Word learning biases

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Constraints on word learning

Quine 1960

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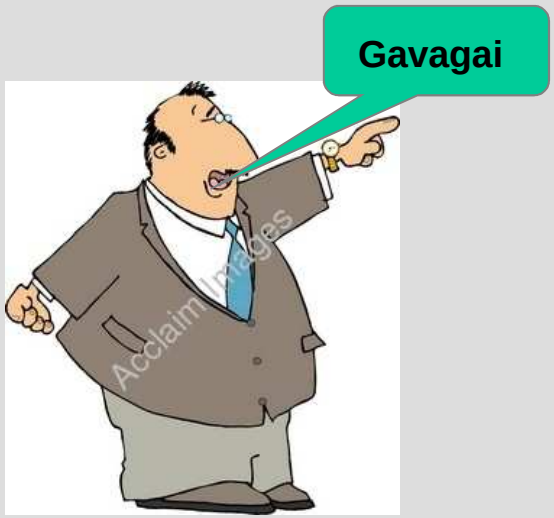
- Dog
- Poodle
- Bone
- Barking
- Blue fur
- What a stupid dog!
- I love that dog!

Constraints on word learning

- The whole object bias
- The shape bias
- The mutual exclusivity bias
- The taxonomic bias

The whole object constraint

New words are likely to refer to the whole object rather than its parts, substance etc.



Dog

The shape bias

Children are most likely to extend a novel word to a new object, if the shapes of the object overlap; that is, the shape overide other properties such as color, texture, taste, sound, etc.

Lindau, Smith, and Jones 1988

The shape bias

Lindau, Smith, and Jones 1988

The mutual exclusivity constraint

An entity cannot have more than one name.

-> Each word has ist own referent.

The principle of contrast [Clark 1997]

-> Each word has ist own sense.

Same referent but different senses:

dog – animal
tree – plant
bike – mountain bike

street – road
rise - increase
good – cool

Don't take the red tray, take the chromium tray.

Carey 1978

Familiar Object
Fish
Fire truck
Hammer
Camera
Telephone
Race car

Markman 1996

Familiar Object	Novel Noun (for part)
Fish	Dorsal fan
Fire truck	Boom
Hammer	Claw
Camera	Focusing grip
Telephone	Receiver
Race car	Air foil

Markman 1996

Familiar Object	Novel Noun (for part)	Unfamiliar Object	Novel Noun (for part)
Fish	Dorsal fan	Current detector	Detector
Fire truck	Boom	Pipe tool	Damper
Hammer	Claw	Ritual implement	Crescent
Camera	Focusing grip	Pagoda	Finial
Telephone	Receiver	Microscope	Platform
Race car	Air foil	Lung	Trachea

