

- But, conceptual pacts can be re-negotiated if needed
  - New goal



- New competing objects



# Using Common Ground in Comprehension

- So we've established common ground...
- How do we use it to make real-time inferences about meaning?
- 2 possibilities:
  - we take into account what we know first, and only consider common ground later or if we're wrong
  - we take into account common ground as early as possible

# Brown-Schmidt et al. (2008)

- Can listeners predict what information a speaker is asking about?
- Game: ‘Barnyard Oscars’



track where  
listener is  
looking

Listener



board filled with  
cards

Speaker





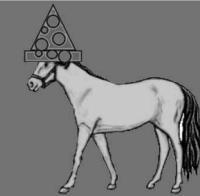
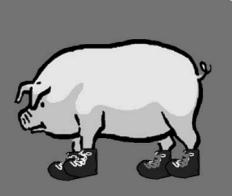
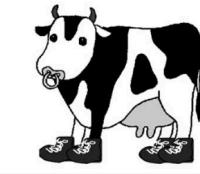
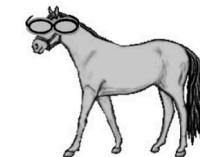
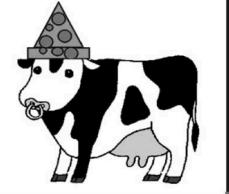
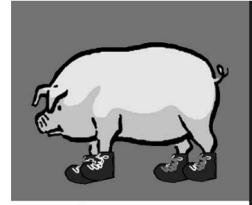
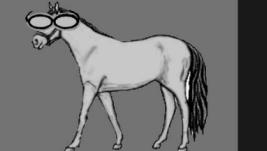
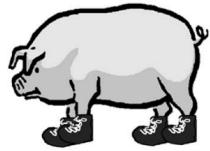
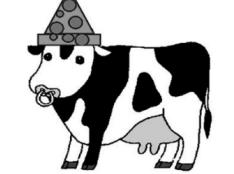
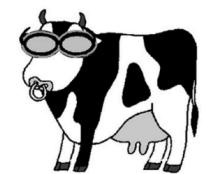
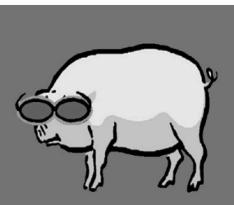
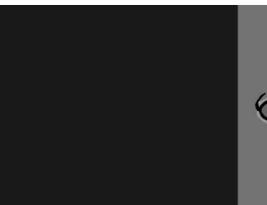
both have  
card



speaker doesn't  
have card



listener doesn't  
have card





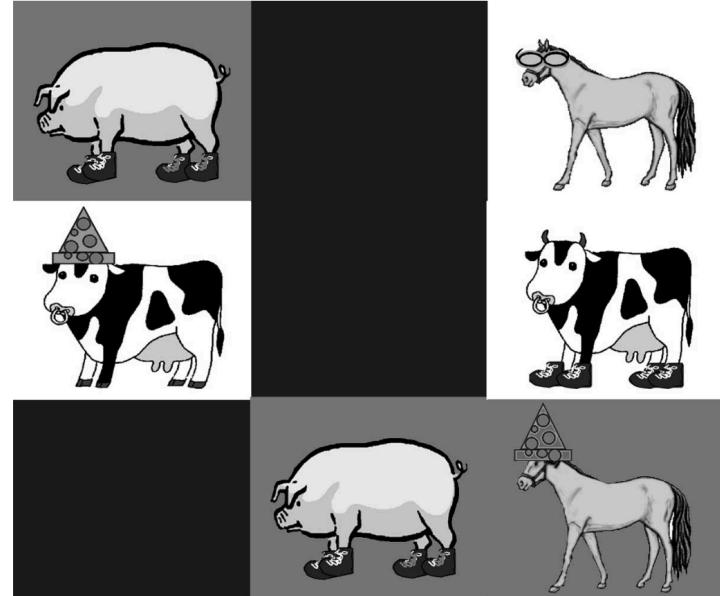
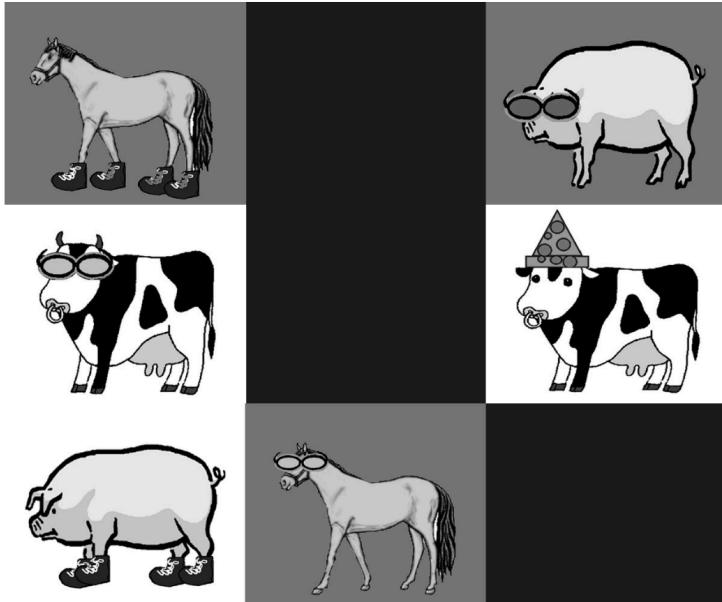
both have  
card



speaker doesn't  
have card



listener doesn't  
have card



Some items are in common ground

Others are in ‘privileged ground’ (only one person  
has access to them)



