

Introduction to embodiment

- Language has function
- Language is situated
- Interpreting language requires experiential, embodied understanding of the world
 - linguistic capabilities are created as humans form associations between linguistic forms and the objects/events they experience.
 - If so, consequences for computational systems.

Introduction to embodiment

(from McCrone)

- Social animals have complicated social structure and need to understand and anticipate actions of other members in social group.
- Chimps - less vocal than some social species (vervet) but social structure is more complex

Example - Breaking up a fight

Two females nudge dominant female (Mama), catch her eye, wave a hand toward fighting youngsters so that SHE will break up their fight (and they will not become part of the fighting)

Introduction to embodiment

- Early language may have been like chimp communication with a few expressive grunts carrying a lot of meaning. for example
“a nod toward a dying fire and a disapproving grunt would mean that the fire was going out and someone had better get some more firewood.”
- Whole of language did not have to be invented all at once. “More likely a general grunt would have stood for a very broad idea such as ‘termiting’ or ‘share the food’, serving to focus attention on the general topic of conversation.”

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- “Once early man acquired the habit of using symbols instead of waiting for the real thing to come along he started unlocking all his mental doors. He could not only rouse nets in someone else’s mind, he could also trigger nets inside his own head....He could stretch backward into his past and forward toward possible futures...”

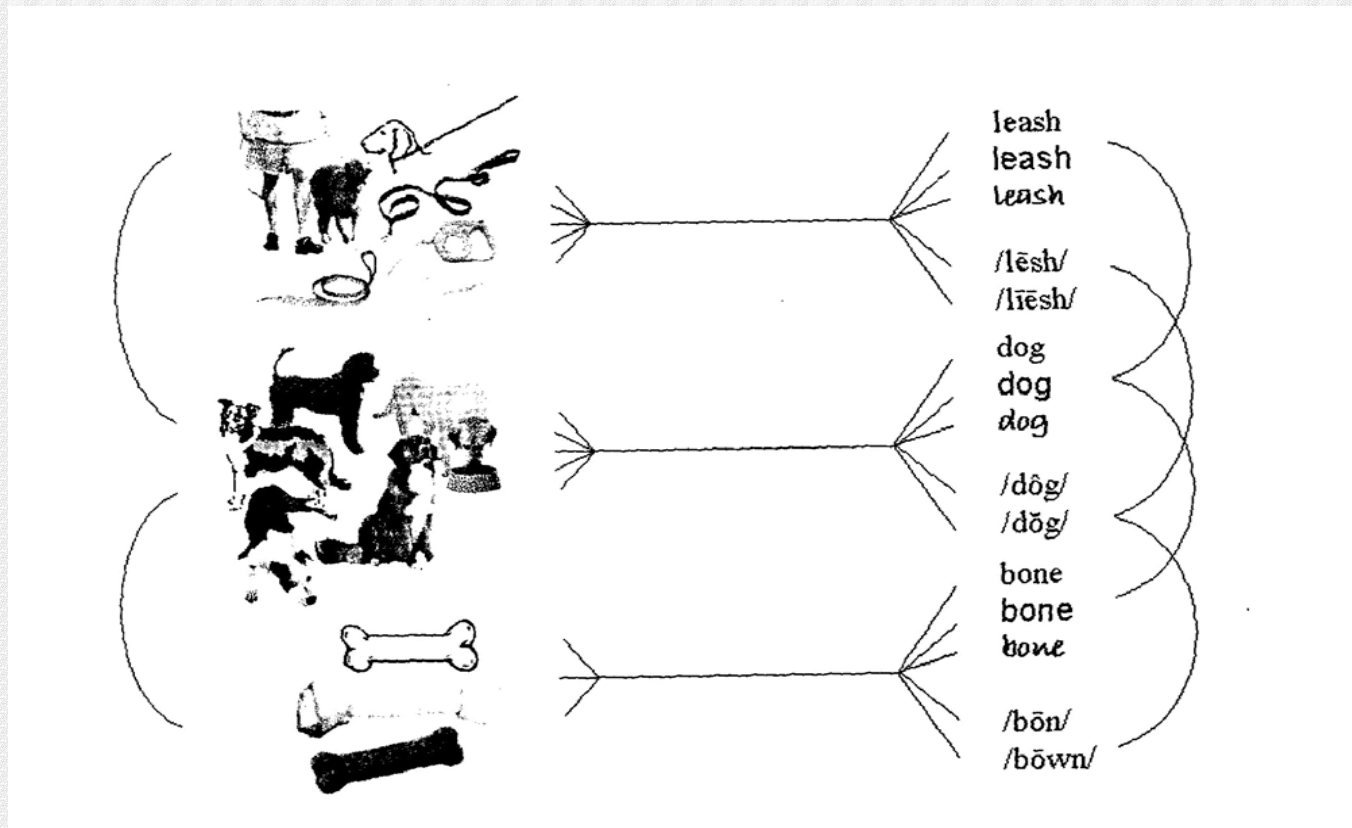
Introduction to embodiment

(Zwaan & Madden)

