First Language Acquisition

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Developmental stages

When does language acquisition begin?

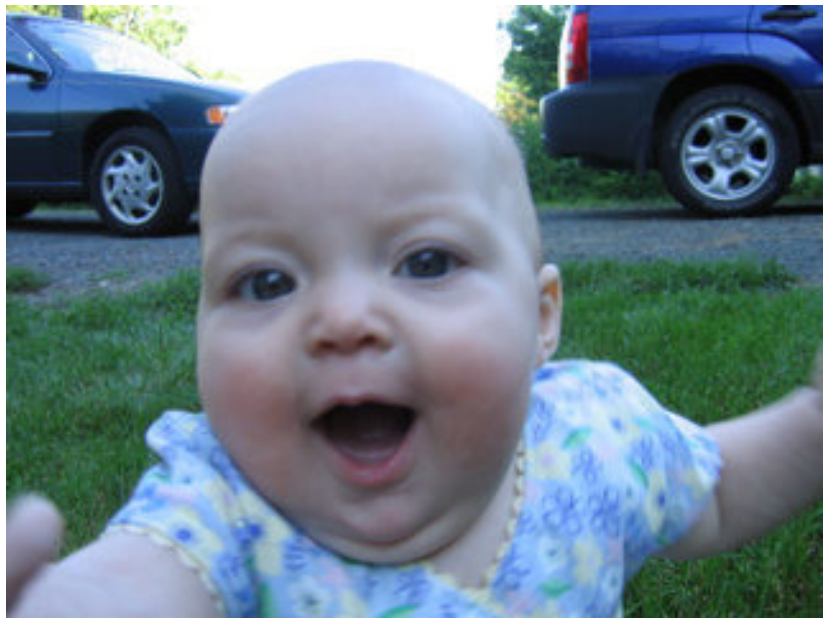
Developmental stages

High amplitude
sucking procedure

Developmental stages

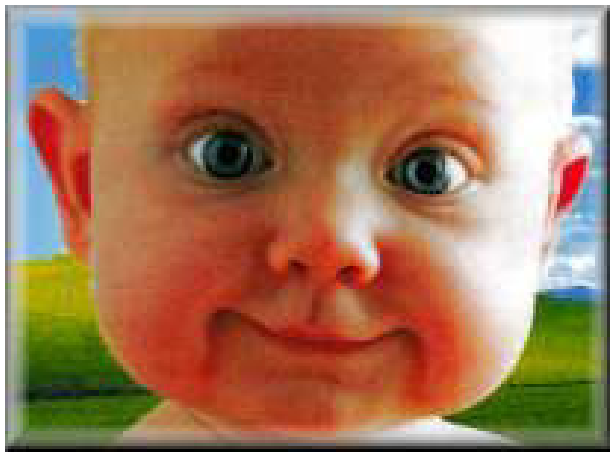
Early speech production

1. crying, coughing
2. babbling



Developmental stages

Early speech comprehension



Developmental stages

Early words:

- doggy, milk
- that, there
- up, down
- hello, bye bye

Developmental stages

Two word utterances:

- Mommy gone
- Doggy up
- Baby there
- More milk

Developmental stages

Complex sentences:

- I wanna sing.
- Think Daddy is there.
- The picture I made.

Developmental stages

> 1;0	preverbal stage
1;0 – 1;6	first words
1;6 – 2;0	first two-word utterances
2;0 – 2;5	first complex sentences

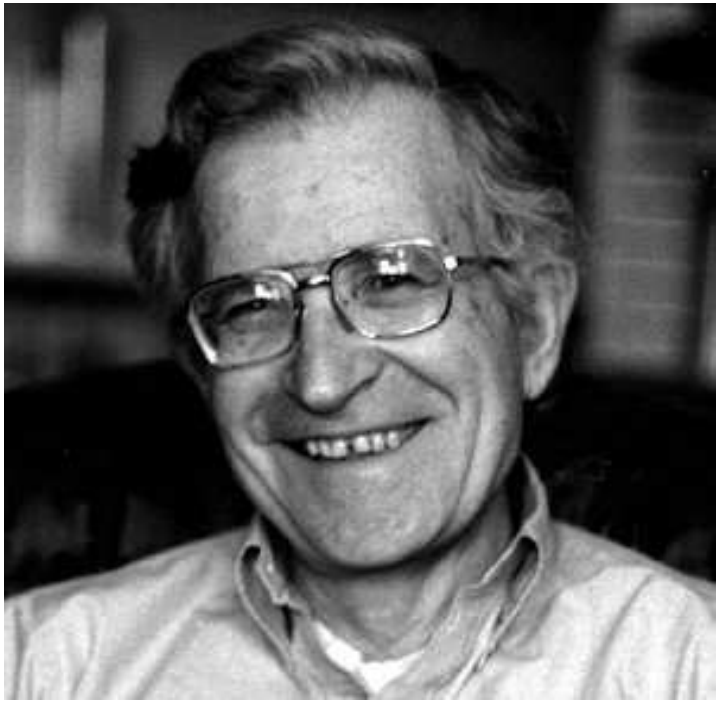
Topics

- Emergence of phonemic categories
- Emergence of grammatical categories and constructions
- Emergence of linguistic productivity

Nature and nurture

- Nativist theories: Language acquisition involves innate linguistic knowledge.
- Learning theories: Children acquire language by means of general learning mechanisms.

Nature and nurture



Noam Chomsky 1928

Jean Piaget 1996-1980

Nature and nurture

All child language researchers assume that language acquisition has genetically prespecified capacities!

But what is the nature of these capacities?

General brain power or specific linguistic categories?

Nature and nurture

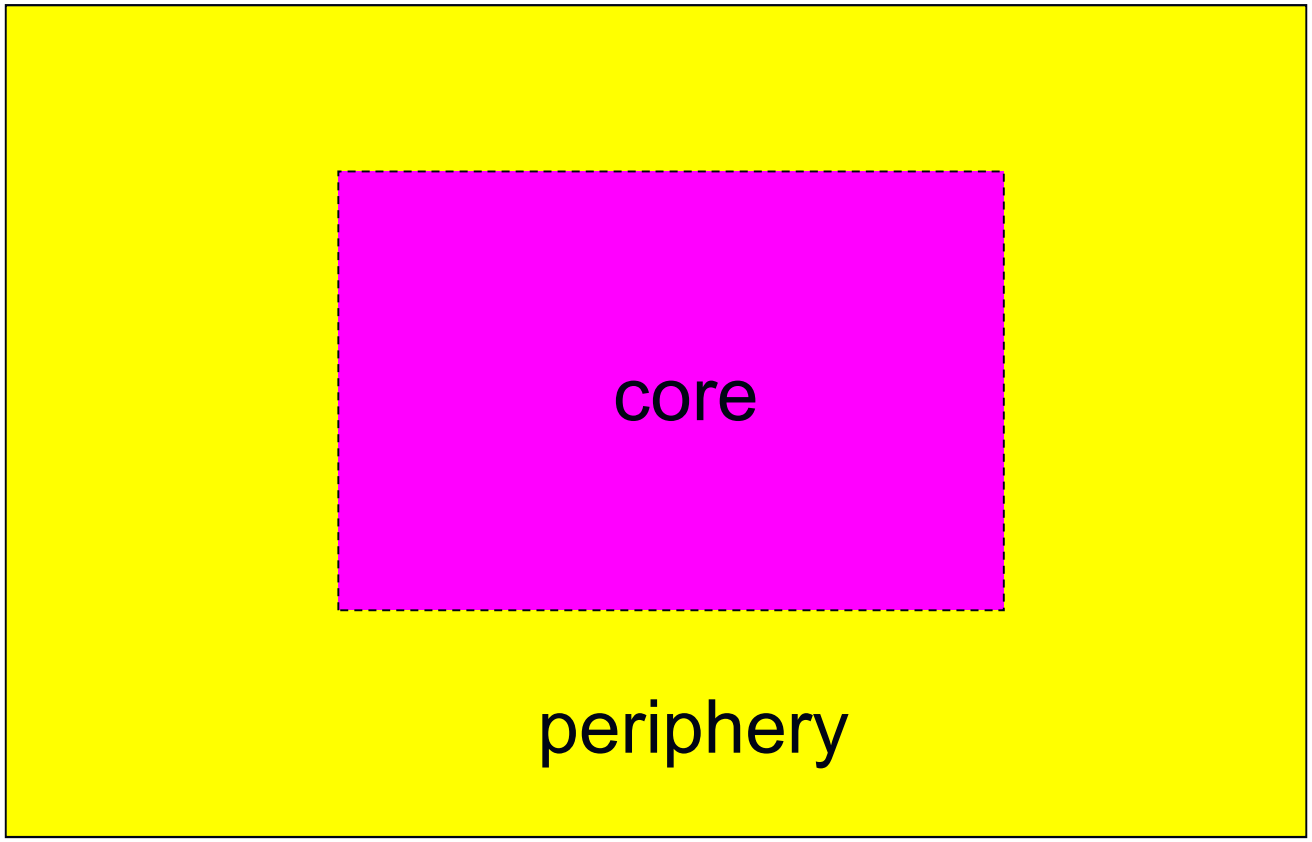
All child language researchers assume that language acquisition needs experience.

But can language be learned from experience alone?

Nature and nurture

What is innate?

Universal Grammar



Nativist theory

- Categories and principles
- Parameters

Head direction parameter

If a language uses the verb before the object (e.g. English), it is very likely that the language places words such as *in* and *at* (prepositions) before the noun and that auxiliaries precede the main verb.

at home

Head direction parameter

If on the other hand a language uses the verb after the noun (e.g. Japanese), it is very likely that the language places words such as *in* and *at* after the noun and that auxiliaries follow the main verb.

home **at**

Head direction parameter

VO-language	OV-language
V O	O V
P NP	NP P

Head direction parameter

VO-language	OV-language
V O	O V
P NP	NP P
AUX V	V AUX

Head direction parameter

VO-language	OV-language
V O	O V
P NP	NP P
AUX V	V AUX
SUB S	S SUB

Head direction parameter

VO-language	OV-language
V O	O V
P NP	NP P
AUX V	V AUX
SUB S	S SUB
ART N	N ART

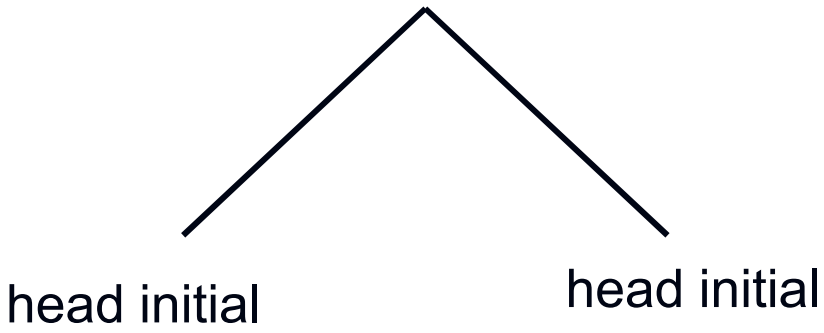
Head direction parameter

VO-language	OV-language
V O	O V
P NP	NP P
AUX V	V AUX
SUB S	S SUB
ART N	N ART
N REL	REL N

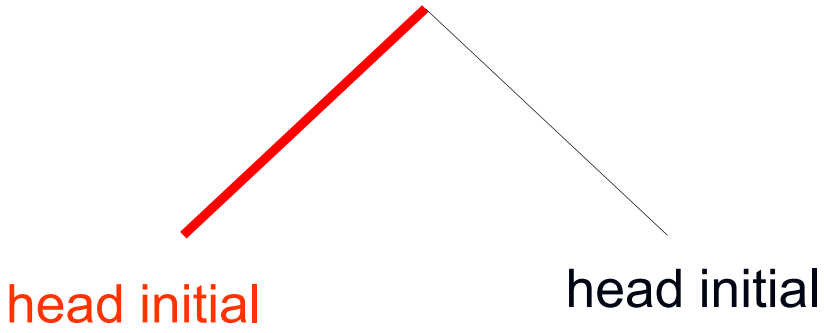
Head direction parameter

VO-language	OV-language
V O	O V
P NP	NP P
AUX V	V AUX
SUB S	S SUB
ART N	N ART
N REL	REL N
V COMP	COMP V

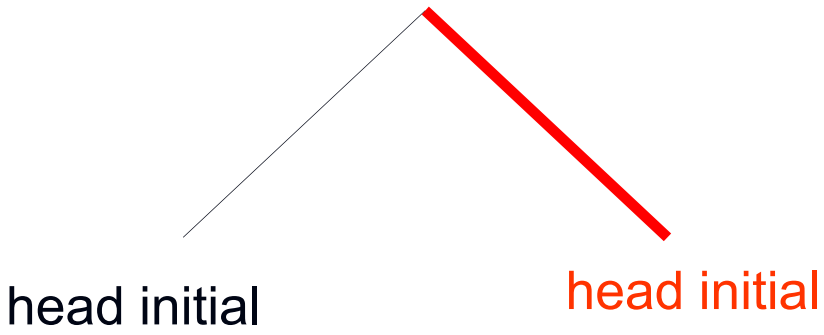
Head direction parameter



Head direction parameter



Head direction parameter

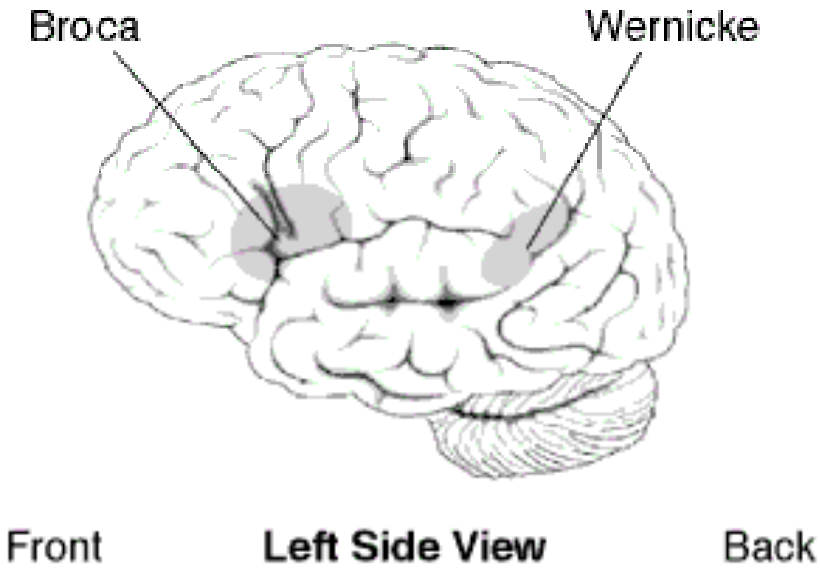


What is the evidence for linguistic innateness?

The innateness hypothesis

The uniqueness of human language

The innateness hypothesis

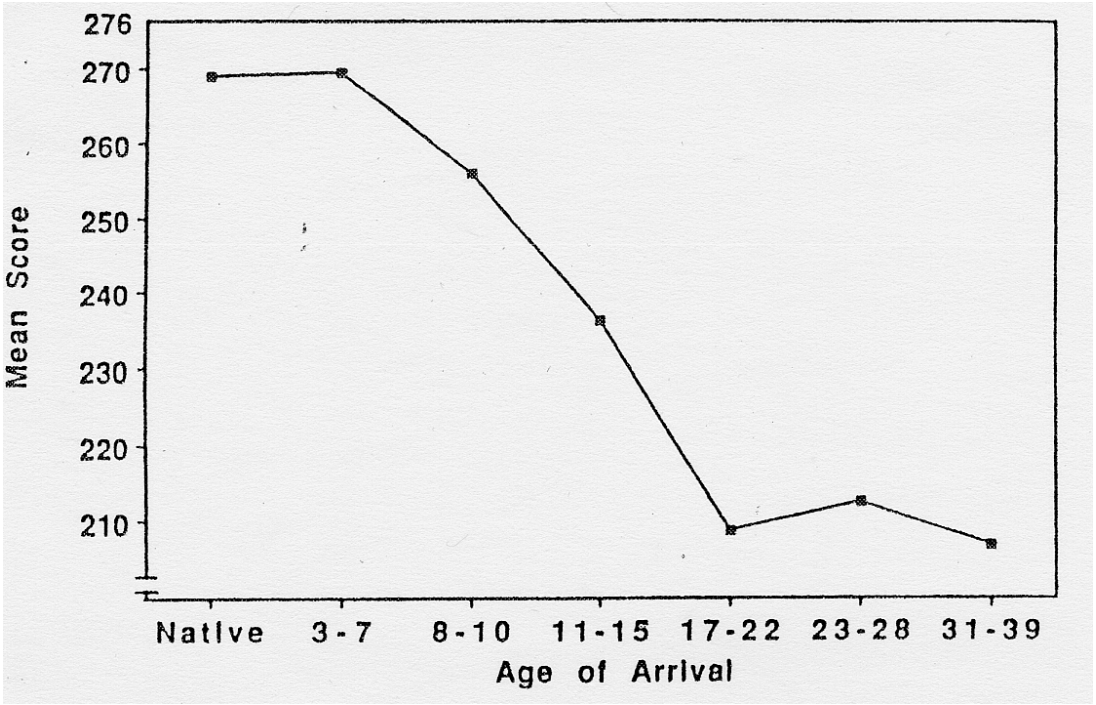


Specialized brain areas (Broca's or Wernicke's area)

The innateness hypothesis

Particular linguistic impairments (SLI children)

The innateness hypothesis



Critical period

The innateness hypothesis

The poverty of the stimulus

The innateness hypothesis

- Positive evidence
- Negative evidence

The poverty of the stimulus

Chomsky:

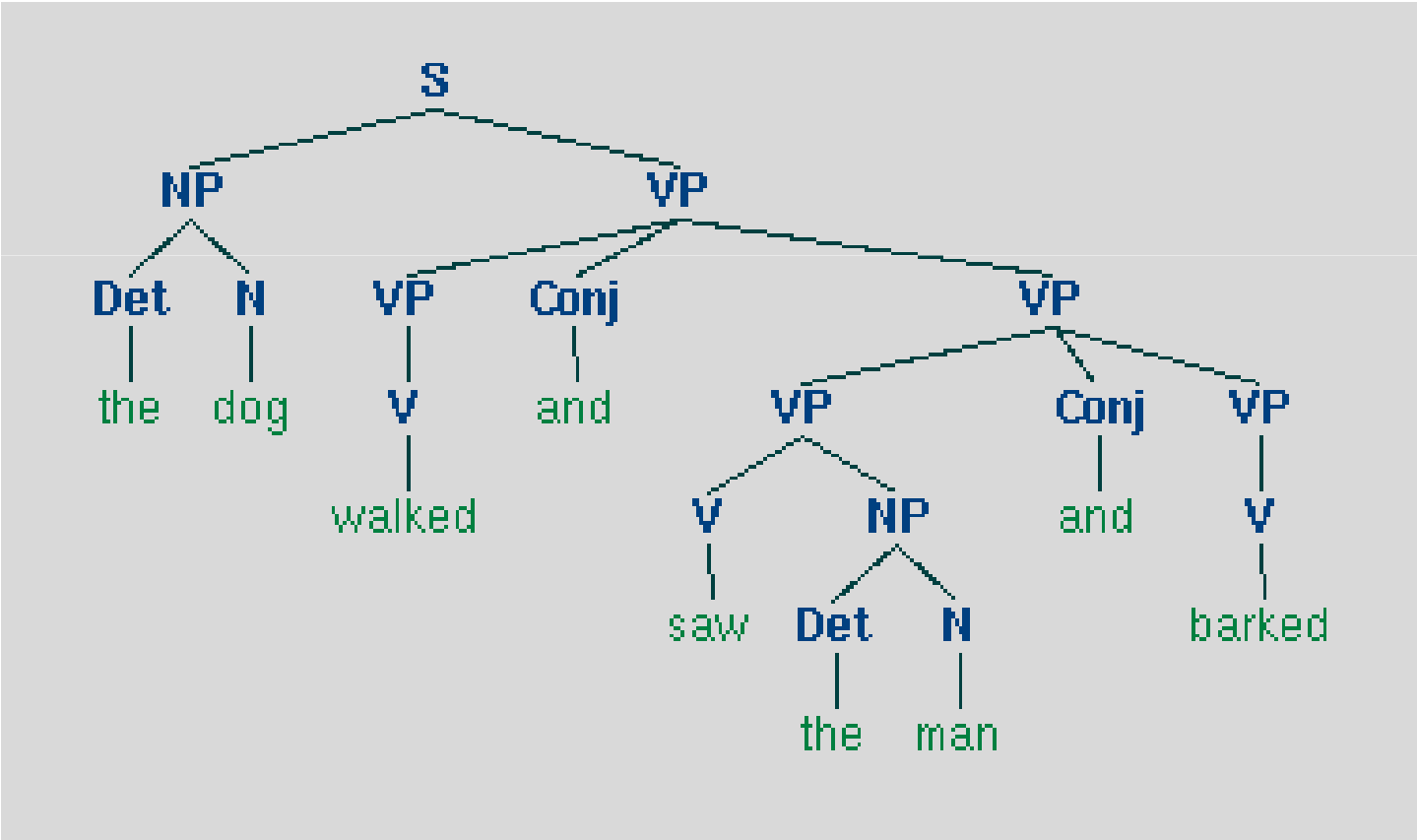
> There is an enormous gap between the grammatical system of adult language and the “meager and degenerated input” children experience.

The innateness hypothesis

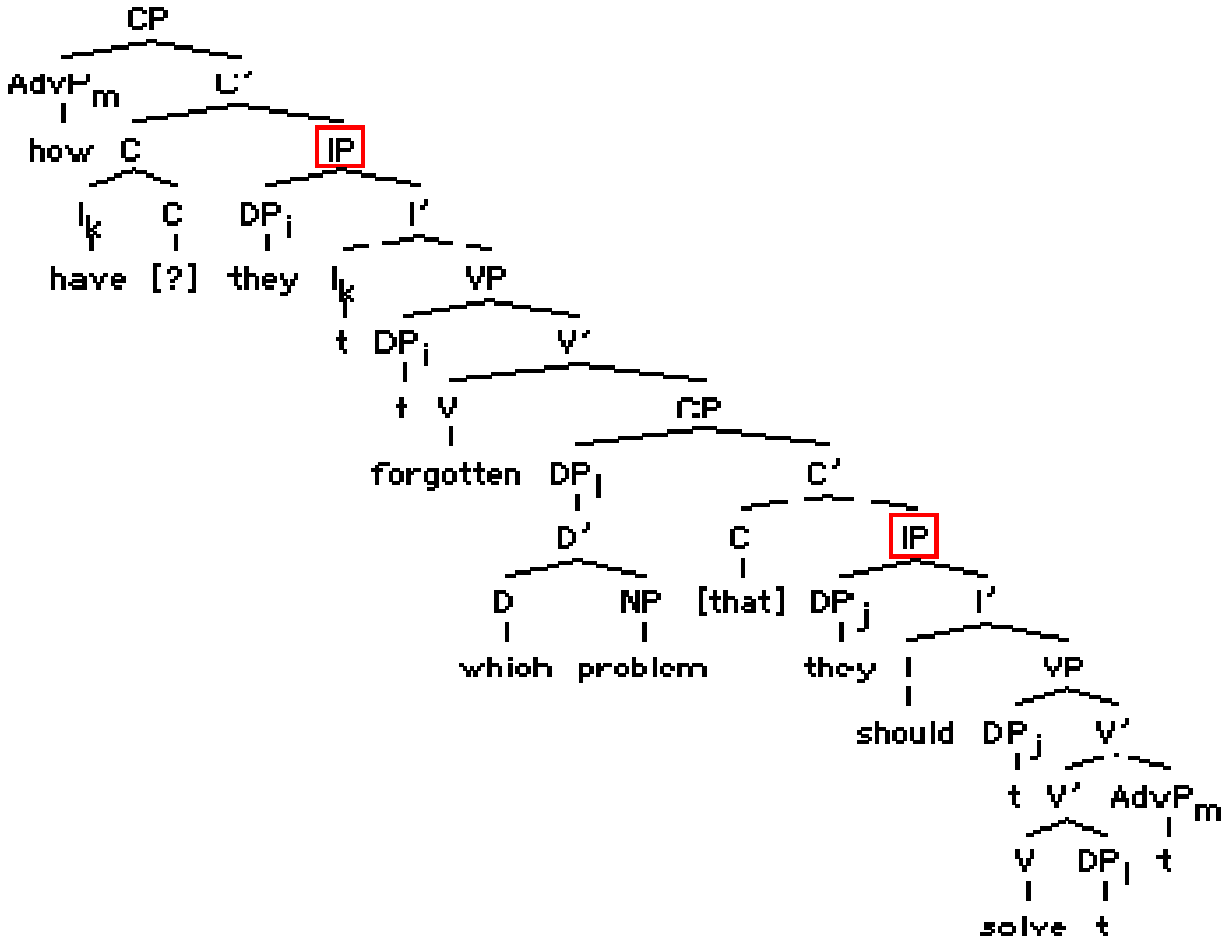
Arguments against the argument from the poverty of the stimulus:

→ The apparent gap is largely due to Chomsky's view of grammar.

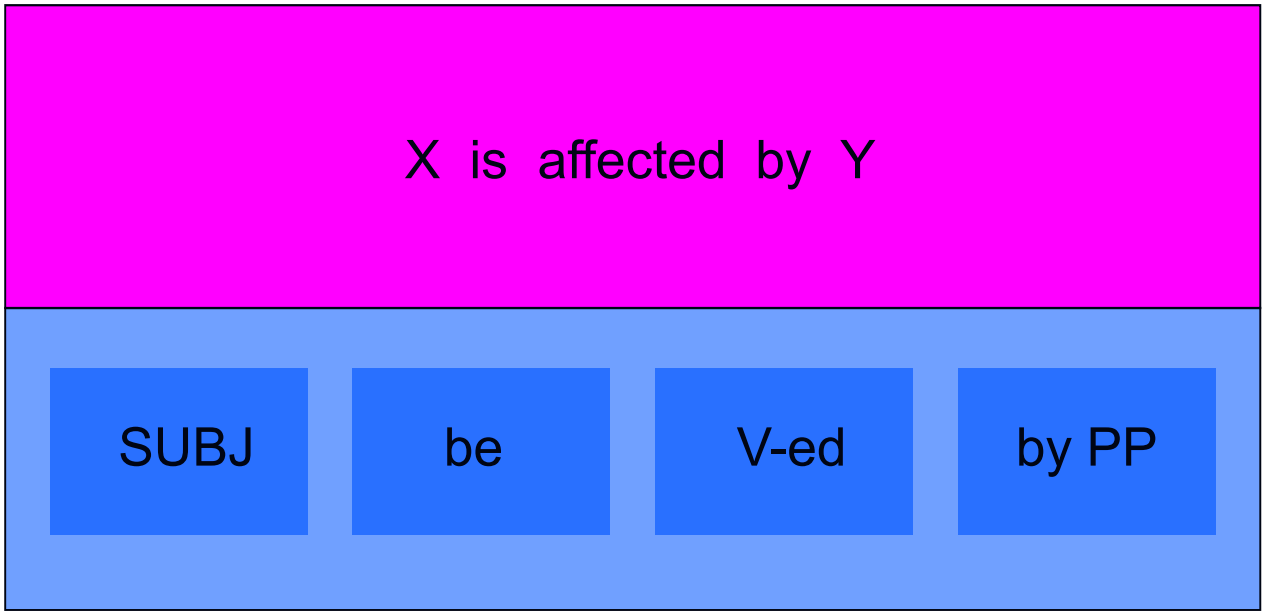
Syntactic representations



Syntactic representations



Passive construction



The innateness hypothesis

Arguments against the argument from the poverty of the stimulus:

- The apparent gap is largely due to Chomsky's view of grammar.
- Nativist theory underestimates the power of inductive learning.
- Nativists overestimate the speed of language acquisition.

Negative evidence

Negative evidence

(1) Sally goed home.

(2) Think doggy __ naughty.

(3) I falled the spoon.

Negative evidence

Do parents correct the linguistic mistakes of their children?

Negative evidence

CHILD: Want other one spoon, daddy.
FATHER: You mean, you want the other spoon.
CHILD: Yes, I want the other one spoon.
FATHER: Can you say ‘the other spoon’?
CHILD: other … one … spoon.
FATHER: Say ‘other’.
CHILD: Other.
FATHER: ‘Spoon’.
CHILD: Spoon.
FATHER: ‘Other spoon’.
CHILD: Other … spoon. [end of the game]
CHILD: Now give me the other one spoon.

Indirect negative evidence

Parents often repeat their children's utterances when they are linguistically incorrect, implicitly correcting the error.

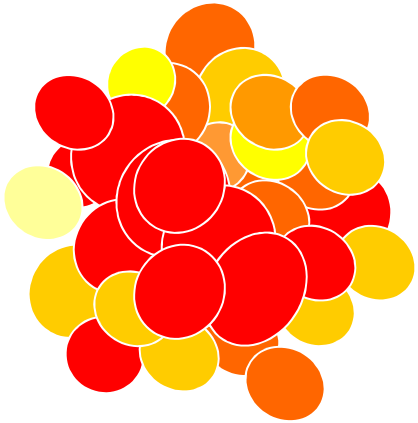
General learning mechanisms

Imitation

Emulation

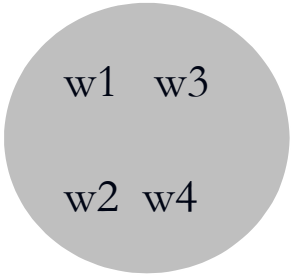
Exemplar learning

Exemplar learning

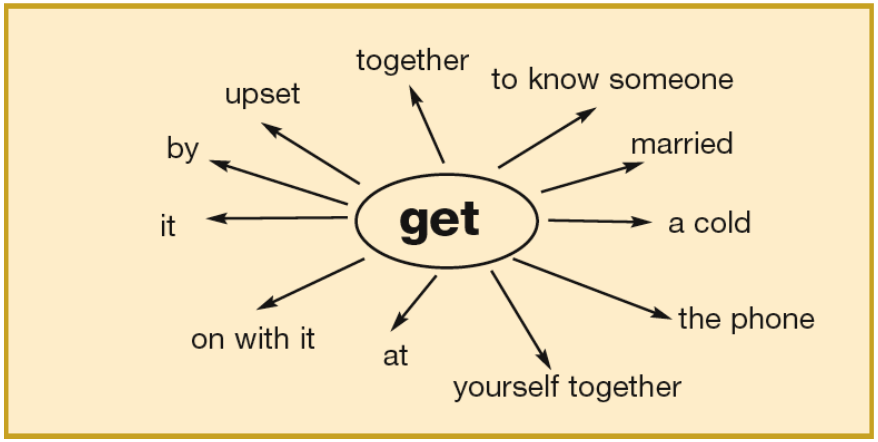


Automatization

$w_1\ w_2\ w_3\ w_4\ w_5\ \ldots.$



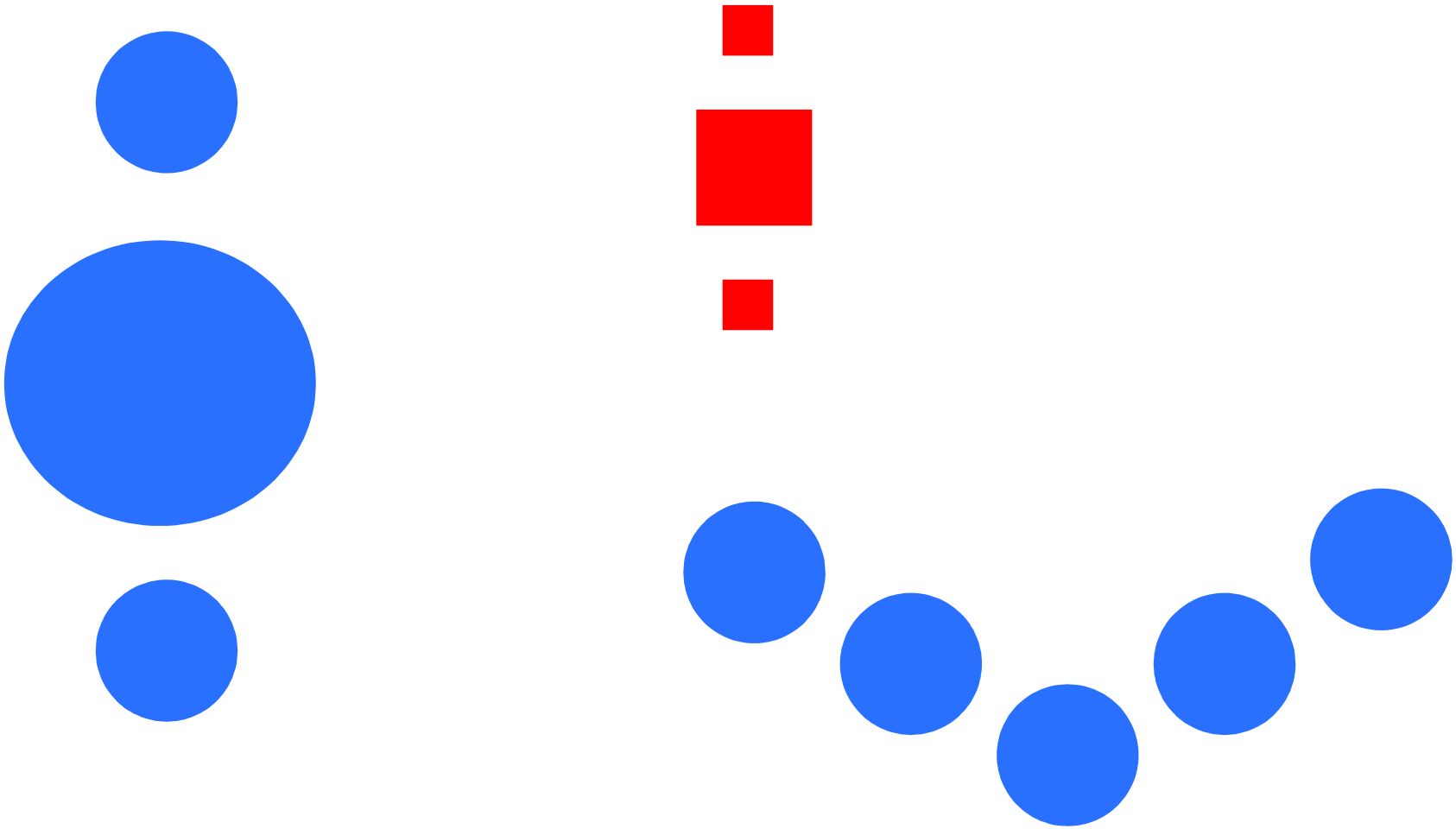
Frequently used strings of linguistic elements are converted into chunks (i.e. collocations, chunks)



Analogy

Walk	->	Walked
Talk	->	Talked
Cook	->	Cooked
Click	->	Clicked
Meek	->	Meeked

Analogy



The poverty of the stimulus

Nativist theories	Learning theories
• Grammar is innate	• Grammar is not innate

The poverty of the stimulus

Nativist theories	Learning theories
• Grammar is innate • Language-specific learning mechanisms i.e. parameter-setting	• Grammar is not innate • General learning mechanisms e.g. analogy and automatization

The poverty of the stimulus

Nativist theories	Learning theories
• Grammar is innate • Language-specific learning mechanisms i.e. parameter-setting • Grammatical development needs very little data	• Grammar is not innate • General learning mechanisms e.g. analogy and automatization • Grammatical development needs robust data

The rise of phonological categories

The rise of phonological categories

English	[ba] – [da]
Hindi	[ʈa] – [ta]
Nthlakapmx	[k’i] – [q’i]

Werker and Tees (1984)

The rise of phonological categories

German [ʏ] – [u]

Tür - Tour

Polka and Werker (1994)

The rise of phonological categories

Japanese [l] – [r]

Tsushima et al. (1994)

Use it or lose it!