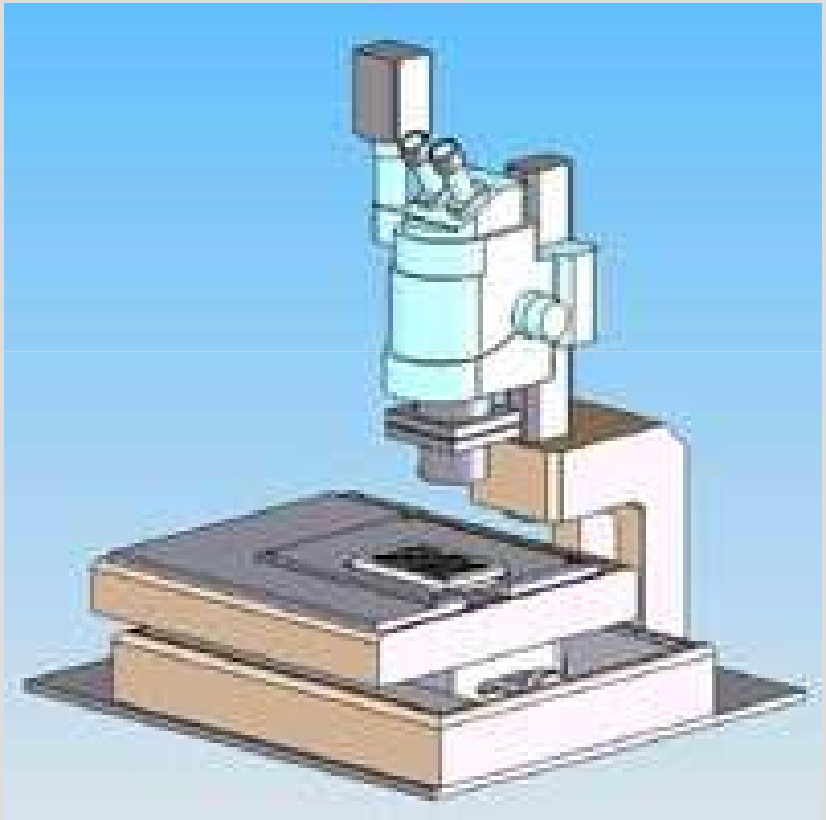
Markman 1996

Show me the *boom*.

Prediction: Since children know the word fire *truck*, they will interpret the word *boom* as label for a noticable part of the fire truck.

Show me the *platform*.

Prediction: Since children don’t know the word *microscope*, they will interpret the word *platform* (which they also don‘t know) as label for a noticable part of the microscope.



The mutual exclusivity constraint

The results confirmed the prediction:

In the familiar condition, children interpret the novel noun as a name for the salient part.

In the unfamiliar condition, children interpret the novel noun as a name for the whole object.

The mutual exclusivity constraint can override the whole object constraint.

Markman 1996

The taxonomic constraint

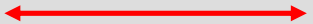
Taxonomic relationship

pig
horse
cow

paradigmatic

Thematic relationship

pig — mud
horse — stable
cow — milk



syntagmatic

The taxonomic constraint

Young children pay more attention to thematic relationships than to taxonomic relation.

However, in word learning they shift their attention from thematic to taxonomic relations.

Markmann 1996

Target	Choice picture 1 Taxonomic
Cow	Pig
Ring	Necklace
Door	Window
Crib	Adult bed
Bee	Ant
Cup	Glass
Car	Bike
Sprinkler	Watering can
Paintbrush	Crayons
Train	Bus
Dog	Cat

Target	Choice picture 1 Taxonomic	Choice picture 2 Thematic
Cow	Pig	Milk
Ring	Necklace	Hand
Door	Window	Key
Crib	Adult bed	Baby
Bee	Ant	Flower
Cup	Glass	Kettle
Car	Bike	Car tire
Sprinkler	Watering can	Grass
Paintbrush	Crayons	Easel
Train	Bus	Tracks
Dog	Cat	bone

The taxonomic constraint

Target

Taxonomic choice

Thematic choice

ADULT: I am going to show you something. See this?

No word condition

ADULT: Can you find another one?

ADULT: I am going to show you something. See this? This is a dax.

Word condition

ADULT: Can you find another dax?

The taxonomic constraint

	Percentage of correct responses	
	Taxonomic choice	Thematic choice
No word condition	25%	75%

The taxonomic constraint

	Percentage of correct responses	
	Taxonomic choice	Thematic choice
No word condition	25%	75%
Novel word condition	65%	35%

Linguistic cues

X-ing
X-ed
X-s
has X-ed
want to X

the X
a X
that X
those X-s
big X

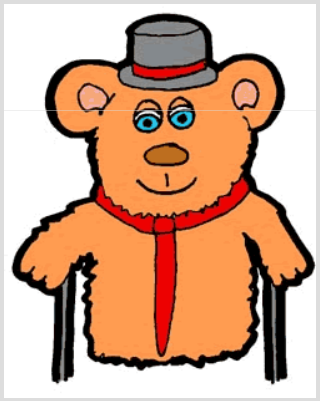
That’s Zav.

That’s a Zav.