- “All mental representations are experiential, i.e. related to perception and action”
 - Referent representations
 - Linguistic representations
 - High level of interconnectedness

Introduction to embodiment

Representations, interconnections by associations
(Zwaan and Madden)



Introduction to embodiment

- Experiential understanding of world influences conception built up as language is interpreted.
- Nail example (Zwaan & Madden)
 - 1) John pounded the nail into the wall.
 - 2) John pounded the nail into the floor.

If the event in sentence 1 were to occur, the Nail would have a vertical orientation, sentence 2, horizontal.

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- 1) John pounded the nail into the wall.
- 2) John pounded the nail into the floor.

Subjects shown pictures of nails after reading (1) or (2) recognized nail quicker when orientation of nail in picture matched real event.



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- Is orientation an important part of meaning?
- Possibly: Imagine an interchange of this sort.
 - A: Where can I hang my coat?
 - B: John pounded a nail into the wall/*floor.

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- (McCrone)

“We may believe that our brains are swollen with facts about the history of the Roman Empire or the geography of Latin america but such schoolbook learning takes up only a few shelves in a mind stuffed with knowledge about the minute details of everyday living”

Introduction to embodiment

- Language - set of cues by which speaker/writer manipulates comprehenders attention on an actual or fictional situation
- Construal - the mental simulation of an experience conveyed by an attentional frame.
- Construal involves time and location of conceived situation, perspective (spatial psychological) from which situation is experienced, focal and background participants in event

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- Evidence for experiential basis of construal from Zwaan and Madden.
- Claims:
 - Comprehenders represent perceptual aspects of referents or situations
 - Comprehenders represent spatial relations between object parts
 - Comprehenders represent dynamic aspects of events
 - Comprehenders represent perspective

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Experiment 1: Do comprehender's represent perceptual aspects of referents such as their orientation?

- 1) John pounded the nail into the wall.
- 2) John pounded the nail into the floor.

If the event in sentence 1 were to occur, the nail would have a vertical orientation, sentence 2, Horizontal.

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Task: Subjects read sentence, then see a picture of object and decide if that object was mentioned in the sentence.

Ex 1. John pounded the nail into the wall.



No



Yes (fast)



Yes (slow)

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Ex. 2 John pounded the nail into the floor.



No



Yes (slow)



Yes (fast)

Summary: Response times faster when picture
Matched subject's expected orientational
construal.

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Experiment 2: Do comprehenders represent perceptual aspects of referents such as their shape?

1. He saw the lemon in the bowl.
2. He saw the lemon in the glass.

A lemon in a bowl is likely to be a whole lemon. A lemon in a glass is likely to be a slice or wedge.

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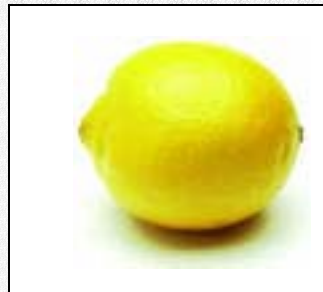
Task 1: Say if object was mentioned in sentence.

Task 2: Name the object.

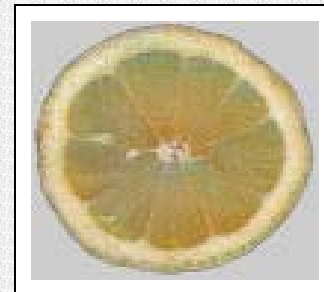
Ex. 1 He saw the lemon in the bowl.



Yes/apple



Yes/lemon
(fast)



Yes/lemon
(slow)

Response times faster when shape in picture
Matched expected construal.

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Experiment 3: Do comprehenders represent dynamic aspects of events such as the apparent size change of approaching/retreating objects?

1. The shortstop hurled the softball at you.
2. You hurled the softball at the shortstop.

Sentence 1 describes a scene in which the ball is approaching, sentence 2, retreating.

An approaching ball would appear to get larger, a retreating ball, smaller.

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Task: Read sentence. View 2 pictures separated by a mask. Decide whether objects are the same or not.

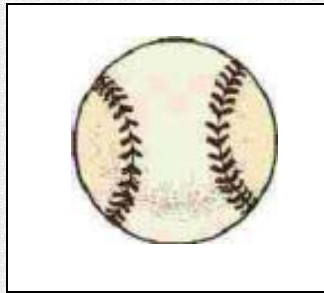
Ex. The shortstop hurled the ball at you.