The rise of phonological categories

attractor

The rise of phonological categories

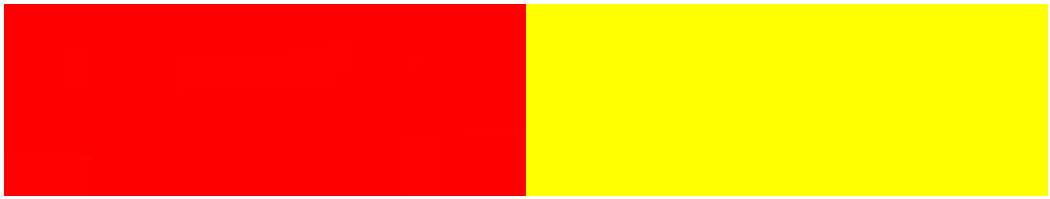
attractor

Exemplar theory/view

attractor

Categorical perception

Continuous perception

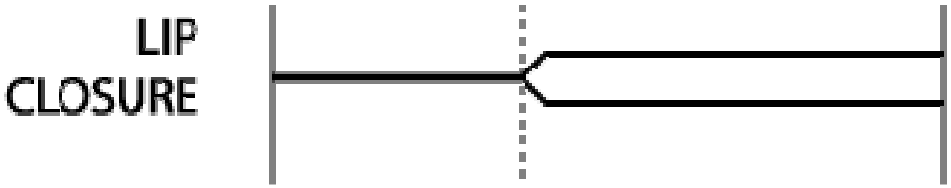


Categorical perception

Categorical perception

Liberman 1957

VOT voice onset time



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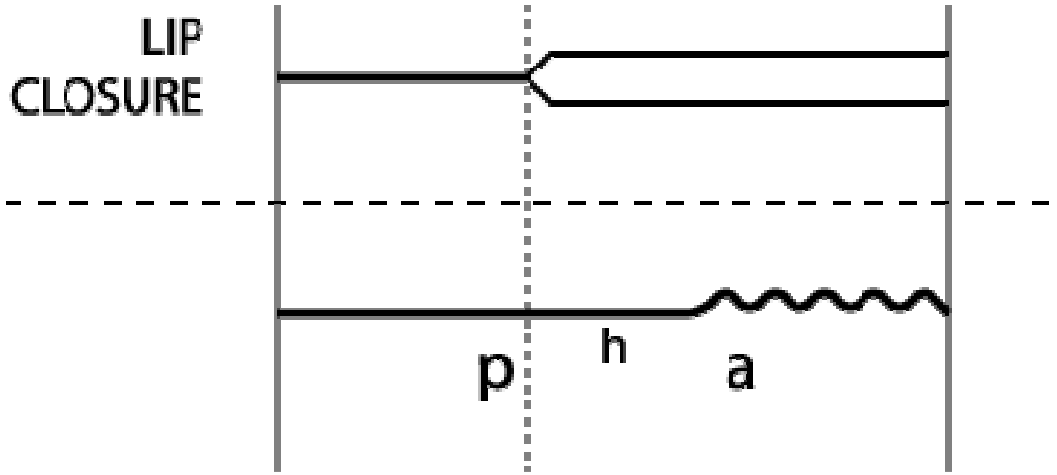

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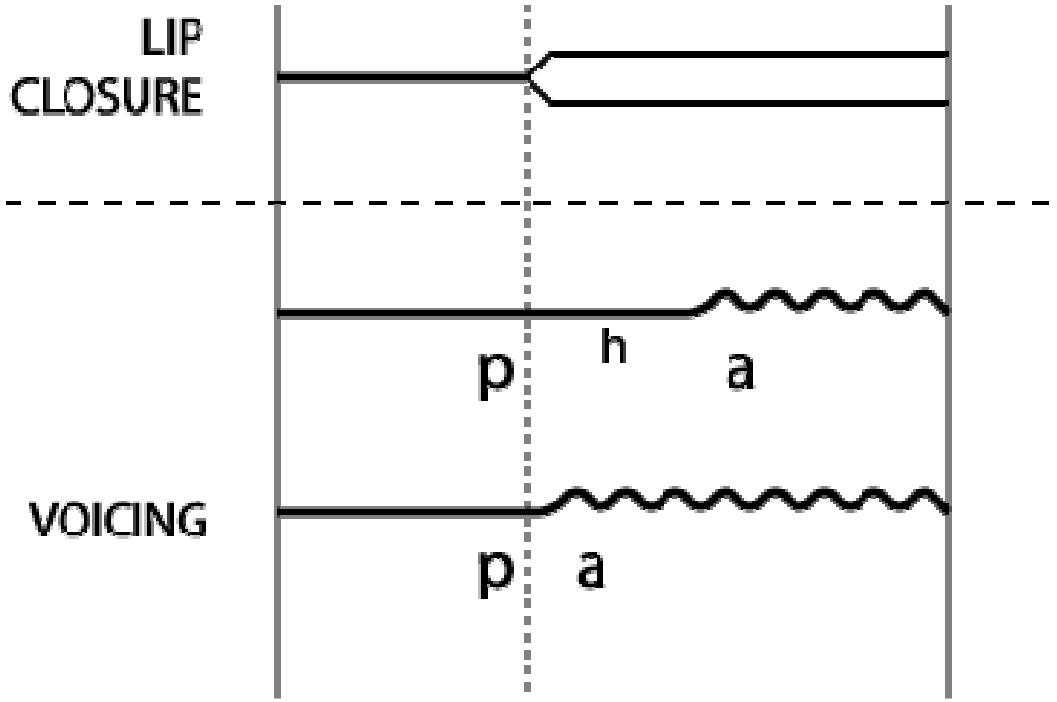

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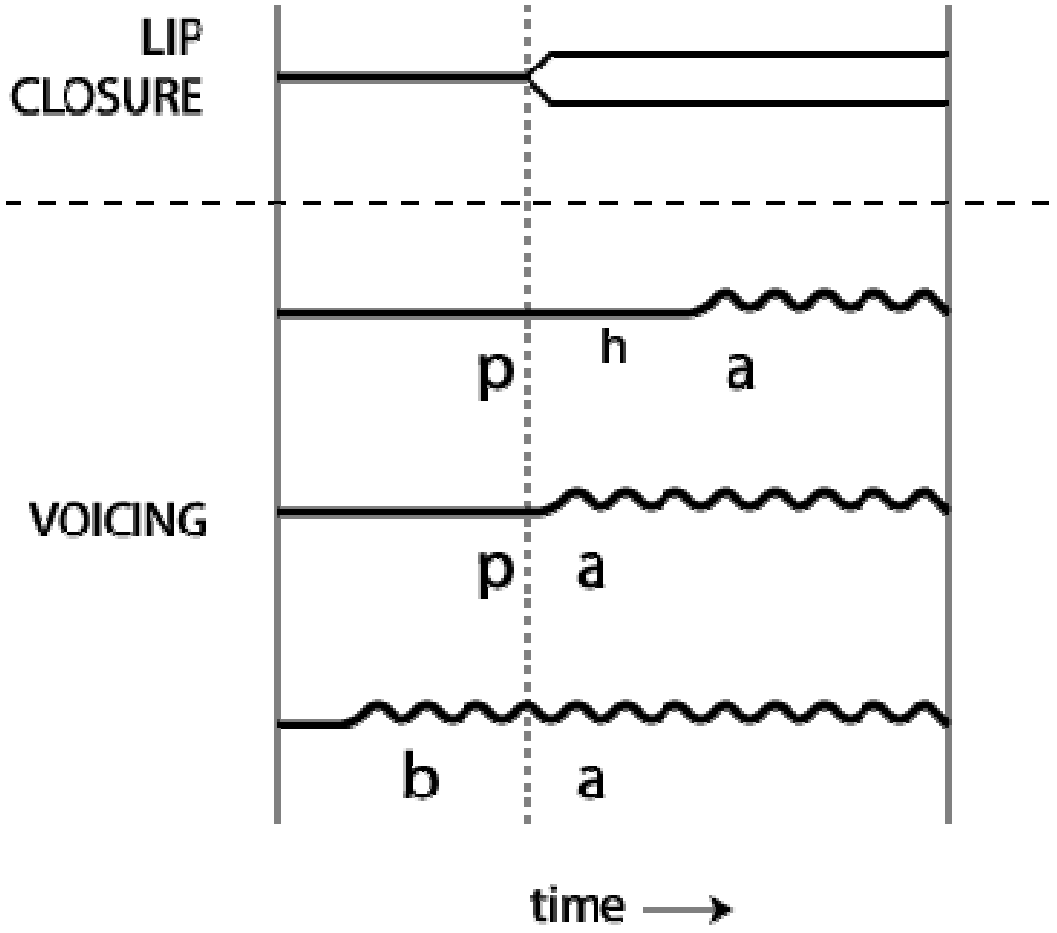
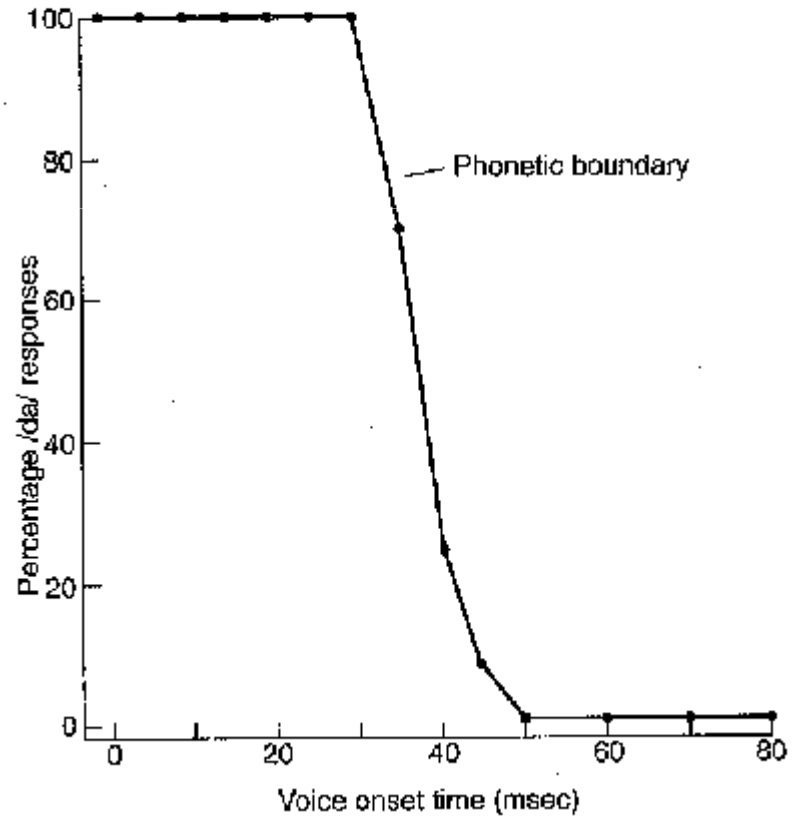


Categorical perception



Categorical perception

Liberman 1957

Categorical perception

Like adult speakers of English, English infants perceive the gradual transition from [p] to [b] categorically.

Eimas et al. 1971

Categorical perception

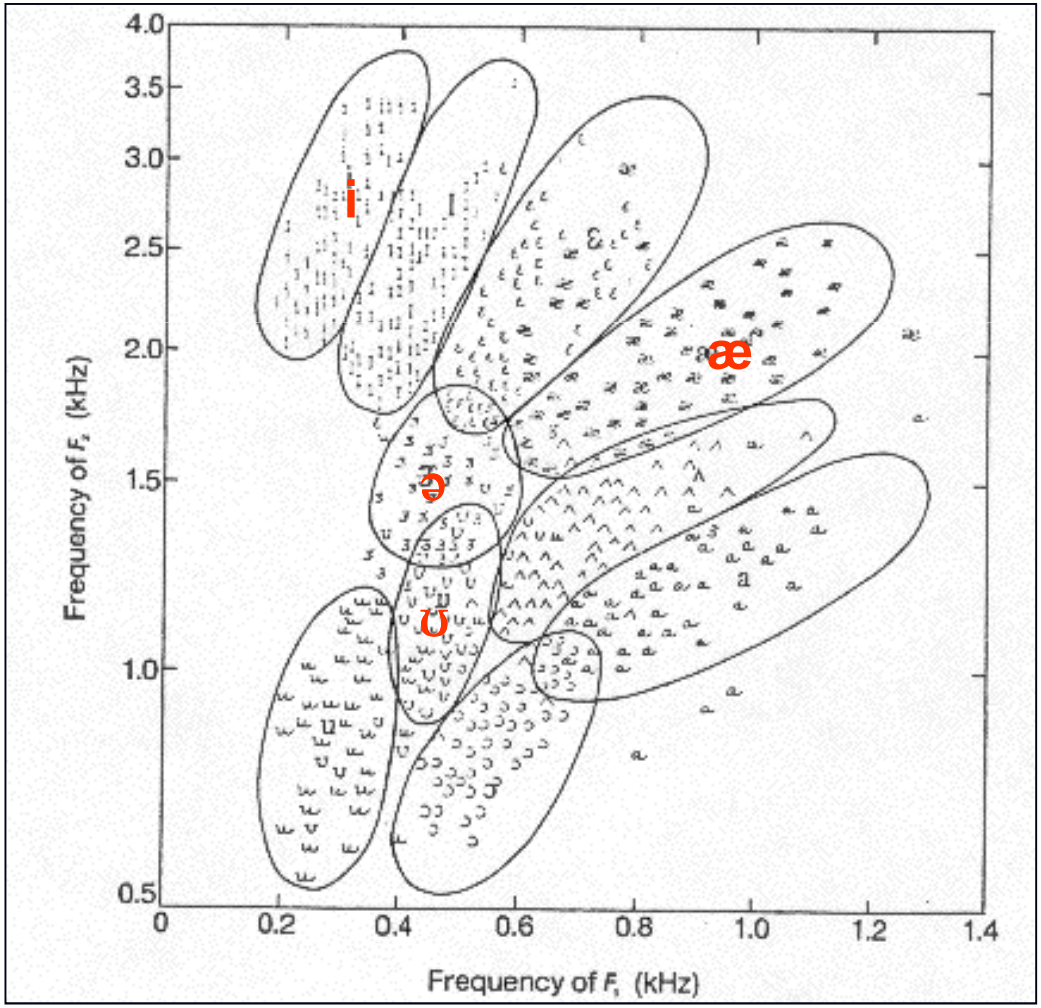
Categorical perception is a unique human capacity and restricted to language.

Eimas et al. 1971

Categorical perception

- Categorical perception also occurs in other species.
- Categorical perception is not restricted to speech.
- Categorical perception is not characteristic of all speech sounds.

Categorical perception



The rise of grammatical categories

The rise of grammatical categories

How do children acquire grammatical categories such as nouns and verbs?

Nouns tend to denote persons, animals, and things; verbs tend to denote events and situations.

Exceptions: *fight, peace, happiness – own, believe, is*

The rise of grammatical categories

Nouns and verbs occur in specific contexts. These contexts may help the child to learn grammatical categories.

Distributional learning

How do children acquire their native language? My research focuses on the kinds of learning abilities required to master the complexities of language. Three broad issues characterize my work. One line of research asks what kinds of learning emerge in infancy. A second line of research probes the biases that shape human learning abilities, and the relationship between these biases and the structure of human languages. A third issue concerns the extent to which the learning abilities underlying this process are specifically tailored for language acquisition. Related research concerns infant music perception, and the relationship between music and language learning.

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Distributional learning

(1) Milk is white.
(2) Cars are expensive
(3) We like oranges.
(4) Did Sally say that?

Pinker (1984): Semantic cues are not sufficient to learn parts of speech.

Distributional learning

Redington et al. (1998)

Corpus: CHILDES (2.5 million words)

1000 most frequent words in the ambient language

Distributional learning

Distributional context: 2 words preceding + 2 words following the target word:

x the __ of x

in the __ x x

I have __ x x

Bigram statistics

Distributional learning

	Context w. 1 (the __ of)
Target w. 1	210
Target w. 2	376
Target w. 3	0
Target w. 4	1
Etc.	

Distributional learning

	Context w. 1 (the __ of)	Context w. 2 (at the __ is)
Target w. 1	210	321
Target w. 2	376	917
Target w. 3	0	1
Target w. 4	1	4
Etc.		

Distributional learning

	Context w. 1 (the __ of)	Context w. 2 (at the __ is)	Context w. 3 (has __ him)
Target w. 1	210	321	2
Target w. 2	376	917	1
Target w. 3	0	1	1078
Target w. 4	1	4	987
Etc.			

Distributional learning

	Context w. 1 (the __ of)	Context w. 2 (at the __ is)	Context w. 3 (has __ him)	Context w. 4 (He __ in)
Target w. 1	210	321	2	0
Target w. 2	376	917	1	5
Target w. 3	0	1	1078	1298
Target w. 4	1	4	987	1398
Etc.				

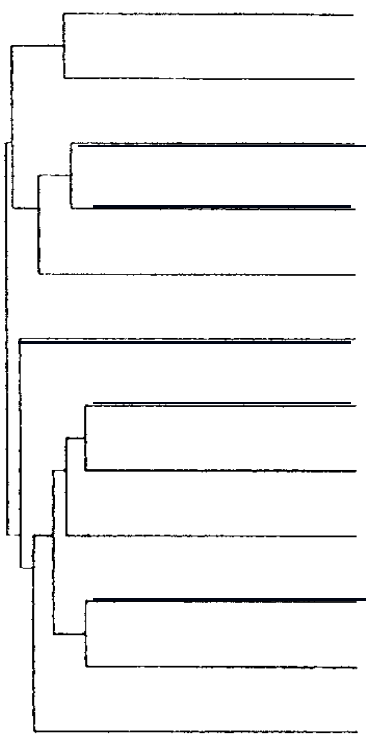
Distributional learning

	Context w. 1 (the __ of)	Context w. 2 (at the __ is)	Context w. 3 (has __ him)	Context w. 4 (He __ in)
Target w. 1	210	321	2	0
Target w. 2	376	917	1	5
Target w. 3	0	1	1078	1298
Target w. 4	1	4	987	1398
Etc.				