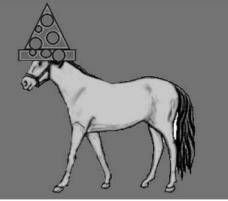
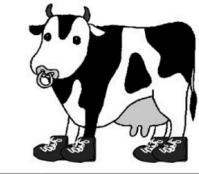
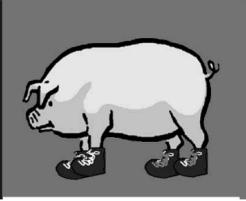
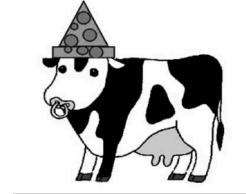
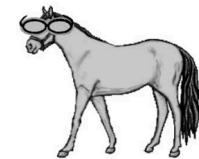
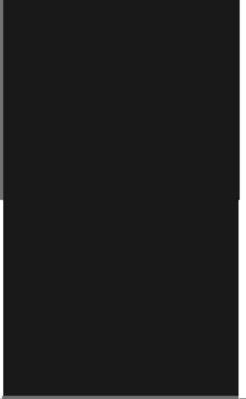
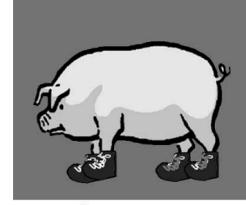
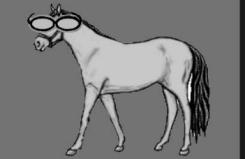
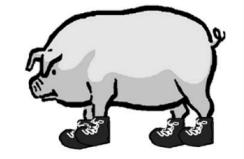
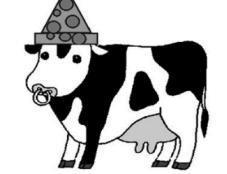
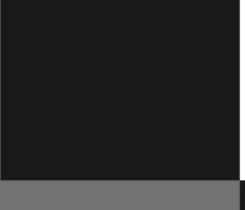
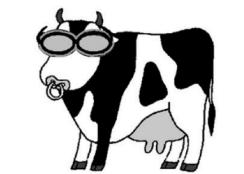
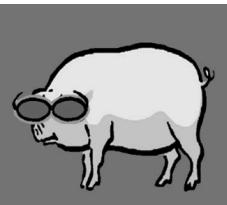
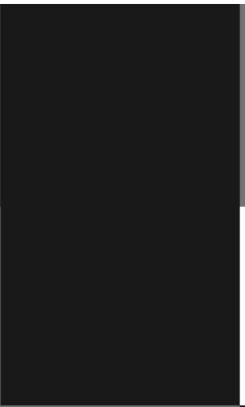
both have  
card