Subjects: 1;6 year olds

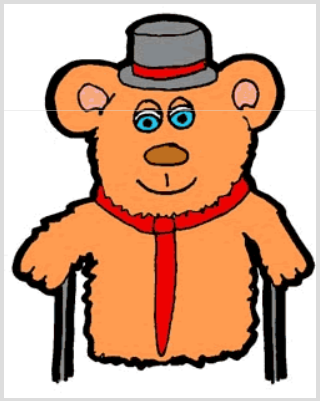
Katz, Baker and Macnamara 1974

Can you pick up Zav.



Katz, Baker and Macnamara 1974

Can you pick up a Zav.



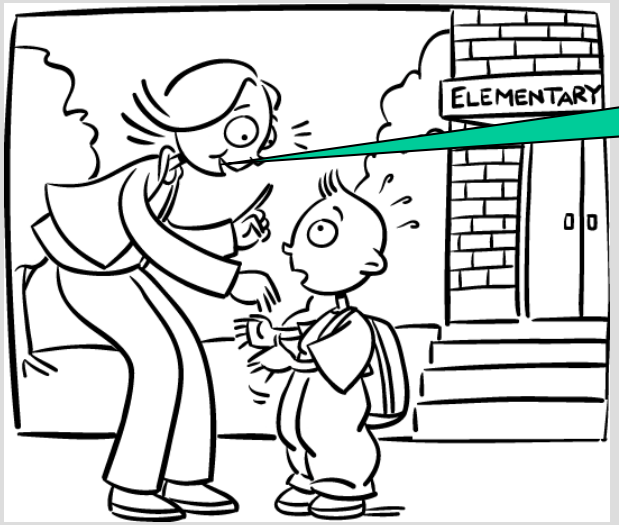
Katz, Baker and Macnamara 1974

Social-pragmatic cues

Determining the meaning of a novel word is often based on the child's ability to understand the pragmatic situation and the adult's communicative intention.

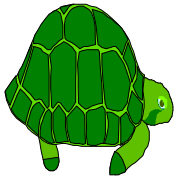
[Akthar and Tomasello 1996]