Context vectors:

- Target word 1 210-321-2-0
- Target word 2 376-917-1-5
- Target word 3 0-1-1078-1298
- Target word 4 1-4-987-1398

Cluster analysis



Pronouns, auxiliaries (49)
Question words, pronouns-auxiliaries (53)
Verb (105)
Verb (62)
Verb, present PTC (50)
Determiner, possessive pronoun (29)
Conjunction, interjection, proper noun (91)
Proper noun (91)
Preposition (33)
Noun (317)
Adjective (92)
Proper noun (10)

Dendogram

Distributional learning

The ambient language provides a wealth of information that would allow children to acquire grammatical categories based on distributional analysis.

Distributional learning

But are children able to detect and compute the distributional information that is available in the ambient language?

Distributional learning

Nonce words: tupiro
golabu
bidaku
padoti

Subjects: 8 months-old infants

Saffran et al. 1996

Distributional learning

tupiro – bidaku – padoti – bidaku – golabu …

Saffran et al. 1996

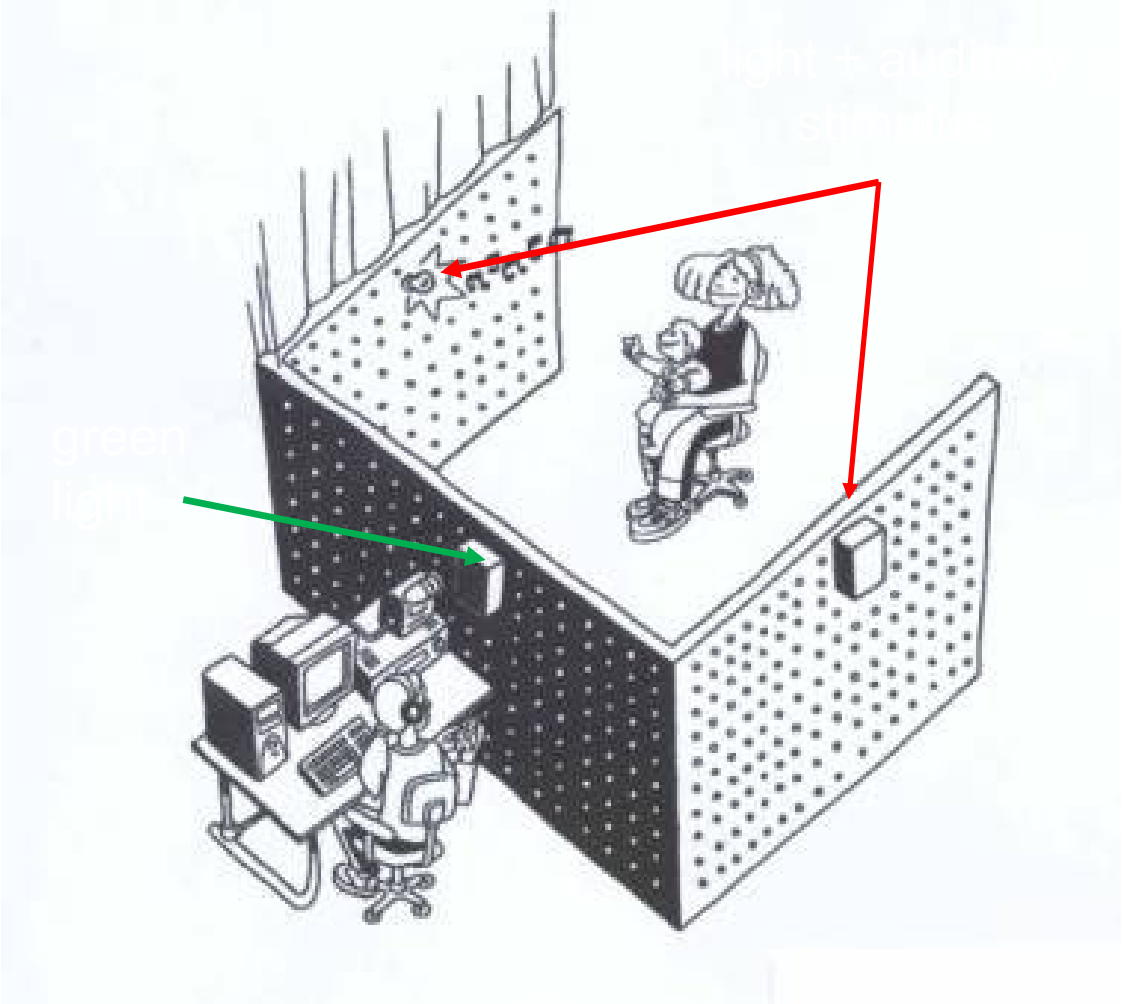
Distributional learning

Condition1: tupiro-bidaku-…

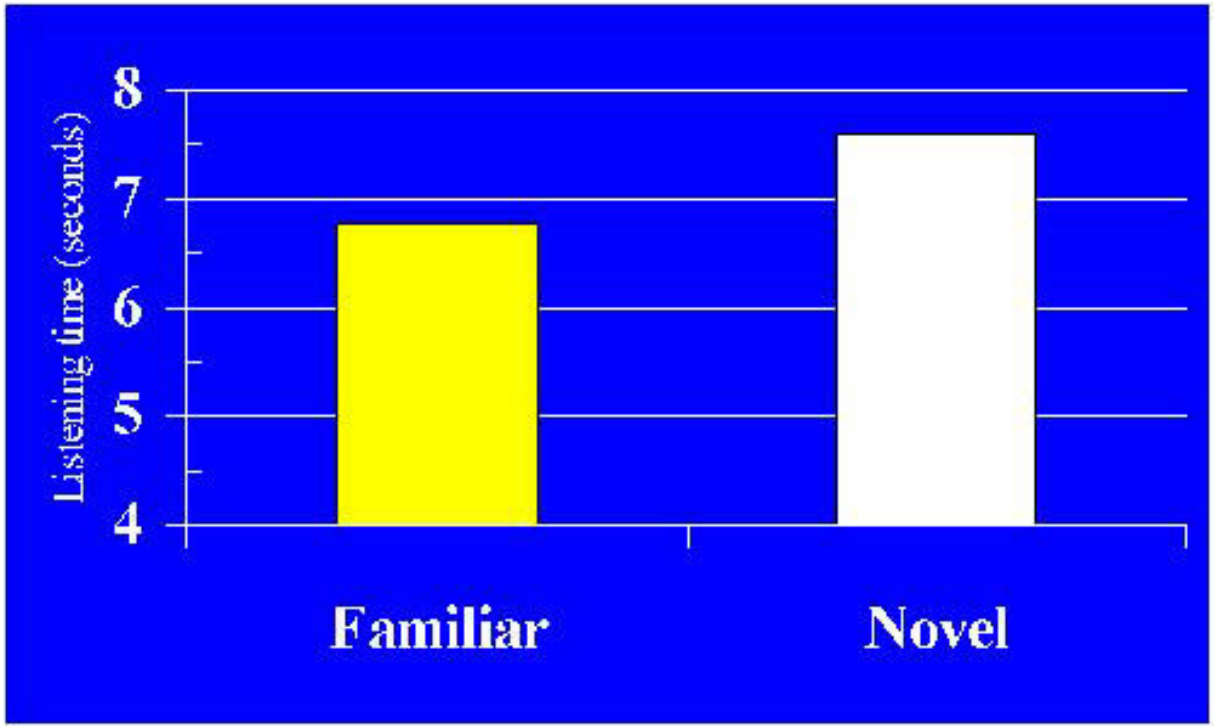
Condition 2: da-pi-ku-ro-tu-…

Saffran et al. 1996

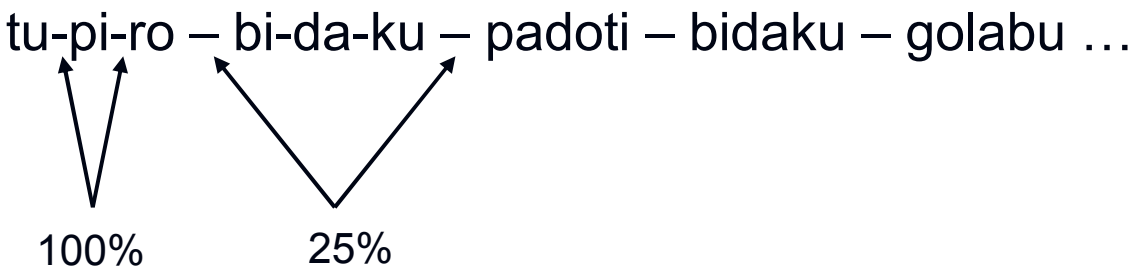
Head-turn procedure



Distributional learning



Distributional learning



transitional probabilities

Distributional learning

Condition 1: 100-100-25-100-100-25 …

Condition 2: 8.3-8.3-8.3-8.3-8.3 …

Distributional learning

… the existence of computational abilities that extract structure so rapidly suggests that it is premature to assert a priori how much of the striking knowledge base of human infants is primarily a result of experience-independent mechanisms. In particular, some aspects of early development may turn out to be best characterized as resulting from innately biased statistical leaning mechanisms rather than innate knowledge. If this is the case, then the massive amount of experience gathered by infants during the first postnatal year may play a far greater role in development than has previously been recognized.

[Saffran et al. 1996]

The rise of constructions

Early multiple-word utterances

More milk.	1;11
Cup get-it.	2;0
Spoon back.	2;0

Early multiple-word utterances

More car.	1;11
More that.	2;0
More cookie.	2;0
More fish.	2;1
More jump.	2;1
More Peter water.	2;4

Early multiple-word utterances

Block get-it.	2;3
Bottle get-it.	2;3
Spoon get-it.	2;4
Towel get-it.	2;4
Dog get-it.	2;4
Books get-it.	2;5

Early multiple-word utterances

Spoon back.	2;2
Tiger back.	2;3
Give back.	2;3
Ball back.	2;3
Want ball back.	2;4

Early multiple-word utterances

More car.
More that.
More cookie.
More fish.
More jump.

Block get-it.
Bottle get-it.
Spoon get-it.
Towel get-it.
Dog get-it.

Spoon back.
Tiger back.
Give back.
Ball back.
Want ball back.

More ___ .
___ get-it.
___ back.

Early multiple-word utterances

Children's early multi-word utterances are lexically specific constructions.

[Tomasello 2000]

Item-based constructions

No bed.	1;11
No bread.	2;0
No eat.	2;2
No milk.	2;2
No apple juice.	2;5

Item-based constructions

Clock on there.	2;2
Up on there.	2;2
Hot in there.	2;2
Milk in there.	2;4
Water in there	2;5

Item-based constructions

All broke.	2;0
All buttened.	2;3
All clean.	2;4
All done.	2;4
All gone milk.	2;2
All gone shoe.	2;2
All gone juice.	2;2
All gone bear.	2;3

Item-based constructions

Dat Daddy.	2;0
Dat’s Weezer.	2;0
Dat my chair.	2;1
Dat’s him.	2;1
Dat’s a paper too.	2;4
That’s too little for me.	2;9

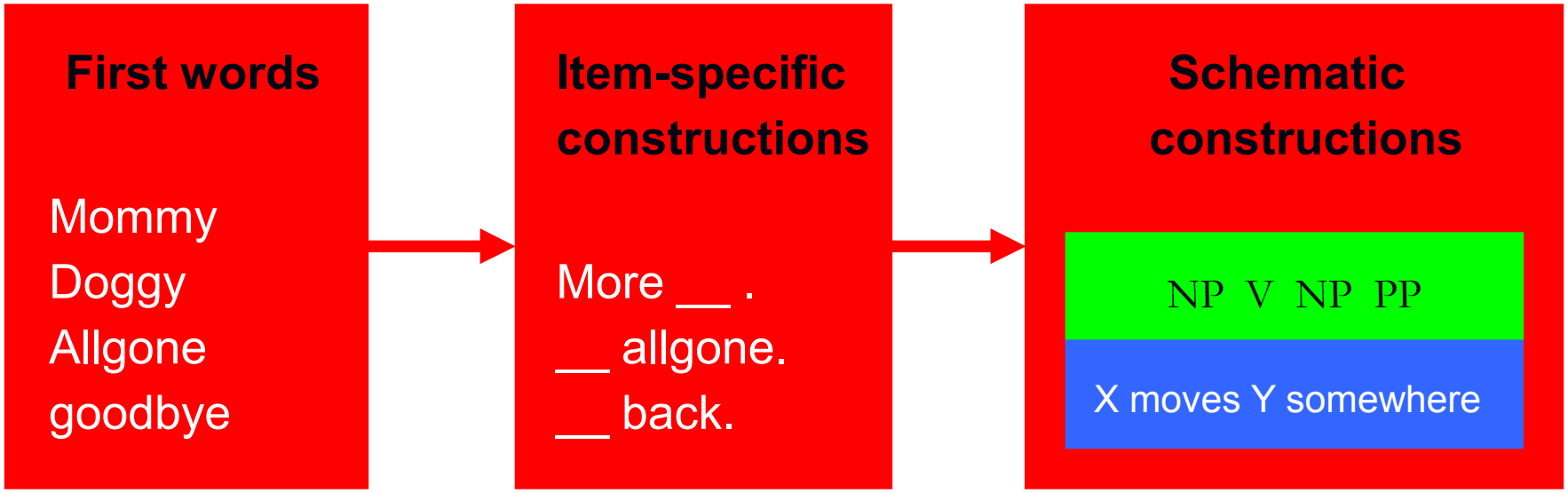
Item-based constructions

Boot off.	2;0
Light off.	2;1
Hands off.	2;1
Pants off.	2;1
Hat off.	2;3

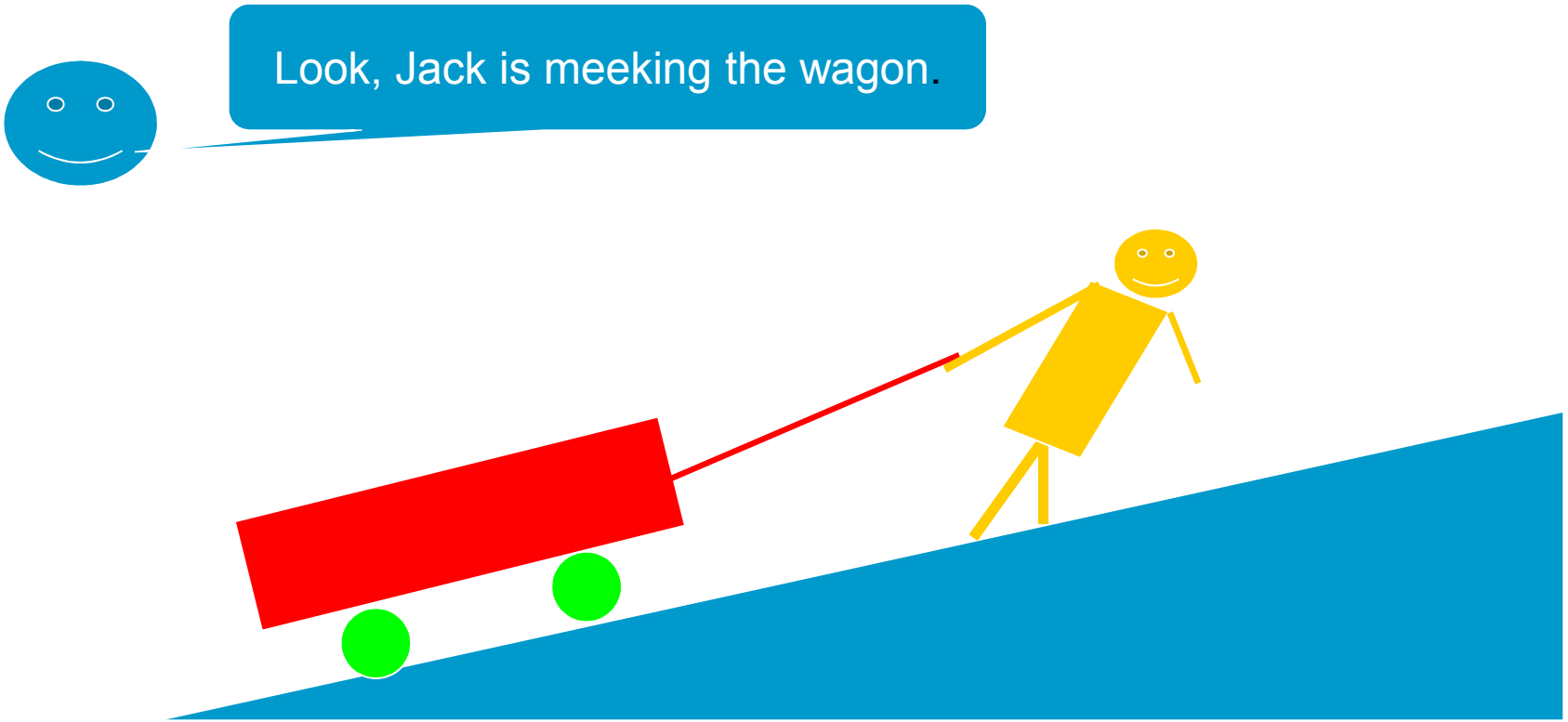
Item-based constructions

Item-specific constructions help to bridge the gap between rote learning and grammatical development.