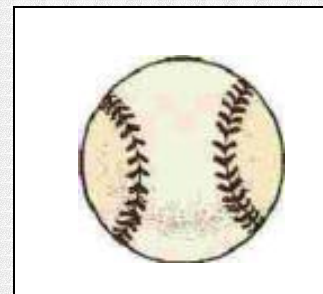
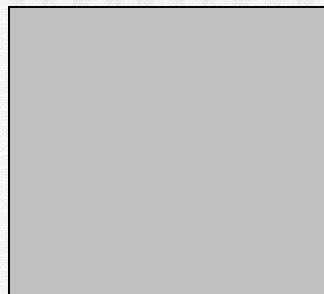
Are objects the same? No.

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The shortstop hurled the ball at you.



Are objects the same? Yes (fast)



Are objects the same? Yes (slow)

Introduction to embodiment

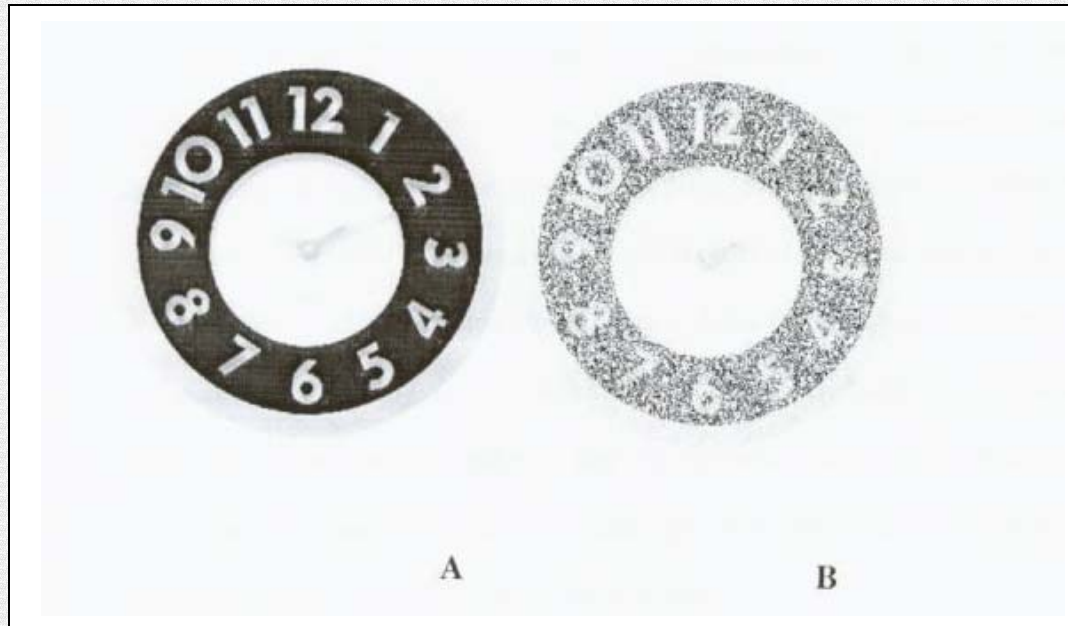
Experiment 4: Do comprehenders represent perceptual aspects of situations such as visibility conditions?

The bar keeper peered at the clock through the smoky bar.

Task: Read sentence, see picture of object.
Decide whether or not object was mentioned.

Introduction to embodiment

Ex. The bar keeper peered at the clock through the smoky bar.

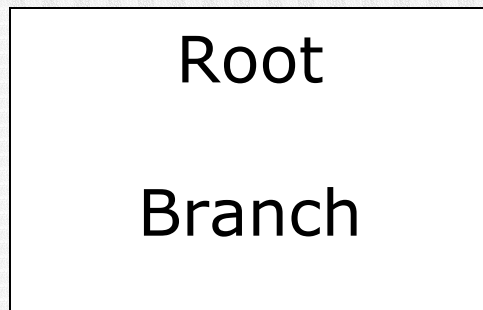


Was object mentioned in sentence?
Faster response times for B, than A.

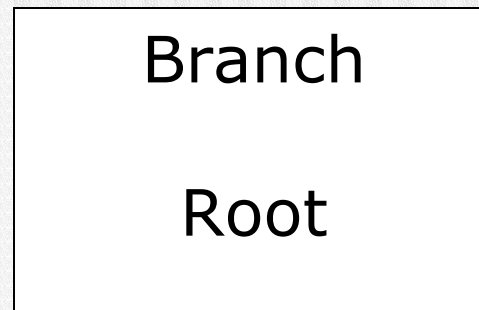
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Experiment 5: Do comprehenders represent the spatial relations between referents?

Task: subject sees a word pair on screen and decides if they are semantically related.



slow



fast

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From Zwaan and Madden