speaker doesn't  
have card



listener doesn't  
have card



**“What’s above the cow with....”**



both have  
card

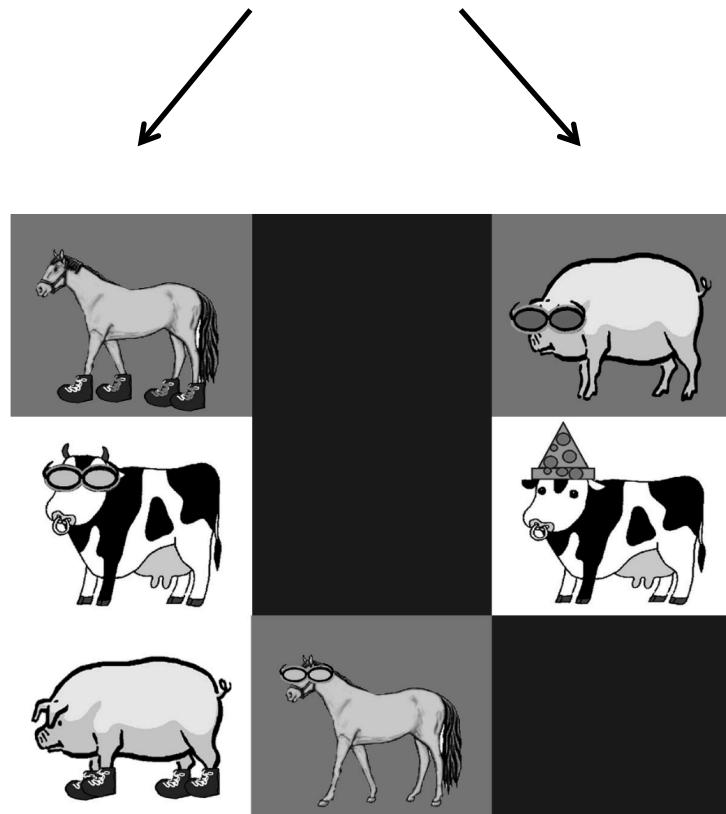


speaker doesn't  
have card

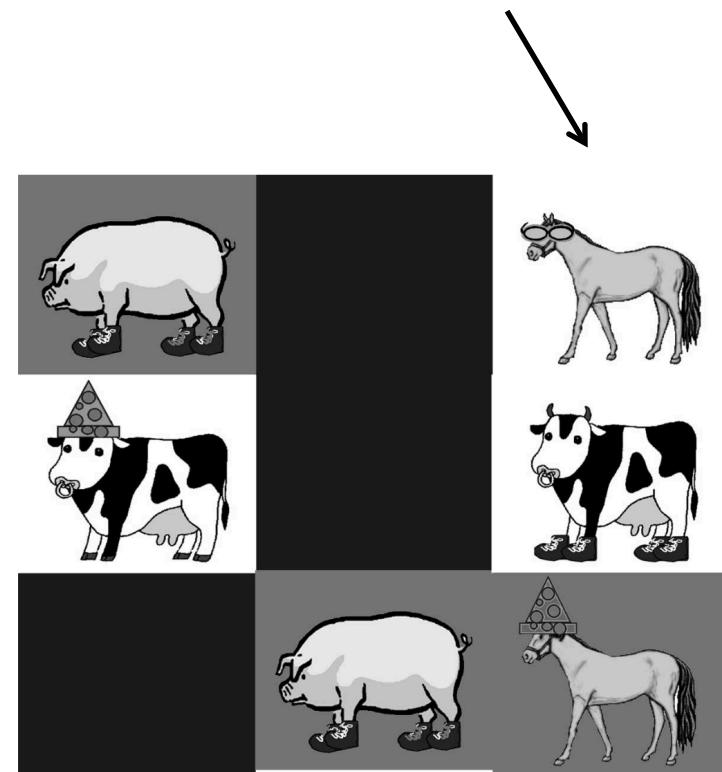


listener doesn't  
have card

two objects privileged



one object  
privileged



**“What’s above the cow with....”**



both have  
card

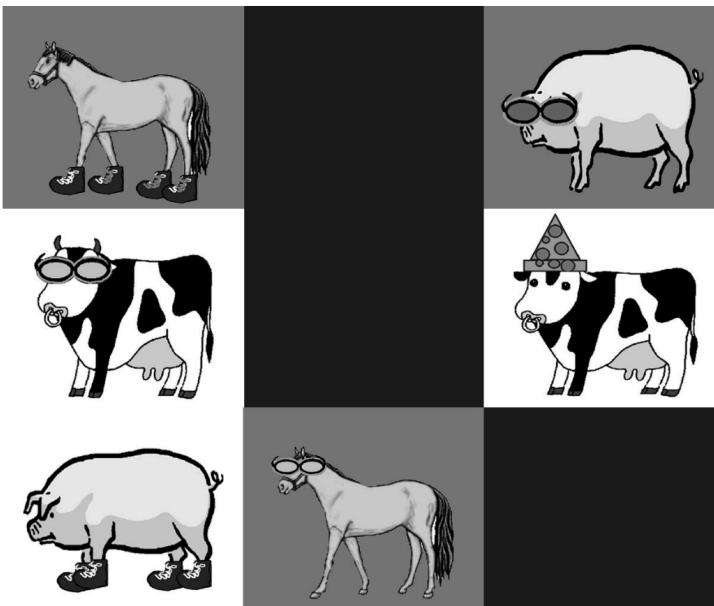


speaker doesn't  
have card

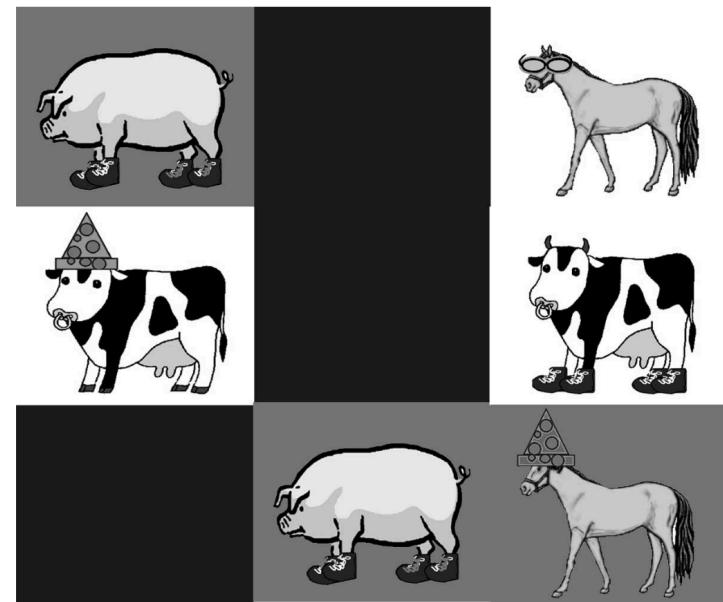


listener doesn't  
have card

could be asking about  
either of these



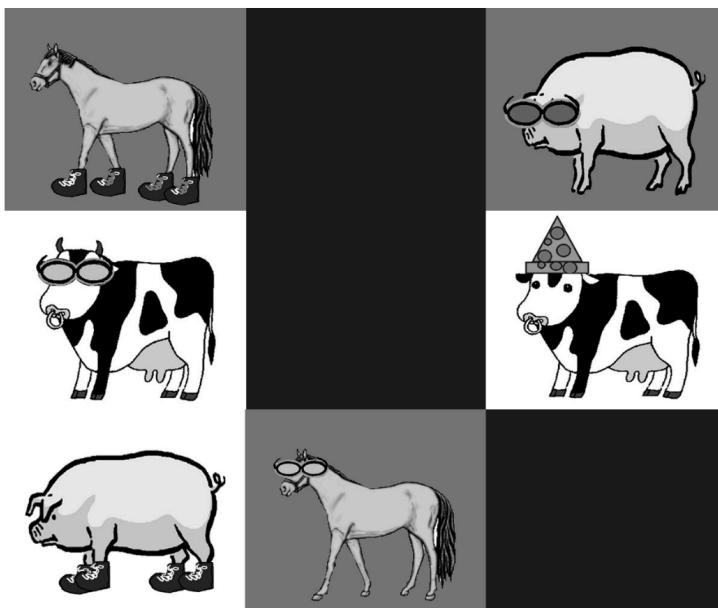
why would they ask  
about this?! they  
can already see it!