Item-based constructions

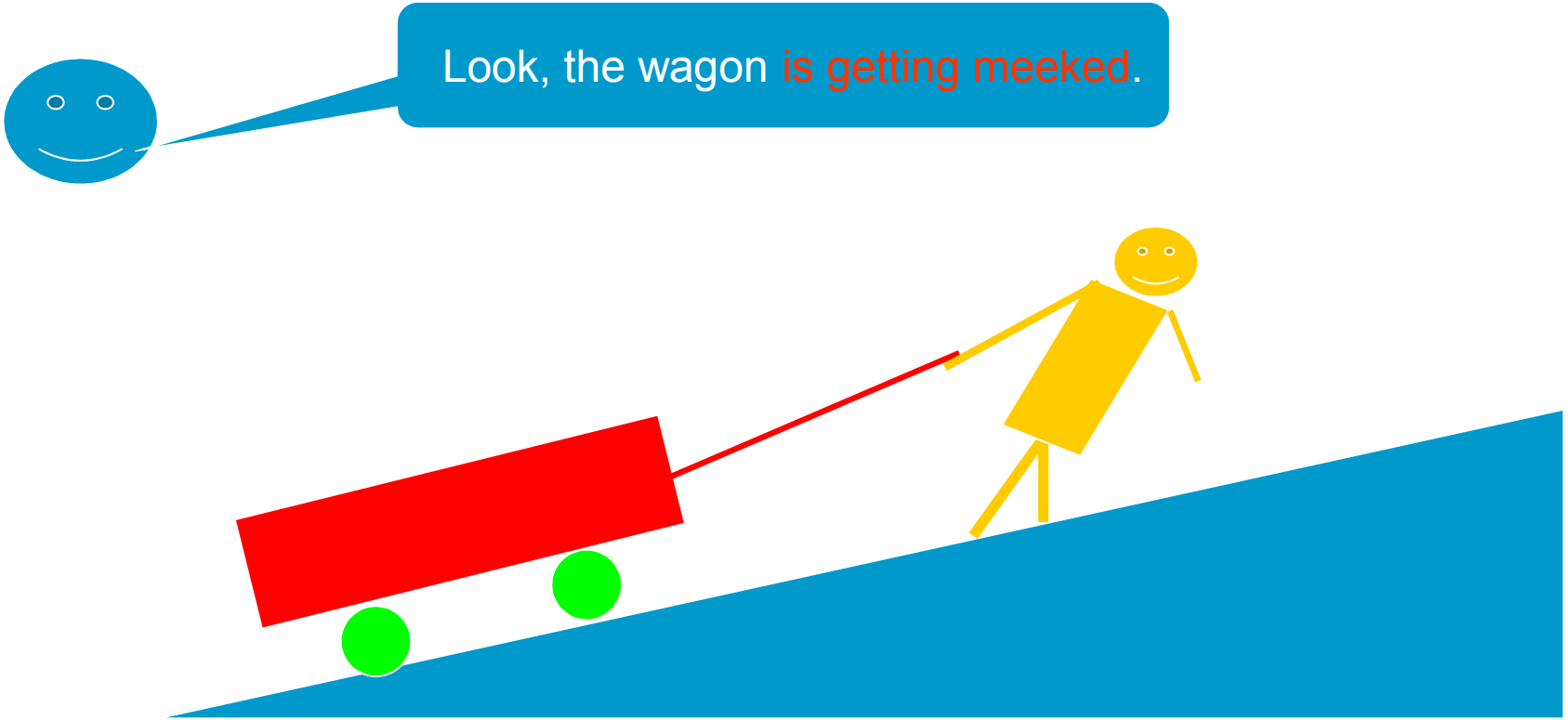


Brooks and Tomasello 1999

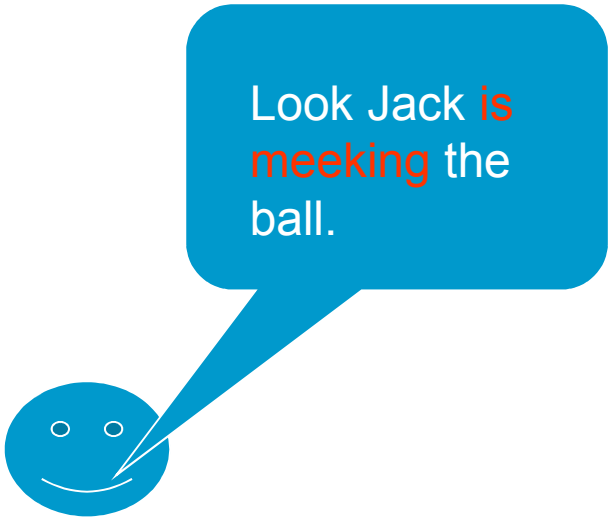


2;0-3;0 year olds

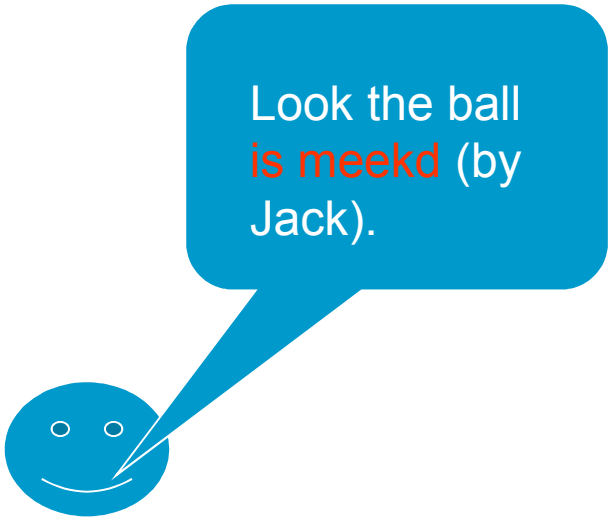
Brooks and Tomasello 1999



Brooks and Tomasello 1999



Brooks and Tomasello 1999



Brooks and Tomasello 1999

Passive condition

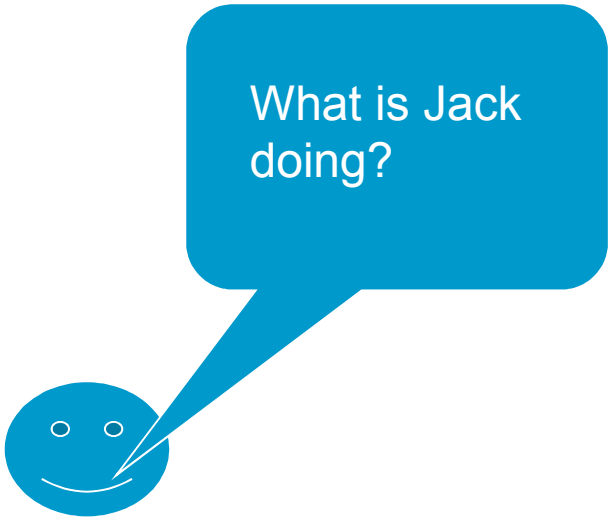
Look, the car is going to get meeked.
The car is going to get meeked by Big Bird.
What's going to get meeked? (experimenter points to the car)
That's right, the car is going to get meeked.
The car is going to get meeked by who? (eperimenter points to Big Bird)
Yes, the car is getting meeked by Big Bird. (while performing action)
Did you see what got meeked by Big Bird? (experimenter points to the car)
Exactly! The car got meeked by Big Bird.

Brooks and Tomasello 1999

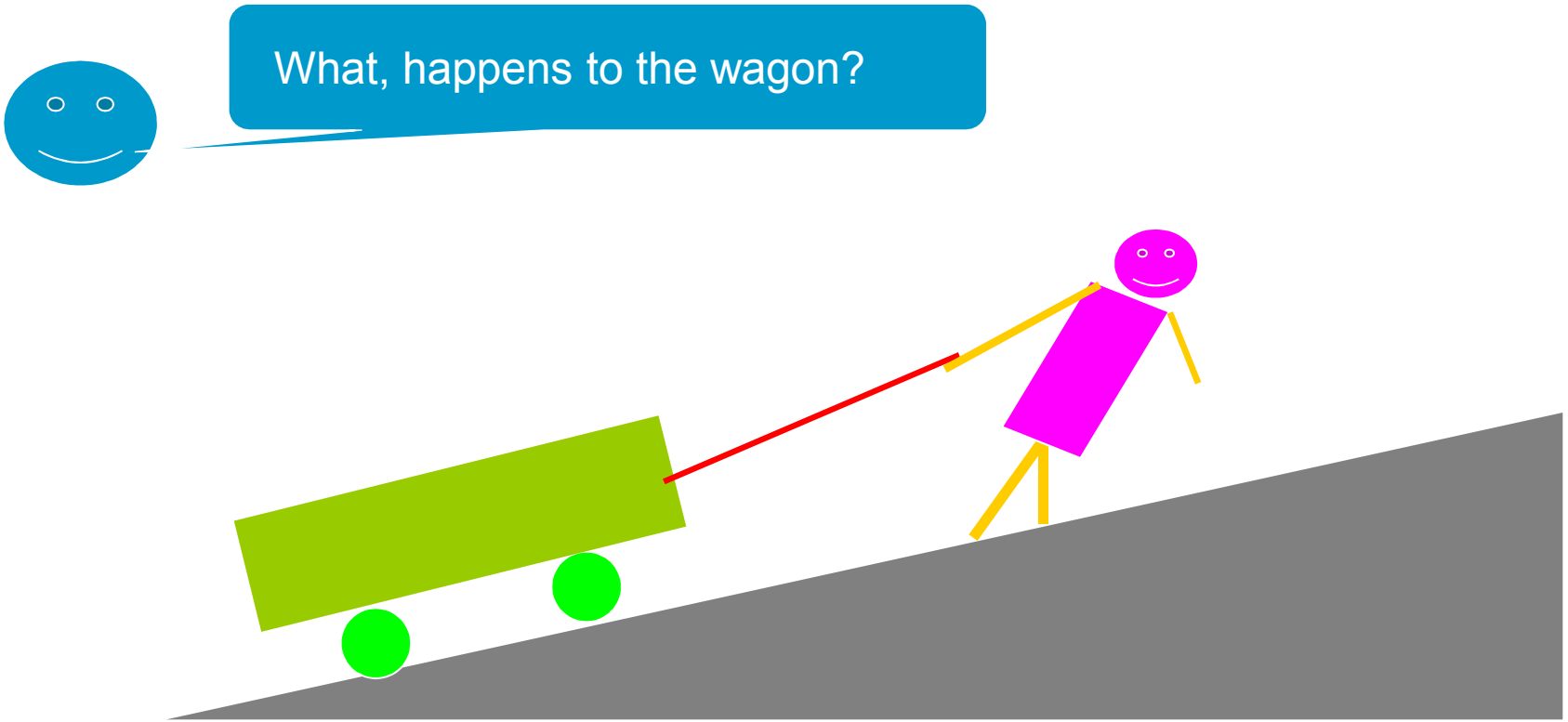
Active condition

Look, Big Bird is going to meek something.
Big Bird is going to meek the car.
Who's going to meek the car? (experimenter points to Big Bird)
That's right, Big Bird is going to meek the car.
Big Bird is going to meek what? (experimenter points to the car)
Yes, Big Bird is meeking the car. (while performing action)
Did you see who meeked the car? (experimenter points to Big Bird)
Exactly! Big Bird meeked the car.

Brooks and Tomasello 1999



Brooks and Tomasello 1999



Brooks and Tomasello 1999

	Passive training	
	Passive response	Active response
What happened to the PATIENT?		
What is the AGENT doing?		

Brooks and Tomasello 1999

	Passive training	
	Passive response	Active response
What happened to the PATIENT?	85	5
What is the AGENT doing?		

Brooks and Tomasello 1999

	Passive training	
	Passive response	Active response
What happened to the PATIENT?	85	5
What is the AGENT doing?	45	15

Brooks and Tomasello 1999

	Passive training		Active training	
	Passive response	Active response	Passive response	Active response
What happened to the PATIENT?	85	5		
What is the AGENT doing?	45	15		

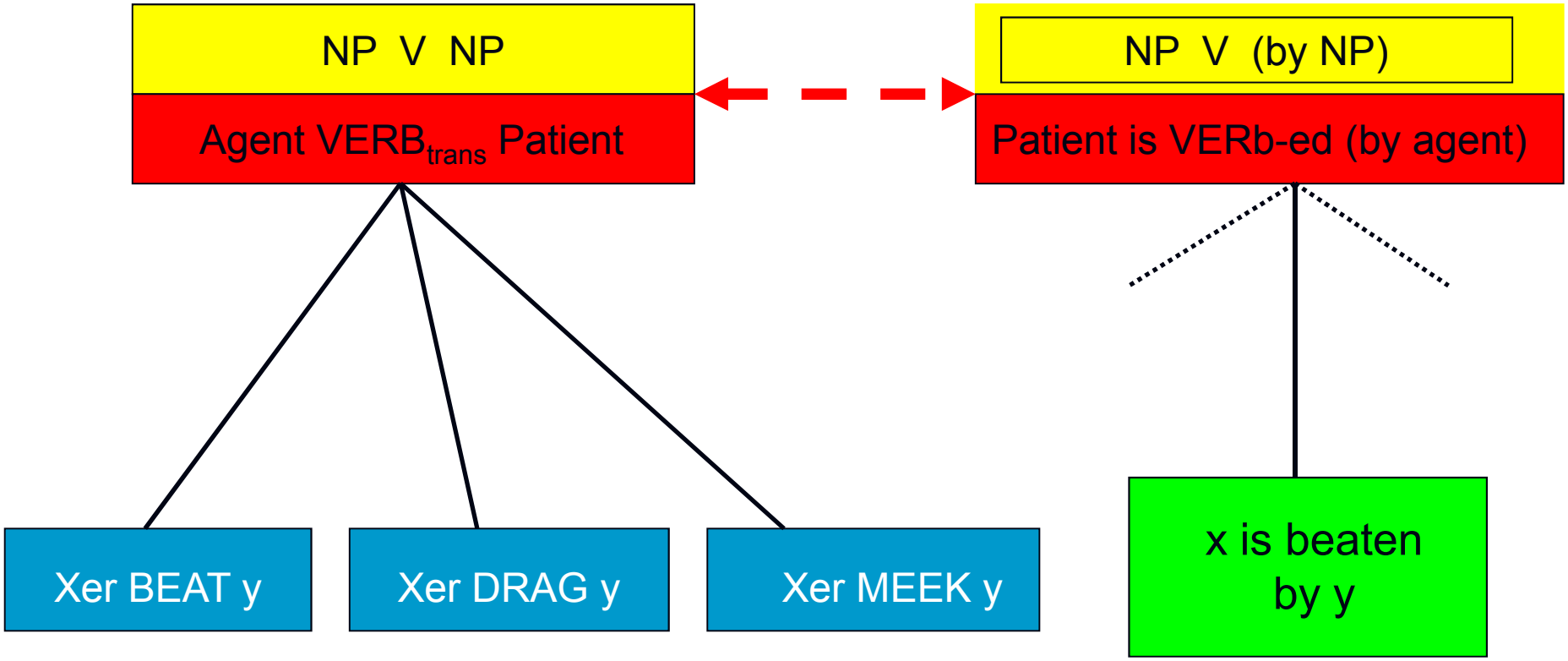
Brooks and Tomasello 1999

	Passive training		Active training	
	Passive response	Active response	Passive response	Active response
What happened to the PATIENT?	85	5	12	88
What is the AGENT doing?	45	15		

Brooks and Tomasello 1999

	Passive training		Active training	
	Passive response	Active response	Passive response	Active response
What happened to the PATIENT?	85	5	12	88
What is the AGENT doing?	45	15	0	100

Network of constructions



The rise of linguistic productivity

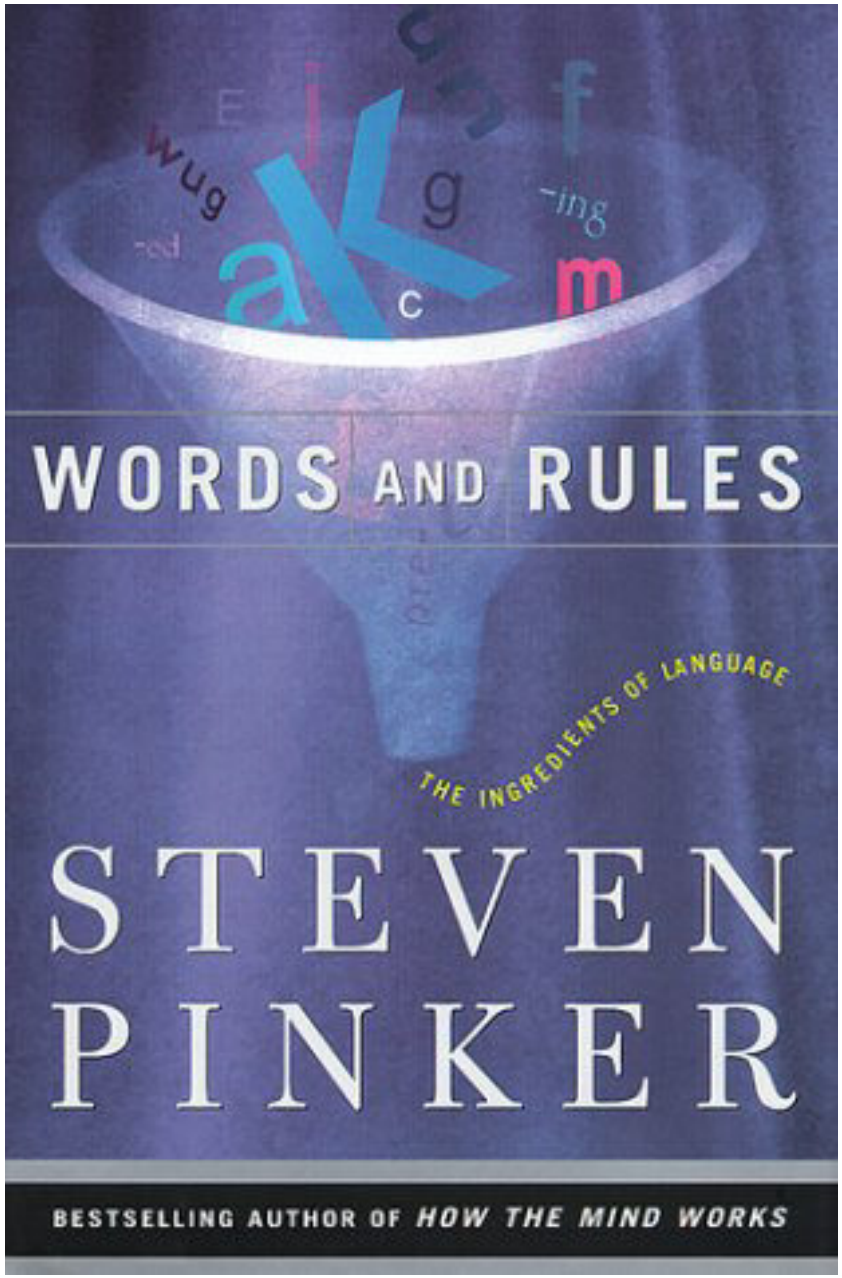
Linguistic productivity

Adult speakers are able to produce utterances they have never heard before.

What underlies the productive use of language?

Standard answer: Rules.

What is a linguistic rule?