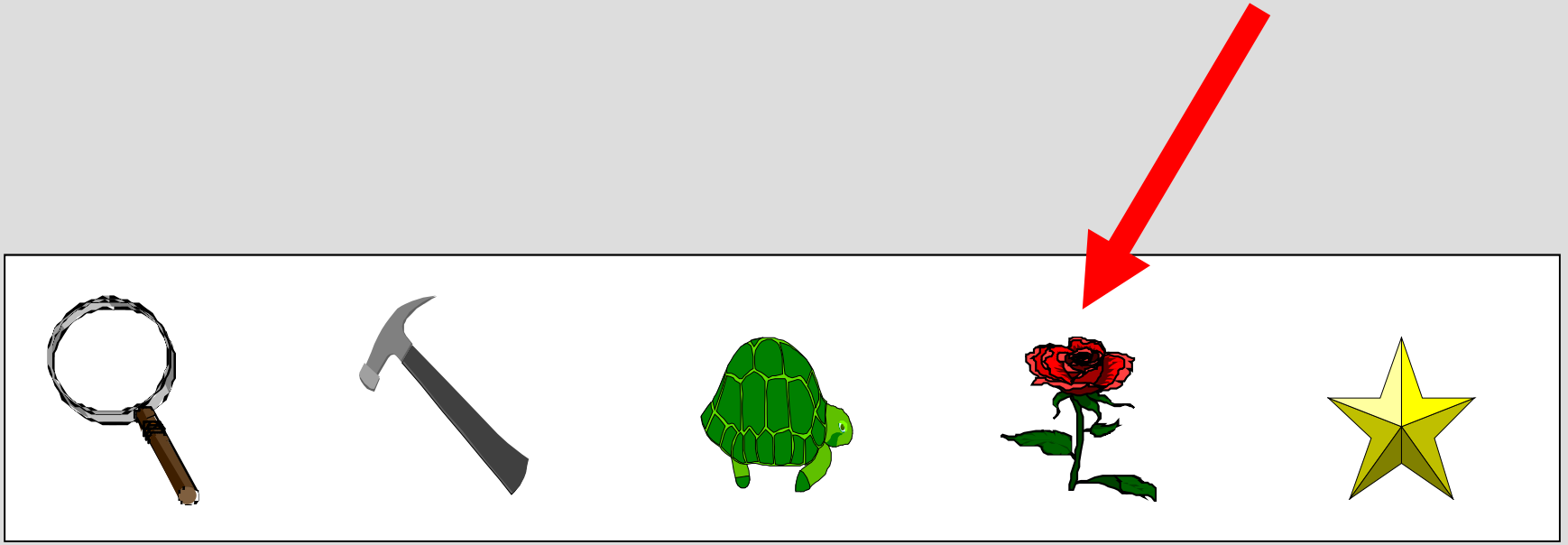
Social-pragmatic cues



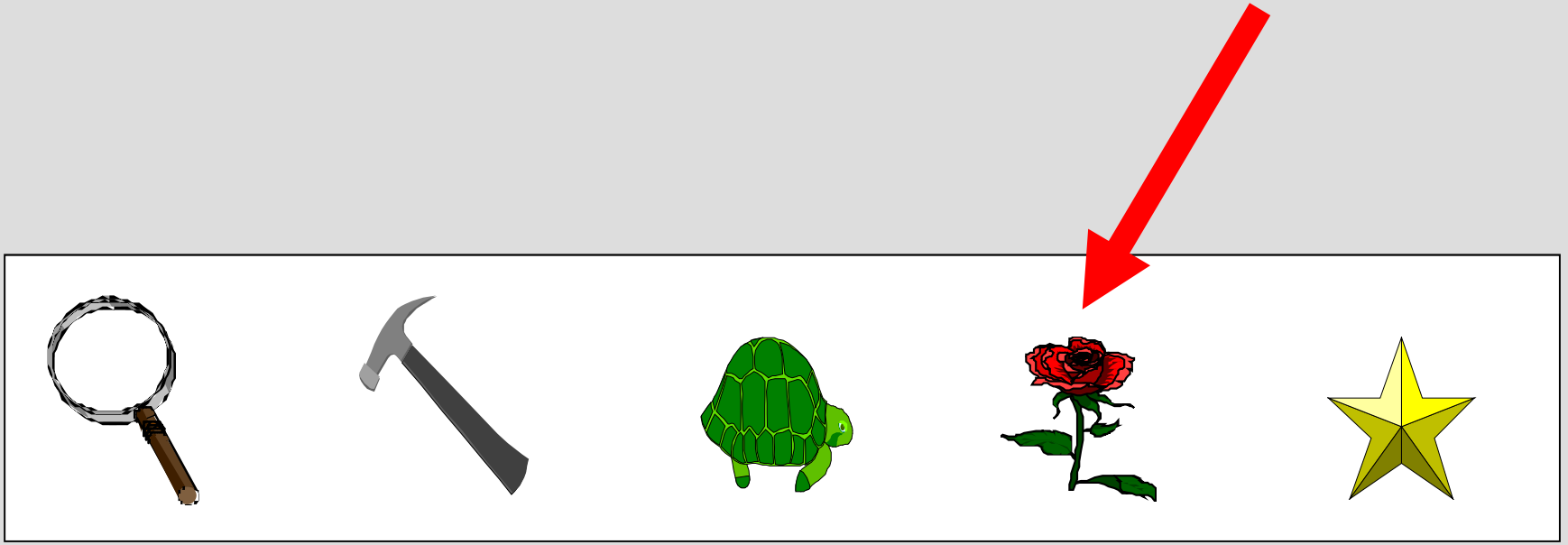
Let's go find the toma.