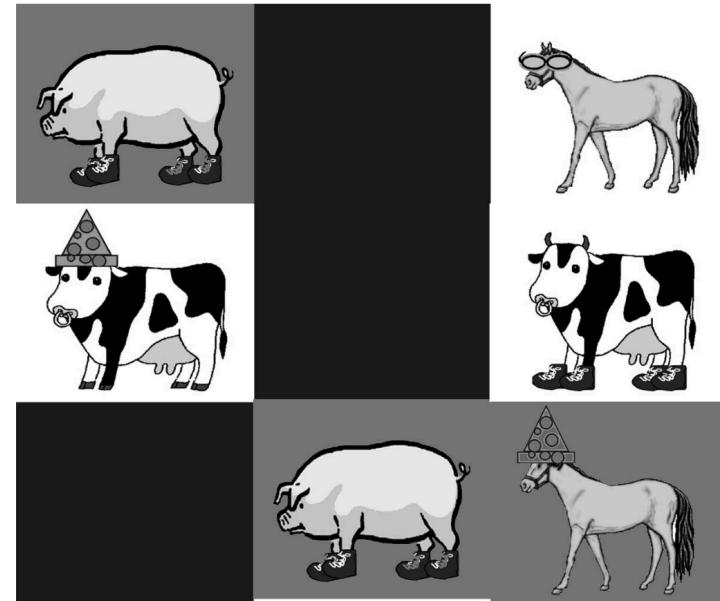
**“What’s above the cow with....”**

# If listeners DON'T take common ground into account right away...

look between these  
equally



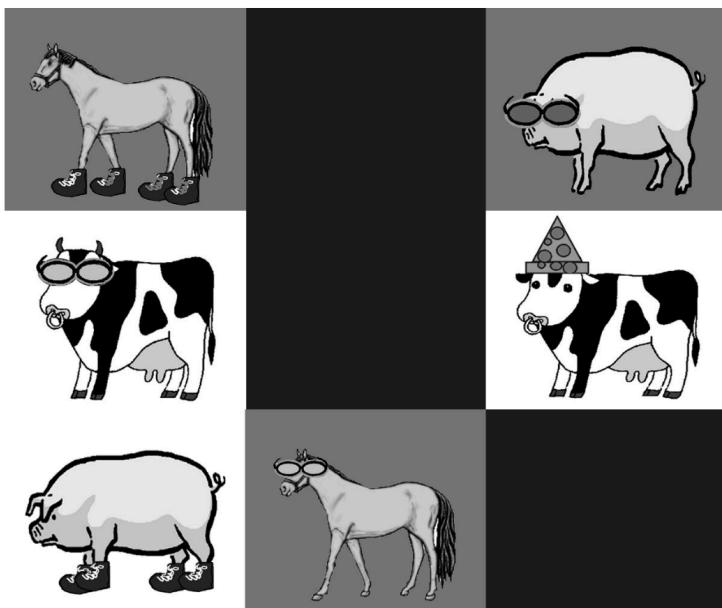
look between these  
equally



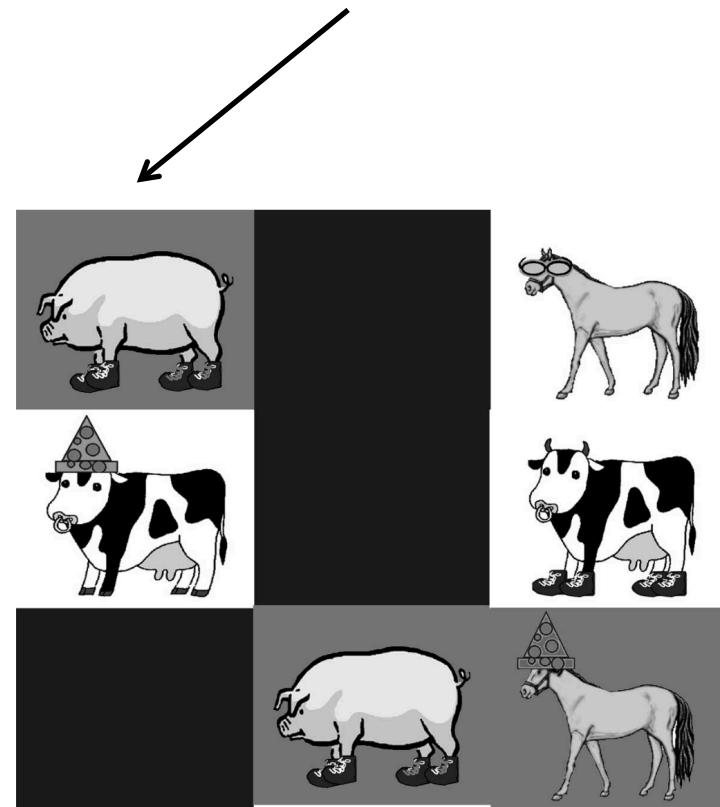
“What’s above the cow with....”