WORDS AND RULES
THE INGREDIENTS OF LANGUAGE
STEVEN PINKER
BESTSELLING AUTHOR OF HOW THE MIND WORKS

Overgeneralization errors

buy	→	buyed
hit	→	hitted
bring	→	bringed
go	→	goed (wented)
foot	→	foots (feets)
child(ren)	→	childrens

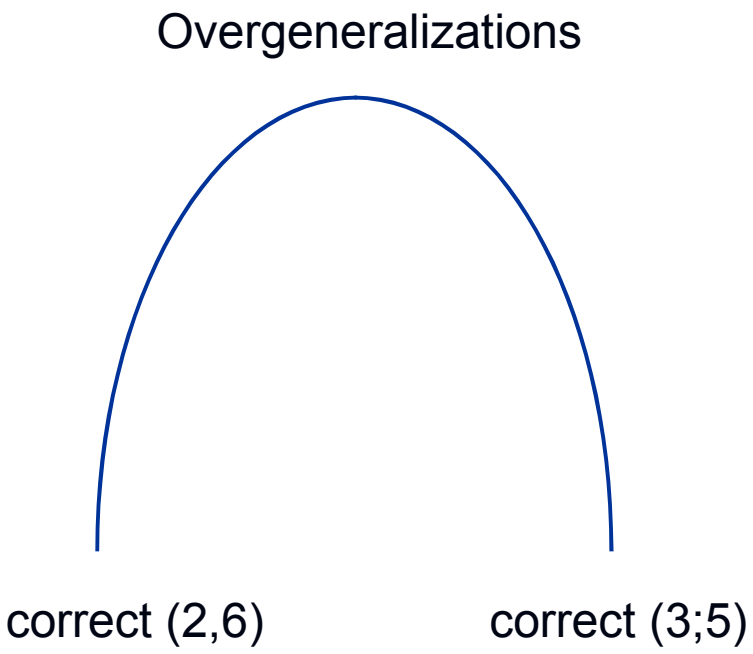
Overgeneralization errors

Children produce the correct inflected forms: *went, kissed*

Children overgeneralize the regular past tense form: *ringed, sayed*.
But only 5-30% of all irregular verbs are regularized. Great variability.

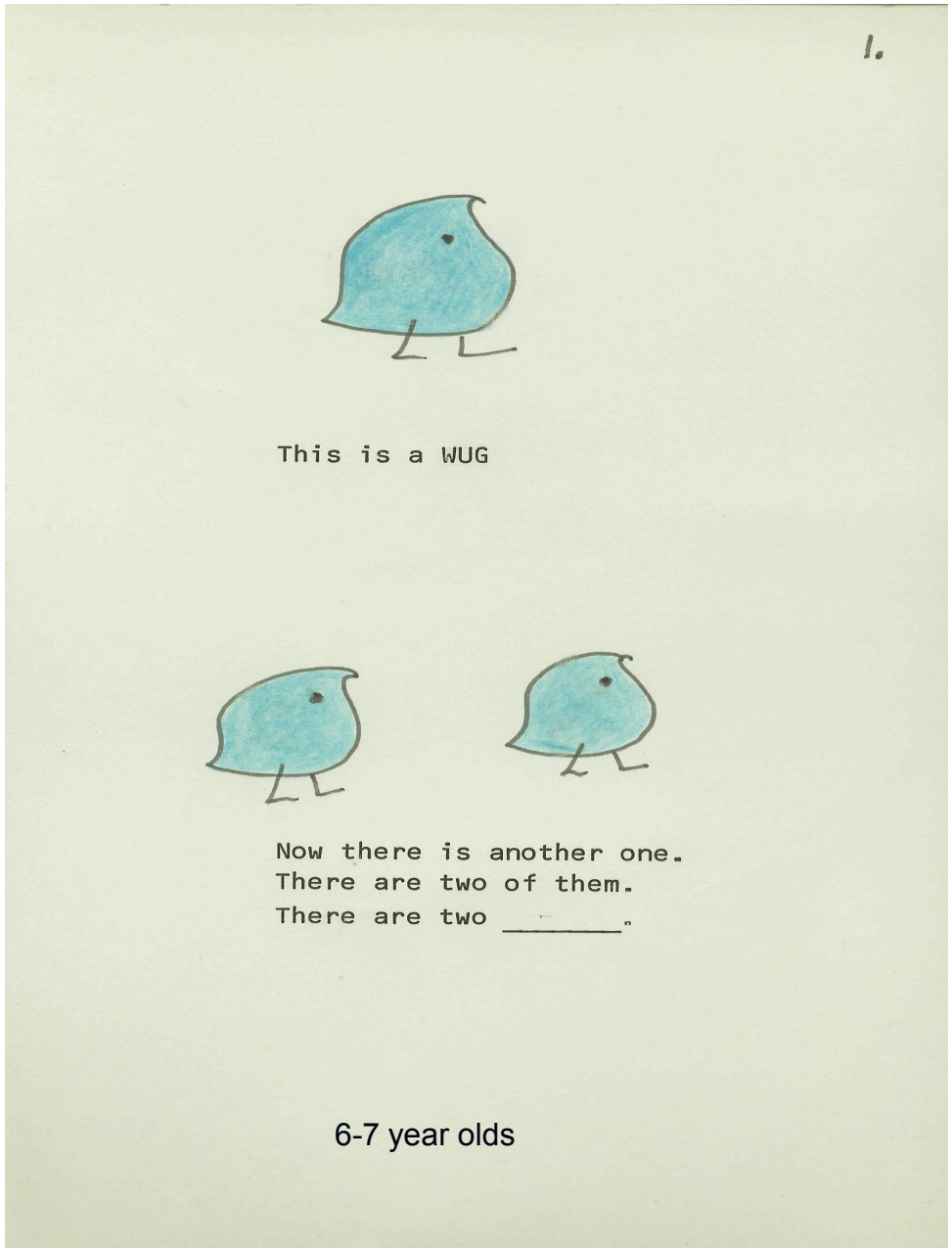
Children eliminate overextension errors.

U-shaped development



Berko (1958) The wug test

This is a wug.
Now there is another one.
There are two of them.
There are two __ .



6-7 year olds

Berko 1958

This is a man who knows how to rick.
He is ricking. He did the same thing yesterday.
What did he do yesterday?
Yesterday he __ .

Berko 1958

Allomorphs:

killed	[d]
kissed	[t]
melt	[əd]

Berko 1958

Verbs	Allophones	Addedd past tense suffix
binged	[d]	78%
glinged	[d]	77%
ricked	[t]	73%

Berko 1958

Verbs	Allophones	Addedd past tense suffix
binged	[d]	78%
glinged	[d]	77%
ricked	[t]	73%
motted	[əd]	33%
bodded	[əd]	31%

Berko 1958

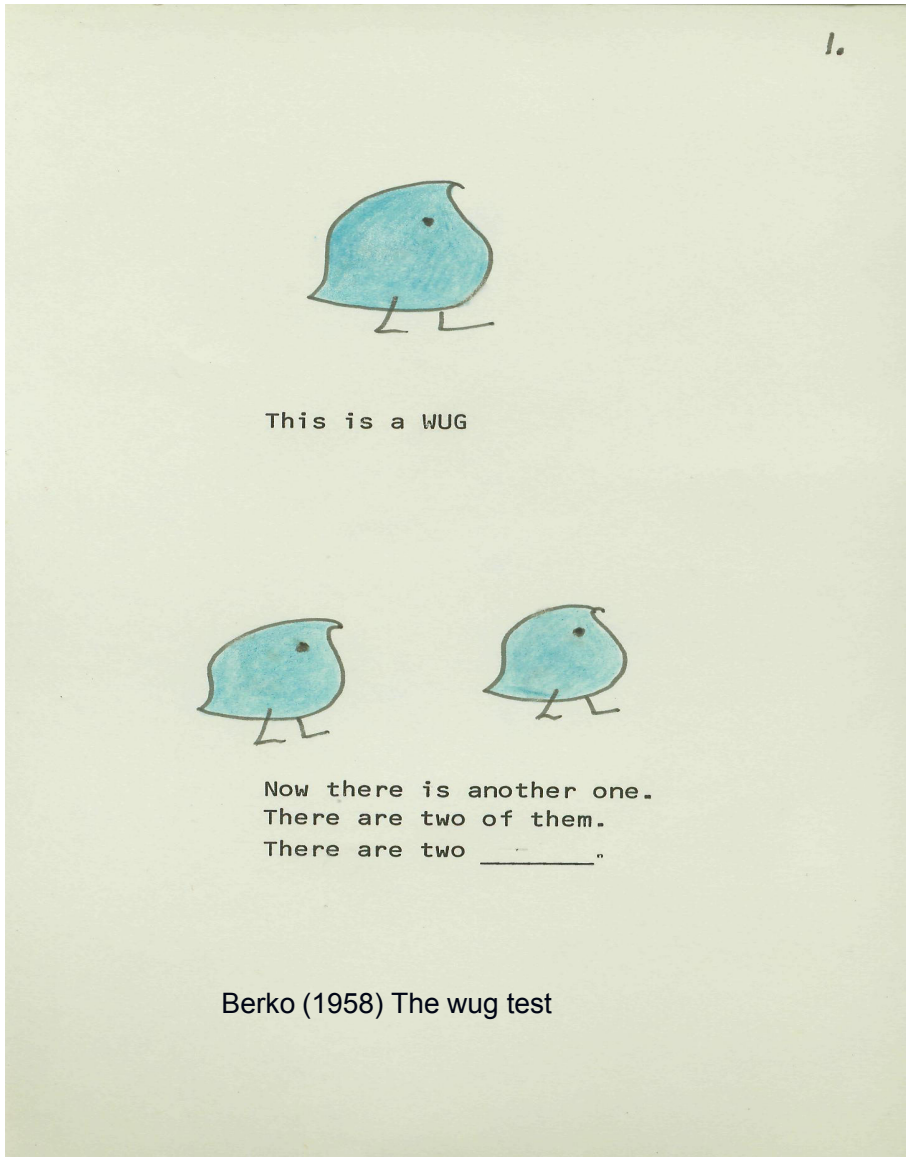
Verbs	Allophones	Addedd past tense suffix
binged	[d]	78%
glinged	[d]	77%
ricked	[t]	73%
motted	[əd]	33%
bodded	[əd]	31%
melted	[əd]	73%

Berko 1958

Verbs	Allophones	Addedd past tense suffix
binged	[d]	78%
glinged	[d]	77%
ricked	[t]	73%
motted	[əd]	33%
bodded	[əd]	31%
melted	[əd]	73%
ringed	[d]	16%

Berko 1958

- Performance is not consistent.
- Forms with [əd] cause more problems than forms with [t] and [d].
- Real English verb form (i.e. *melted, ring*) show a different pattern.



Berko (1958) The wug test

- Many children provided the ‘correct’ plural forms, but their responses were inconsistent.
- Similar inconsistencies have been observed in the production of past tense forms in naturally occurring discourse.

Berko 1958

What did the children learn?

V + [əd] = PAST

Bybee, Joan and Dan Slobin. 1982.
Rules and schemas in the development and use of the English past tense.
***Language* 58: 265-289**

Bybee and Slobin 1982

The overgeneralization rate is determined by two factors:

(1) Frequency
(2) Phonetic form (=similarity)

Frequency

Infrequent verbs were more often regularized than frequent ones.

Since frequent verbs are deeply entrenched in memory, they are less likely to change.

Similarity

Irregular verbs that are phonetically similar to regular verbs are less frequently regularized than irregular verbs that are phonetically different from regular verbs.

Bybee and Slobin 1982

Type	Example
Type 1	feel-felt
Type 2	find-found
Type 3	sing-sang

Bybee and Slobin 1982

Type	Example	Past through addition of [t/d]
Type 1	feel-felt	+
Type 2	find-found	
Type 3	sing-sang	

Bybee and Slobin 1982

Type	Example	Past through addition of [t/d]	Past ends in [t/d]
Type 1	feel-felt	+	+
Type 2	find-found		+
Type 3	sing-sang		

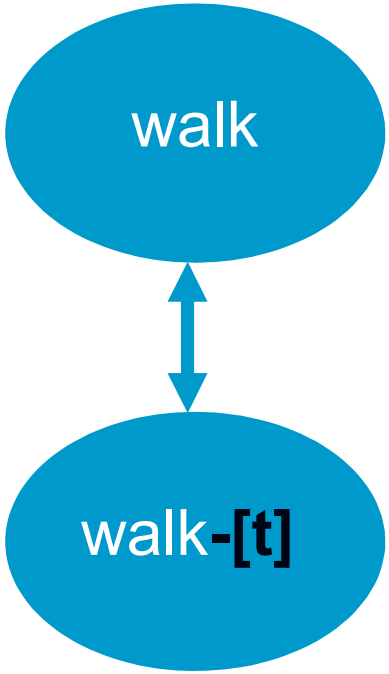
Bybee and Slobin 1982

Type	Example	Past through addition of [t/d]	Past ends in [t/d]	Regularization %
Type 1	feel-felt	+	+	11%
Type 2	find-found		+	40%
Type 3	fly-flew			77%

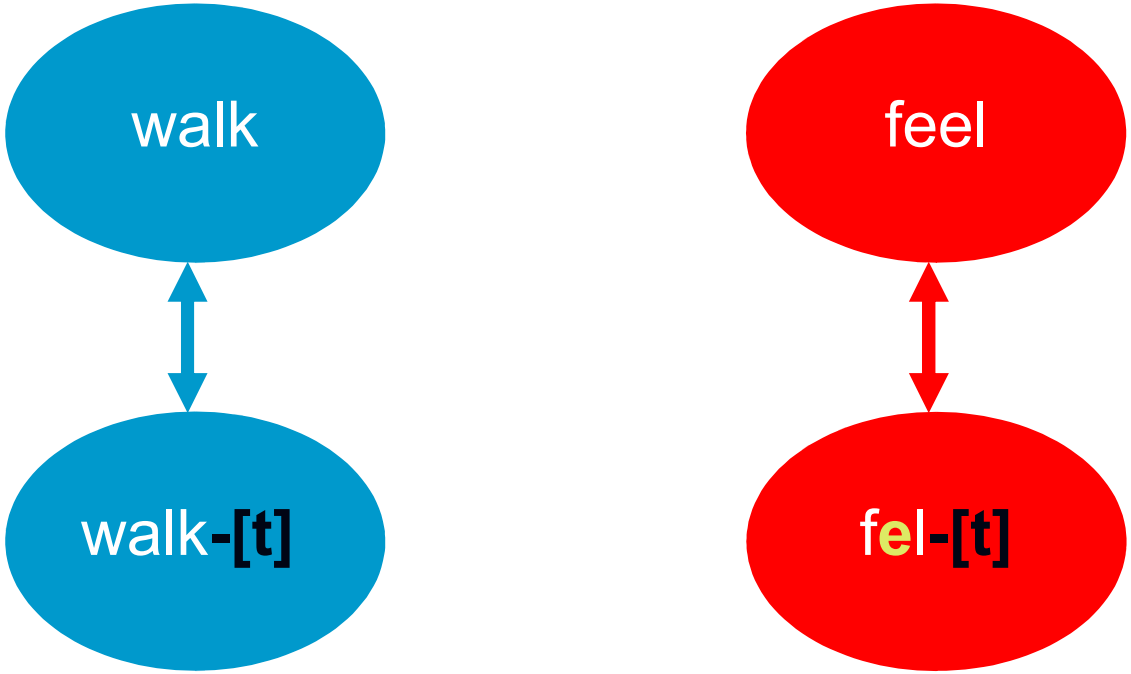
Bybee and Slobin 1982

Irregular verbs that are phonetically most distant from regular verbs are most likely to be regularized.