Subjects: 2;0 year olds



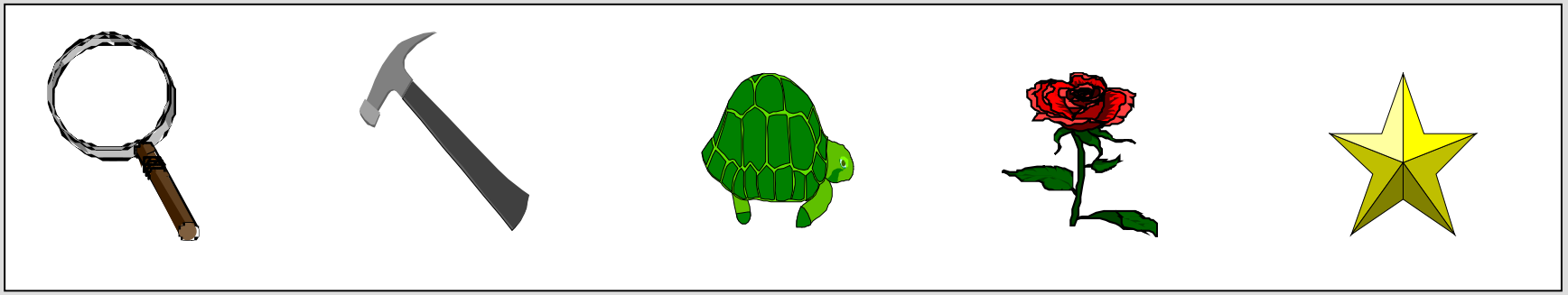


Pick up the toma.



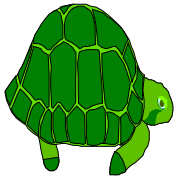
Pick up the toma.

Follow-up study: During warm-up the child is introduced to five objects in a barn without referring to these objects by names.

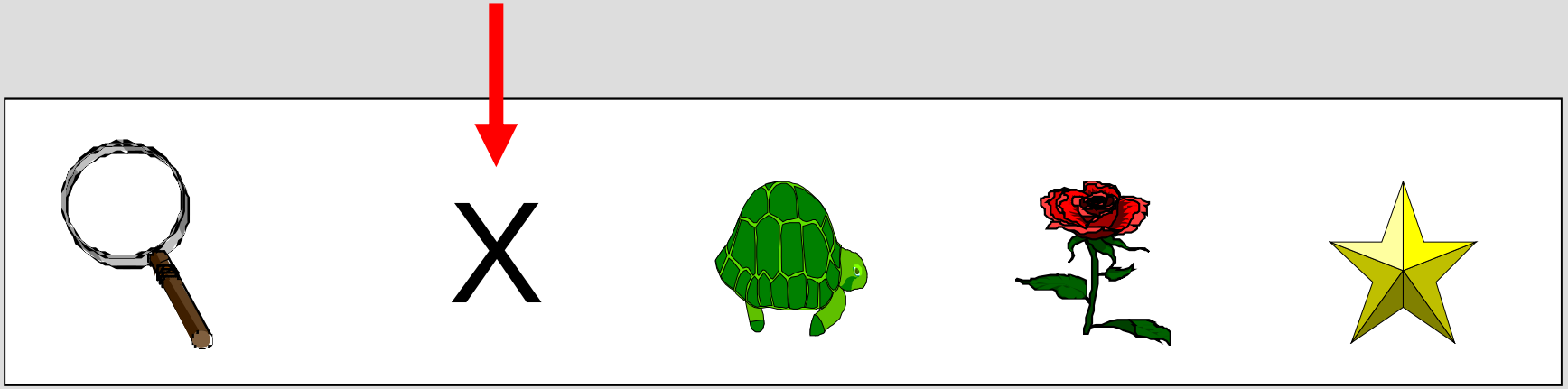


Let’s find the toma.


I can‘t open it



Let’s find the toma.



Closed door

Social-pragmatic cues

Children understood the pragmatic situation [searching for the toma], which allowed them to infer the meaning of a novel word although the word was never used with reference to a particular object.

[Akthar and Tomasello 1996]

Social-pragmatic cues

Cognitive principles/strategies that can facilitate word learning:

- Cognitive constraints [whole object bias, shape bias, mutual exclusivity constraint, taxonomic constraint]
- Linguistic cues [e.g. mass nouns vs. count nouns]
- Social-pragmatic cues