# If listeners DO take common ground into account right away...

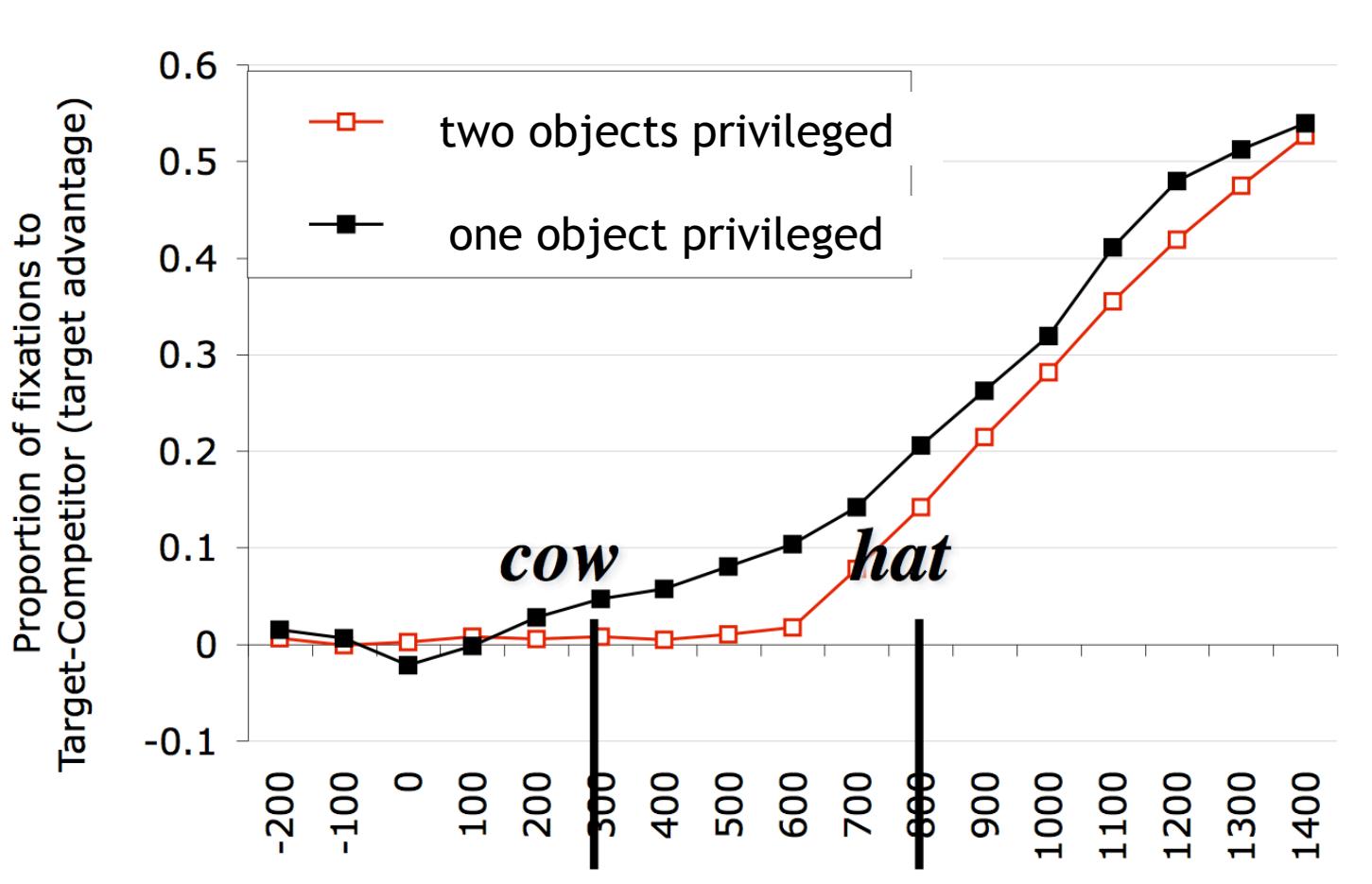
look between these  
equally



look only at this one



“What’s above the cow with....”



- Listeners can quickly figure out what the speaker is asking about by using common ground
- Occurs immediately, before disambiguating information

# Heller, Grodner, & Tanenhaus (2008)

- Are listeners able to quickly use common ground to infer referential meaning?

track where  
listener is  
looking

Listener