Bybee and Slobin 1982

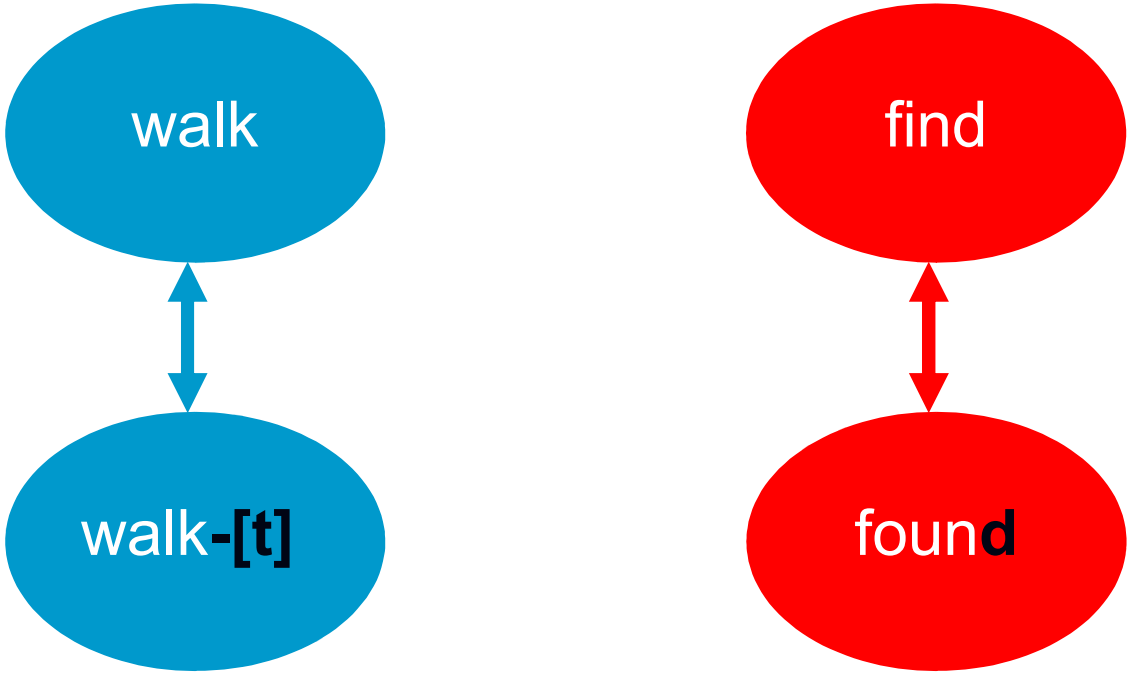


Bybee and Slobin 1982

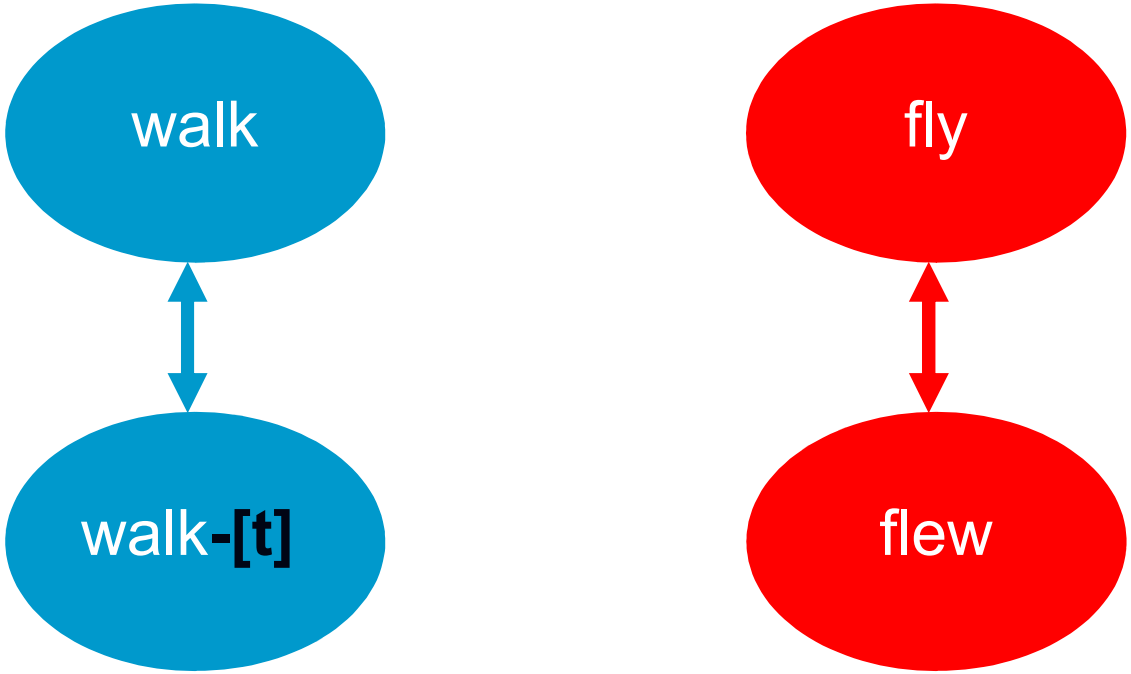


The pattern ‚feel-felt' is very similar to the pattern ‚walk-walked': infrequent regularization

Bybee and Slobin 1982



Bybee and Slobin 1982



The pattern ‚fly-flew' is very different from the pattern ‚walk-walked':
frequent regularization

Bybee, Joan and Carol L. Modor. 1983.
Morphological classes as natural categories.
***Language* 59: 251-270.**

Bybee and Modor 1983

/n/	spin	spun
/ŋ/	cling	clung
	fling	flung*
	sling	slung*
	sting	stung*
	string	strung*
	swing	swung
	wring	wrung
	hang	hung*
/ŋk/	slink	slunk
/k/	stick	stuck
	strike	struck*
/g/	dig	dug*

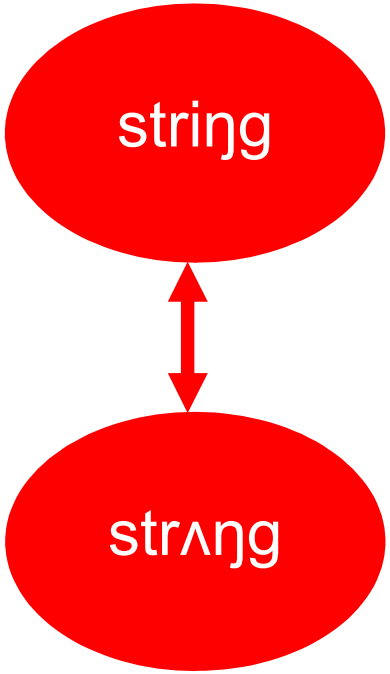
Bybee and Modor 1983

Subjects:	adult speakers
Items:	93 nonce words 16 real verbs
Technique:	Elicitation under time pressure

Bybee and Modor 1983

sking	skinged	skung
strin	strinned	strun
flink	flinked	flunk
streak	streaked	struck
meek	meeked	muck

Bybee and Modor 1983



Bybee and Modor 1983

- Initial consonant cluster
- Final consonant cluster

Bybee and Modor 1983

Initial consonants + [I] stem vowel

Initial consonants	Responses with /ʌ/
sCC stri	44% [= 56% regularized]

Bybee and Modor 1983

Initial consonants + [I] stem vowel

Initial consonants	Responses with /ʌ/
sCC stri sC sti	44% [= 56% regularized] 37% [= 63% regularized]

Bybee and Modor 1983

Initial consonants + [I] stem vowel

Initial consonants	Responses with /ʌ/
sCC stri sC sti CC fli	44% [= 56% regularized] 37% [= 63% regularized] 27% [= 73% regularized]

Bybee and Modor 1983

Initial consonants + [I] stem vowel

Initial consonants		Responses with /ʌ/
sCC	stri	44% [= 56% regularized]
sC	sti	37% [= 63% regularized]
CC	fli	27% [= 73% regularized]
C	ti	22% [= 78% regularized]

Bybee and Modor 1983

Final consonants + [I] stem vowel

Final consonants	Responses with /ʌ/
ŋ, ŋk	44% [= 56% regularized]

Bybee and Modor 1983

Final consonants + [I] stem vowel

Final consonants	Responses with /ʌ/
ŋ, ŋk k, g	44% [= 56% regularized] 25% [= 75% regularized]

Bybee and Modor 1983

Final consonants + [I] stem vowel

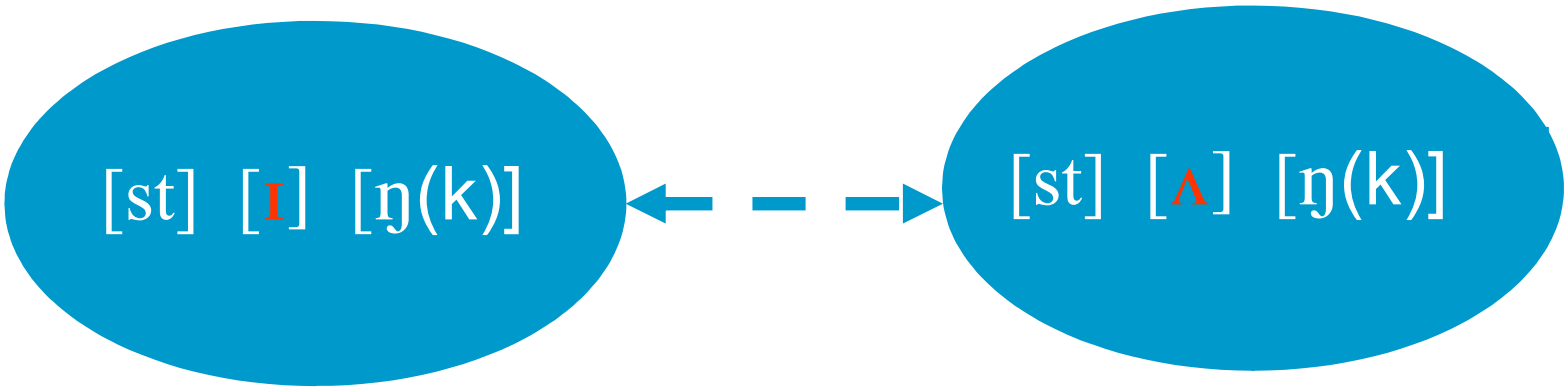
Final consonants	Responses with /ʌ/
ŋ, ŋk	44% [= 56% regularized]
k, g	25% [= 75% regularized]
n, m	21% [= 79% regularized]

Bybee and Modor 1983

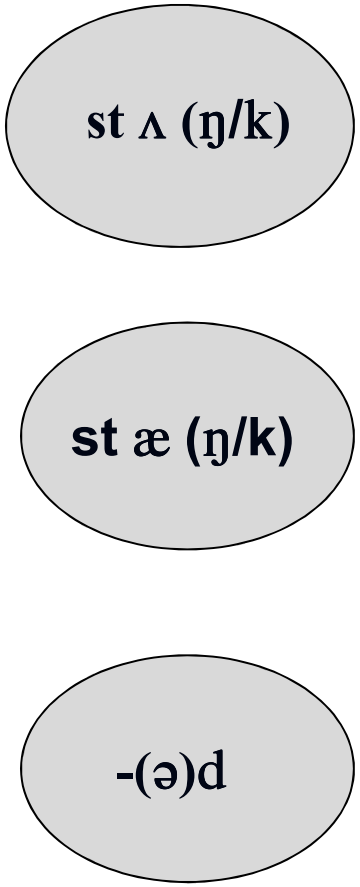
Final consonants + [I] stem vowel

Final consonants	Responses with /ʌ/
ŋ, ŋk	44% [= 56% regularized]
k, g	25% [= 75% regularized]
n, m	21% [= 79% regularized]
C	4% [= 96% regularized]

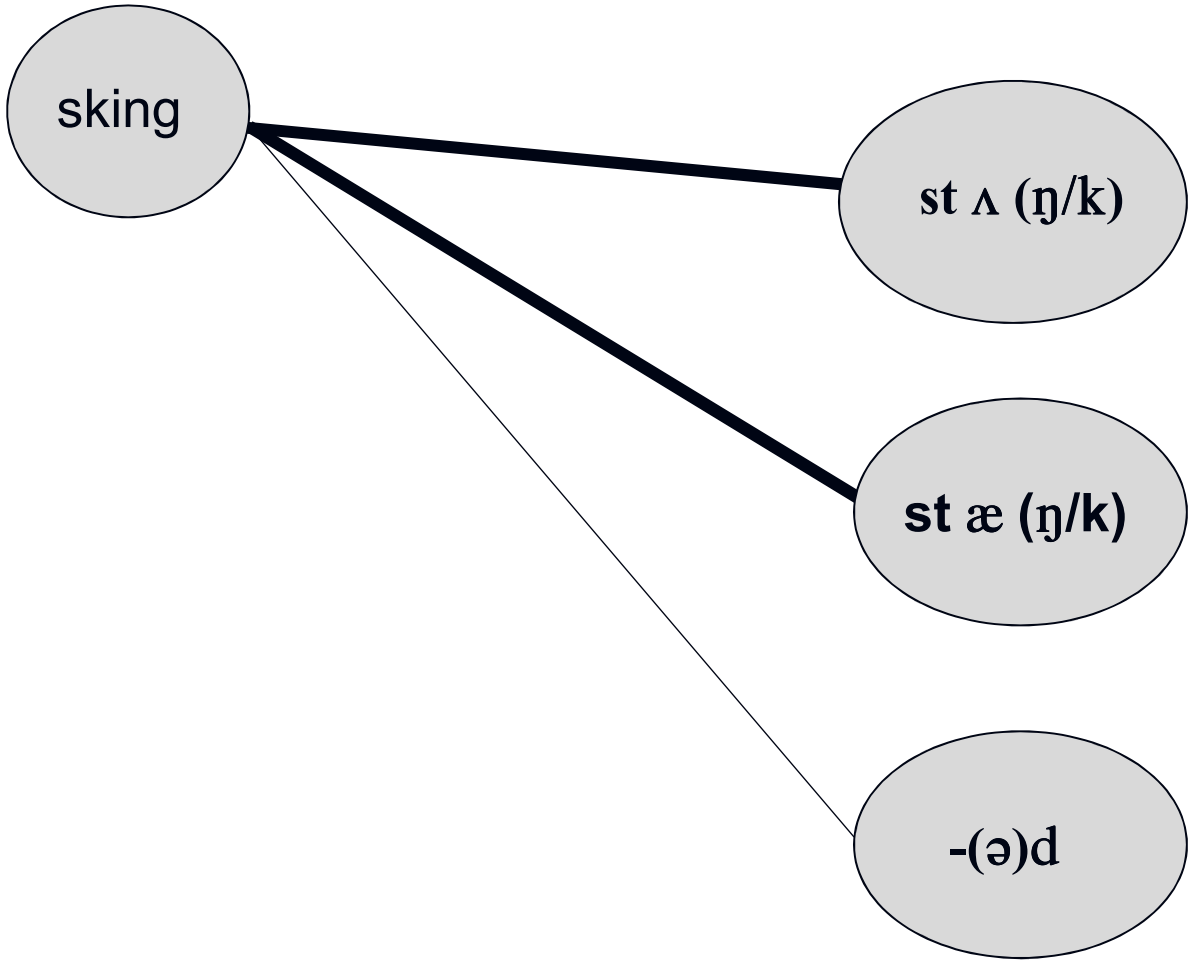
Bybee and Modor 1983



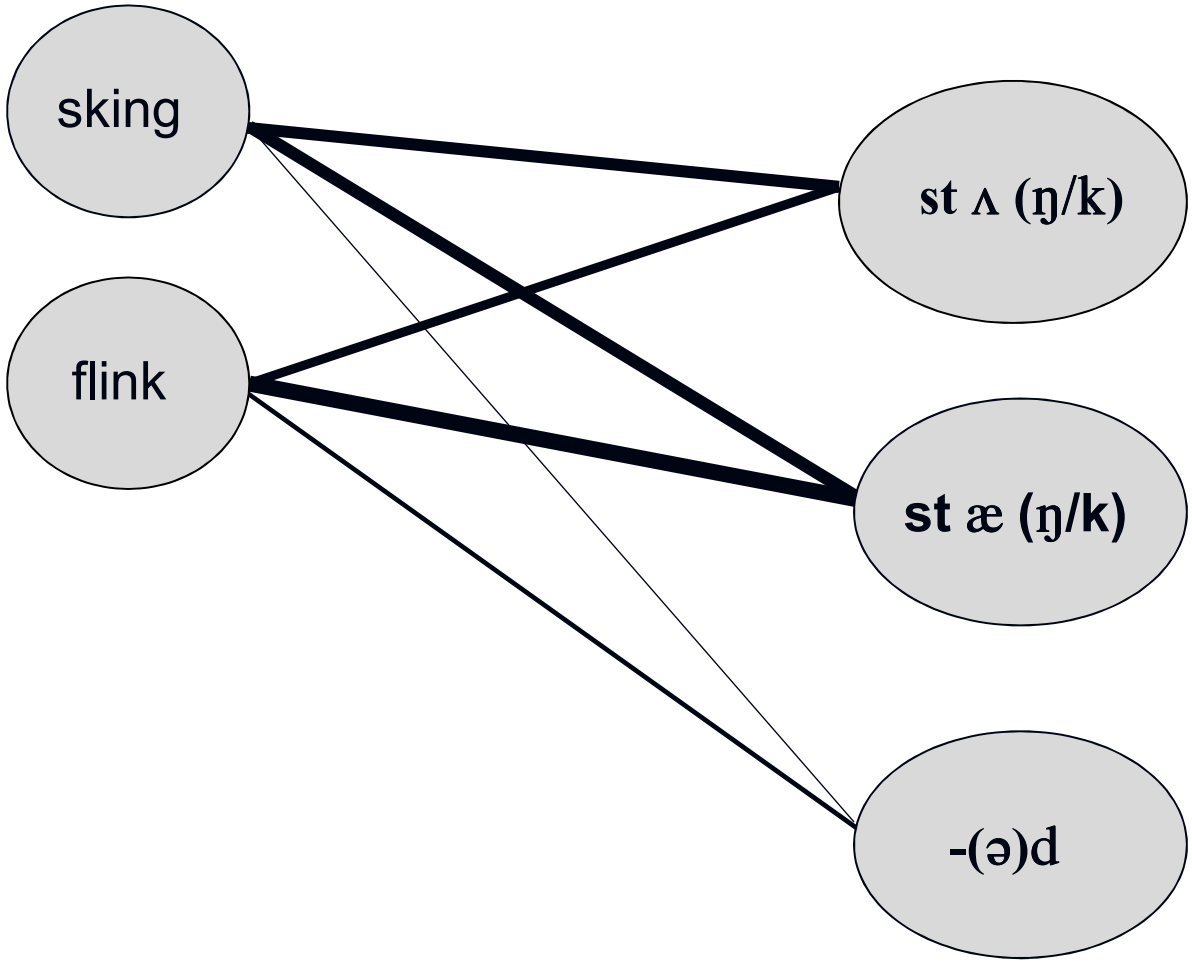
Bybee and Modor 1983



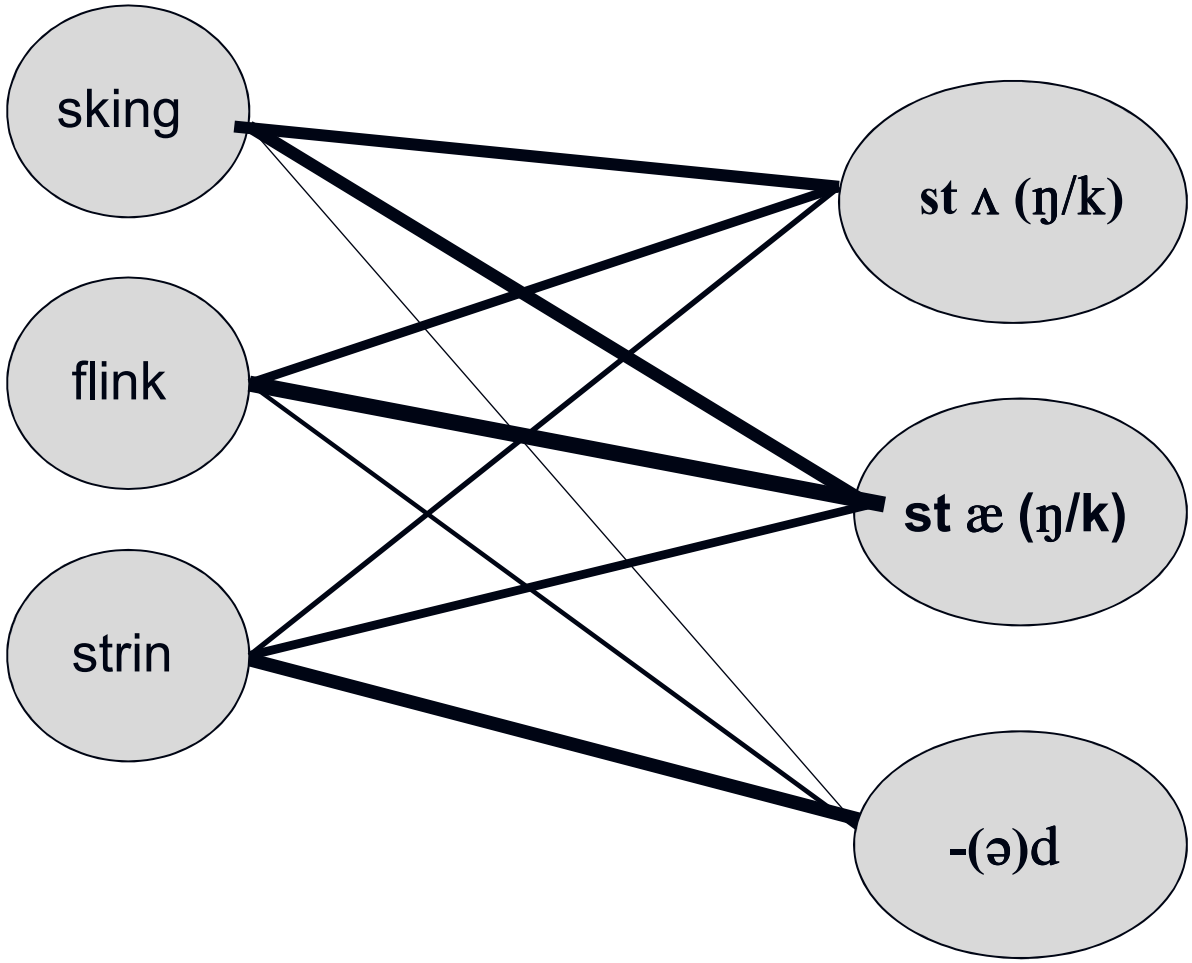
Bybee and Modor 1983



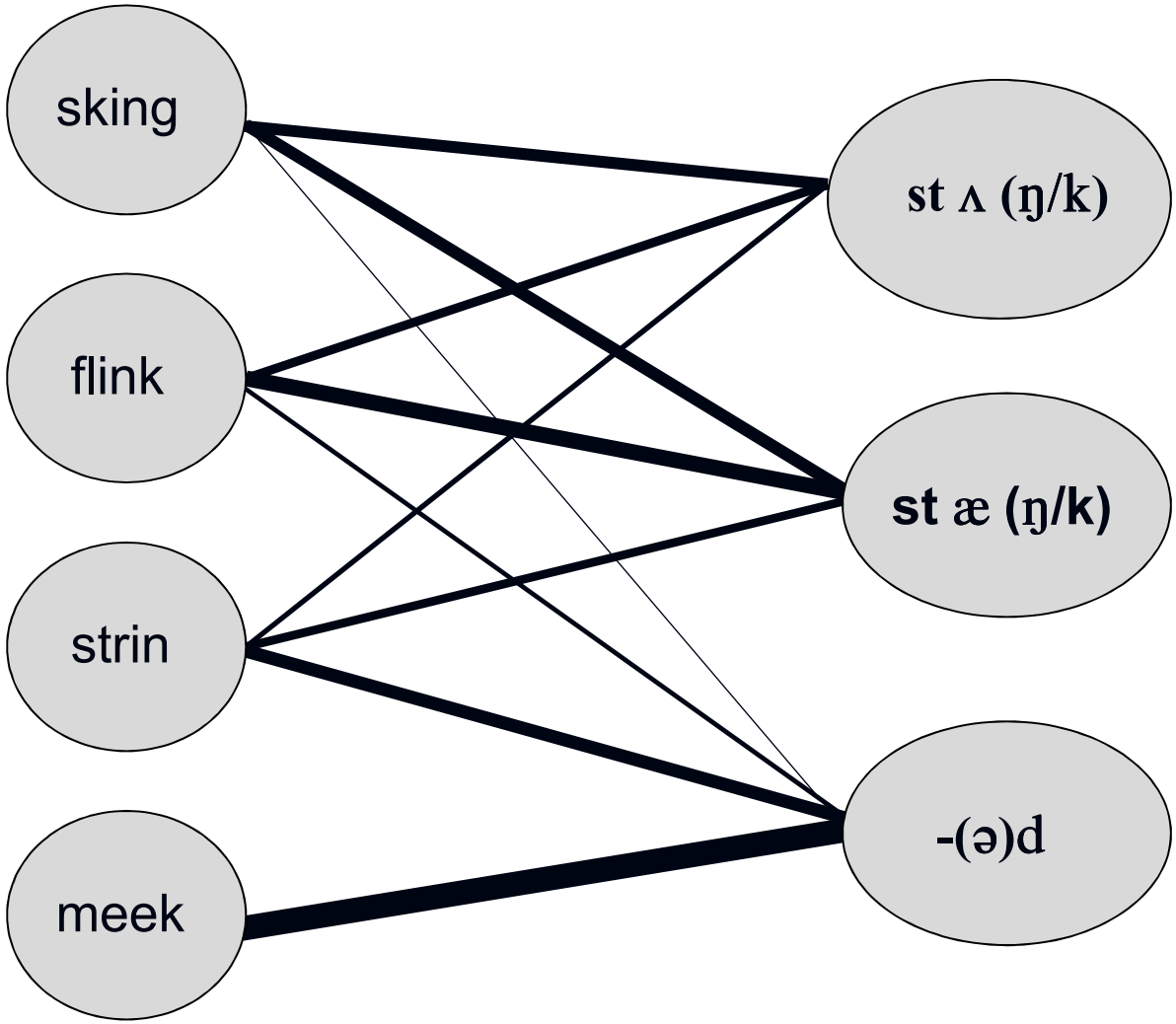
Bybee and Modor 1983



Bybee and Modor 1983



Bybee and Modor 1983



Bybee and Modor 1983

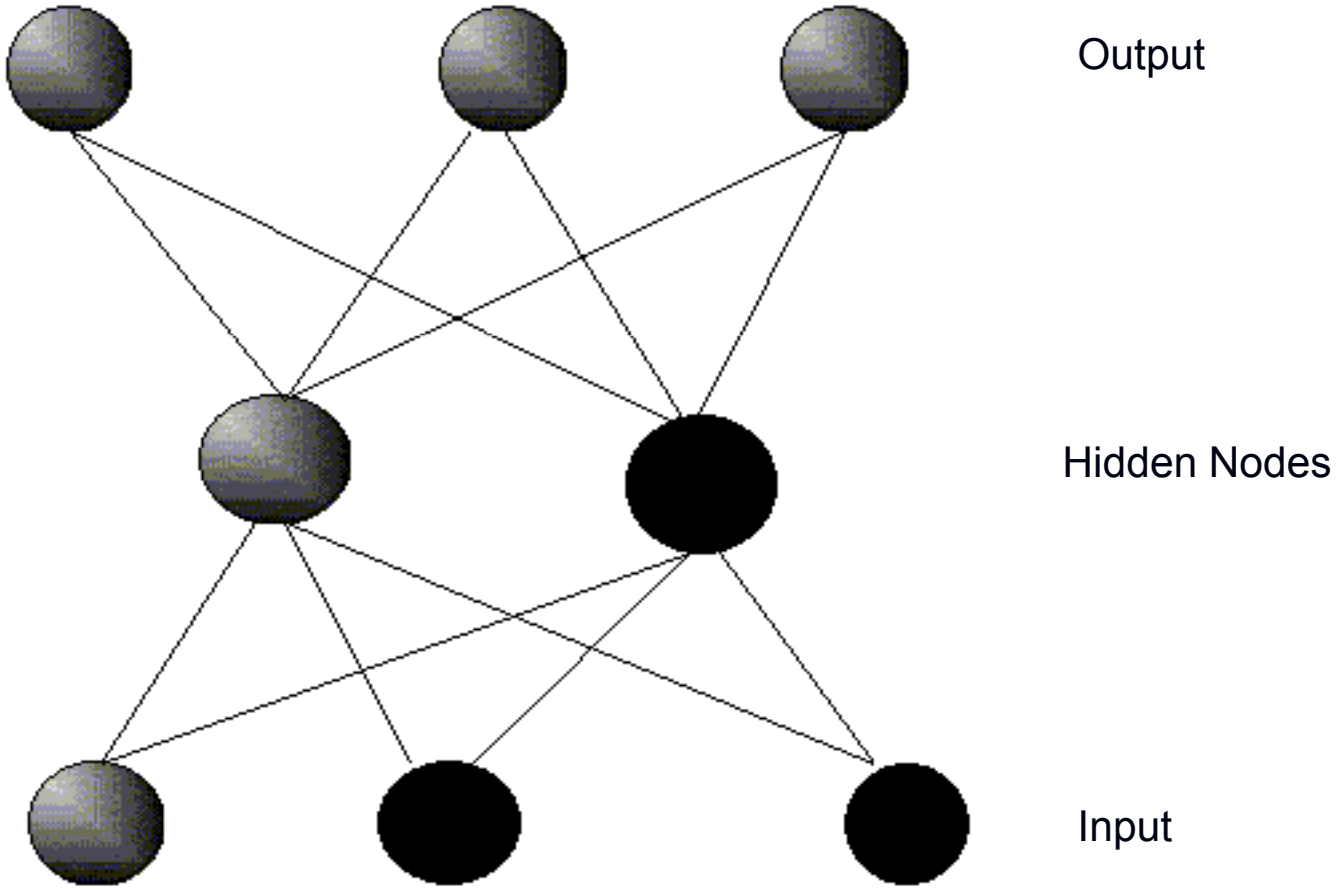
"Membership in morphological classes is not a matter of strict presence or absence of features, but rather of similarity to a **prototype**, which may be defined on a number of features." (Bybee and Modor 1983: 263)

Connectionism

Rumelhart, D.E. and J.L. McClelland. 1986. On learning the past tense of English verbs.

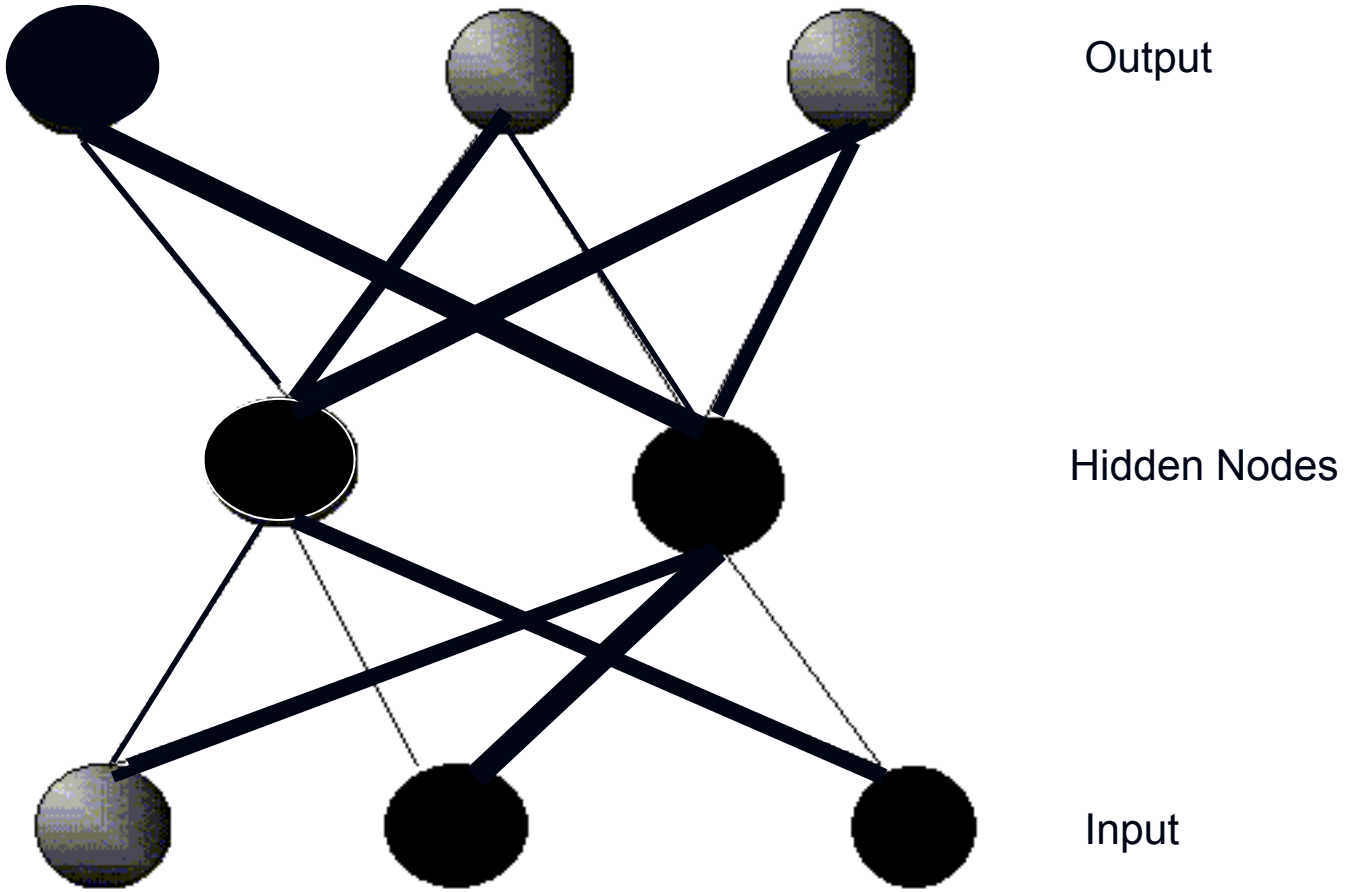
In David E. Rumelhart and James L. McClelland (eds.), *Parallel Distributed Processing. Explanation in Micro-structures of Cognition*, Vol. II, 216-271.

Connectionism



Connectionism

Connectionism



Connectionism

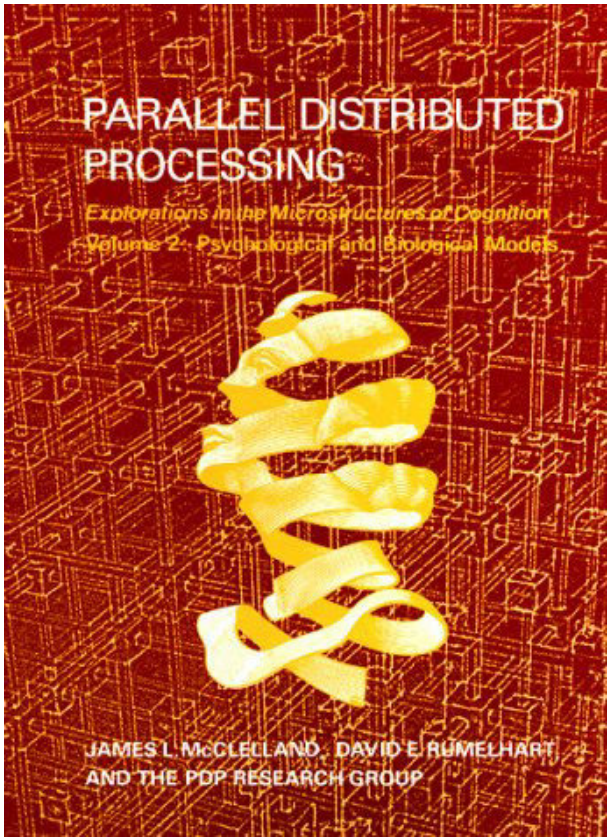
Connectionists models have become a ‘metaphor’ (model) for the human mind.

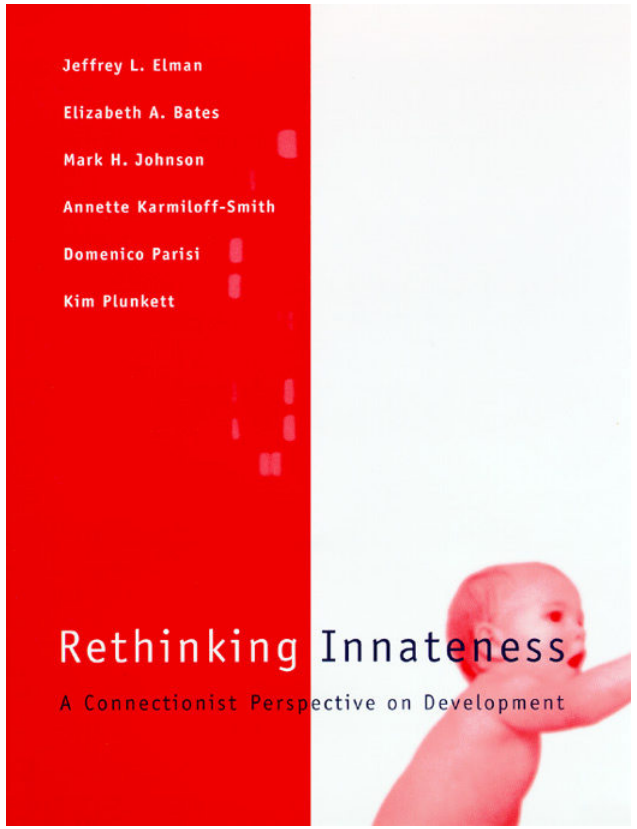
Connectionism

If the human mind works like the digital computer
linguistic categories would have clear-cut boundaries, and
linguistic productivity would be based on (mathematical) rules.

But if the human mind works like a connectionist network linguistic categories would have fuzzy boundaries, and linguistic productivity would be based on associations (or analogy).

Connectionism





Wordwise: CogLing

Ungerer & Schmid. 2006. Chapters 1-2
Murphy. 2004. Chapters 1-3
Diessel. forthcoming

Questions

- Children's early multi-word utterances have a particular form that child language researchers have characterized as 'item-specific constructions' (Tomasello) or 'pivot schemas' (Braine). Please explain.
- The acquisition of the English past tense takes a path that child language researchers have characterizes as 'U-shaped development'. Please explain.
- One of the best-known experiments of child language research is the so-called 'wug test'. What does this test show?