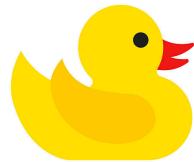
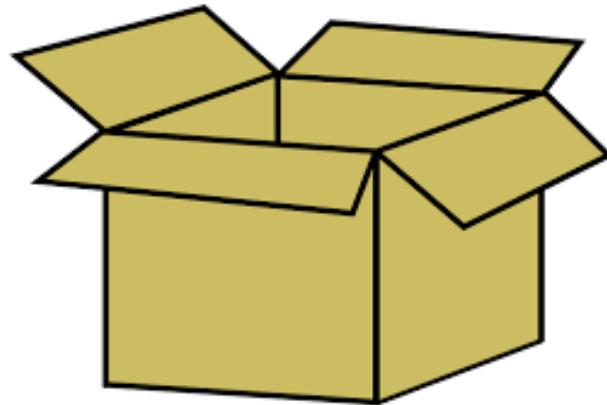
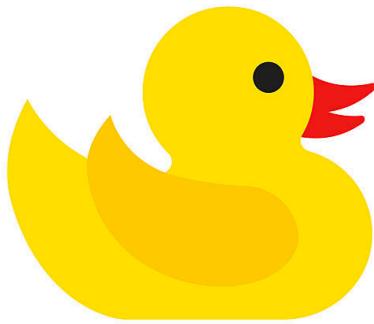


cubbyholes filled  
with objects

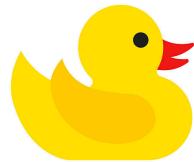
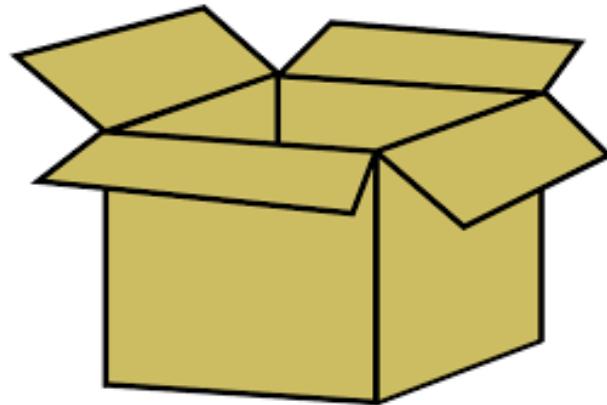
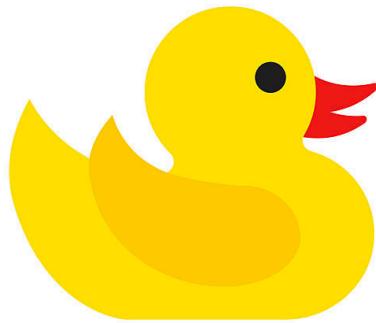
Speaker



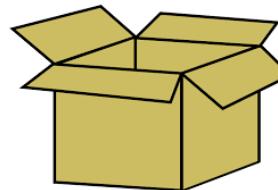
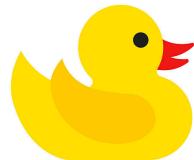
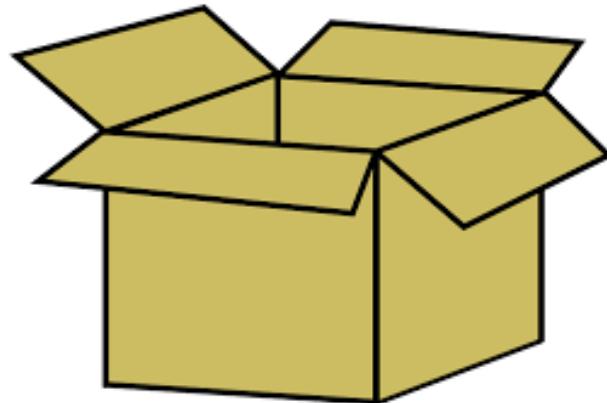
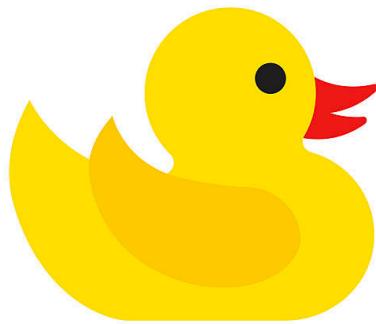
Speaker is cued to refer to one of the objects



‘Click on the big...’

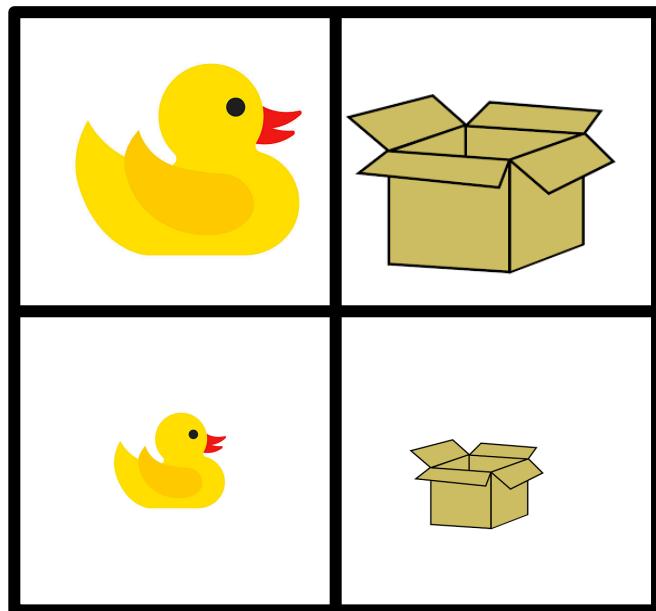


‘Click on the big...’

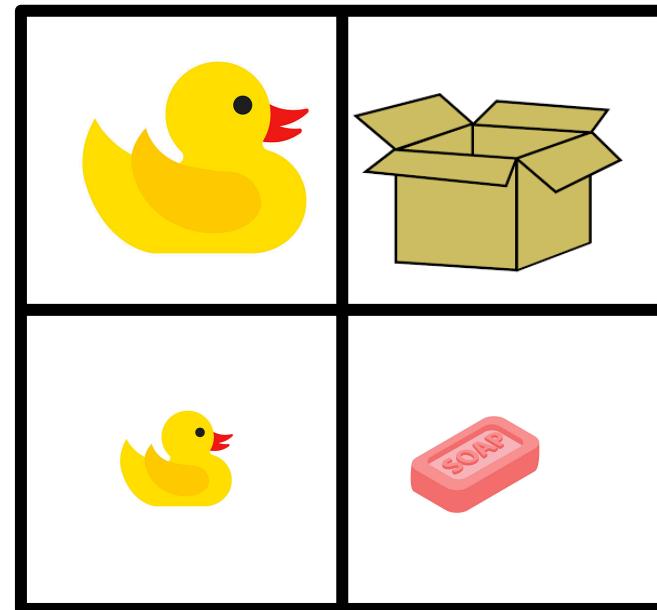


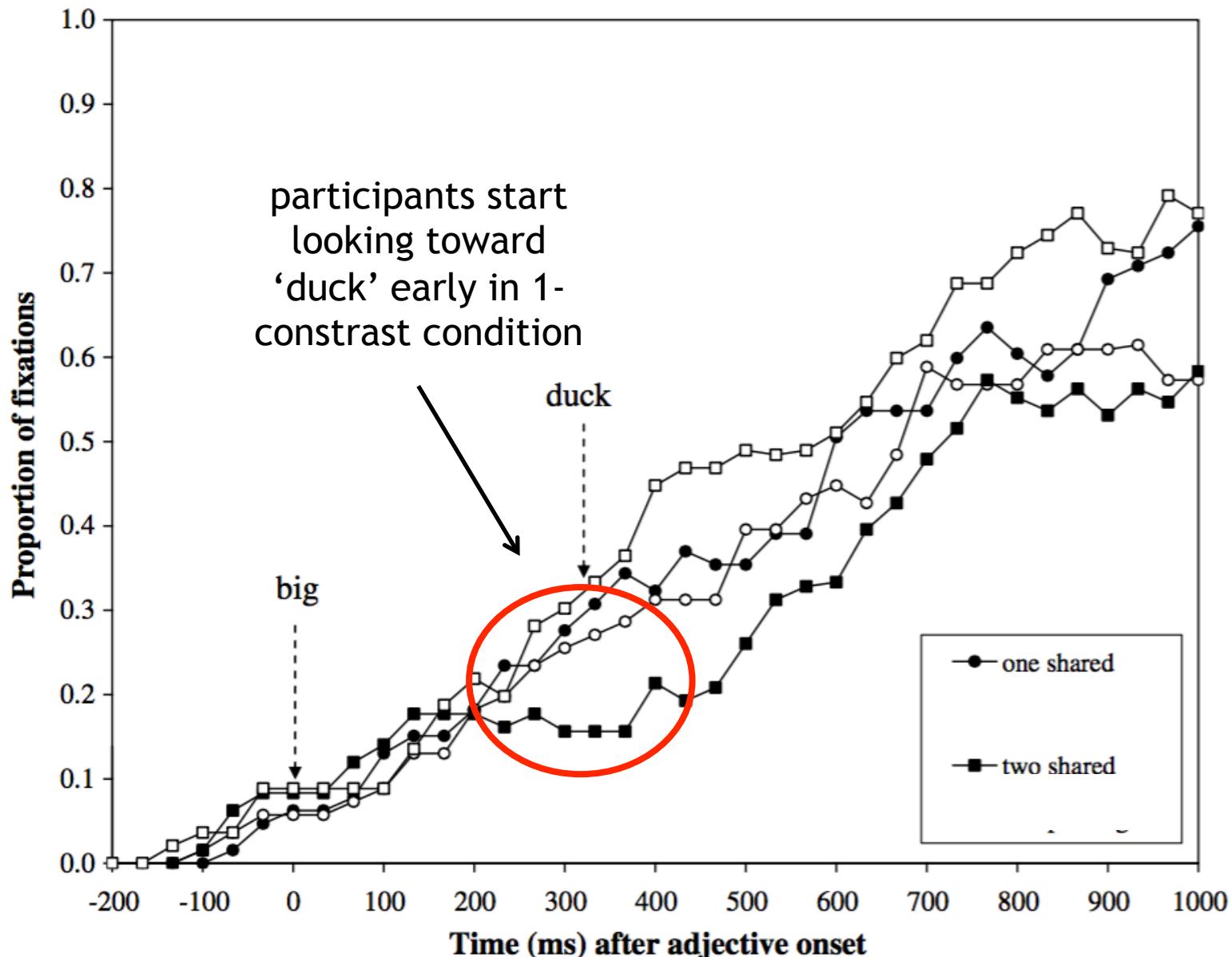
# ‘Click on the big...’

**2-contrast condition**  
have to wait until noun



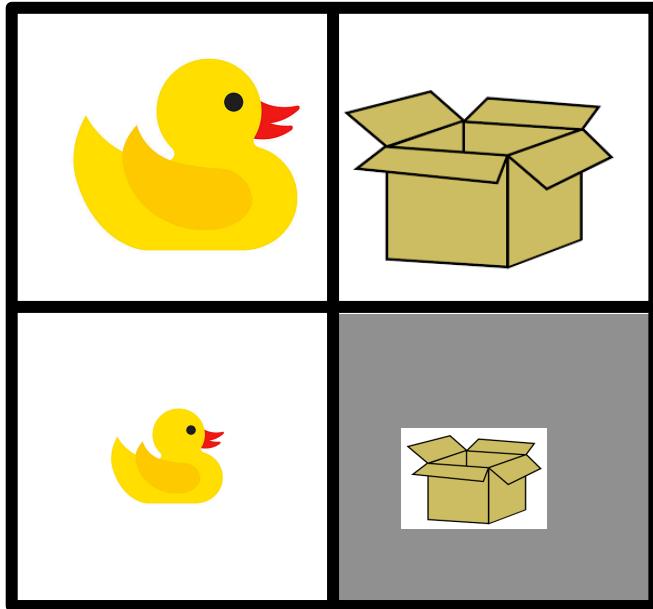
**1-contrast condition**  
‘big’ should refer to duck



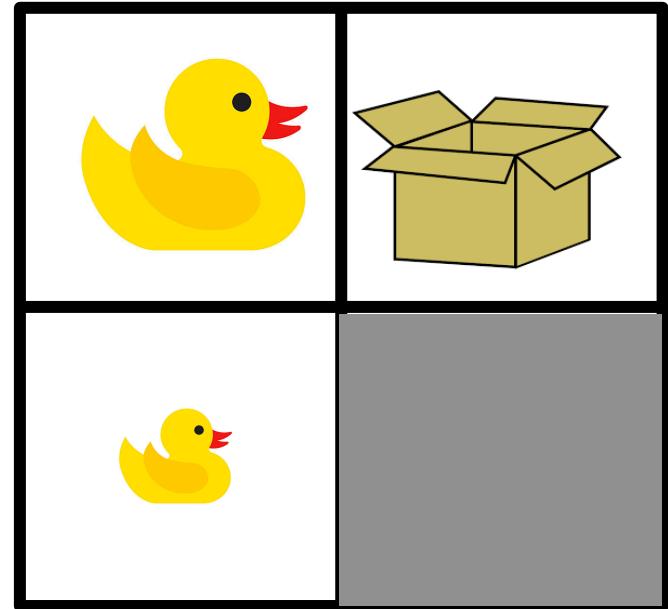


- What if not all the objects are in common ground?

## Listener's View



## Speaker's View



Small box is **NOT** in common ground  
Small box is *privileged ground* for the listener