

Abstraction in language production

LING 611 Spring 2021

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2/14/2021

Abstraction in sound

- Phonemes as abstraction over phones (categorical perception).

Abstraction in syntax

- Syntactic category as abstraction over a class of words.
- Phrase structure as abstraction over a sequence of classes of words.

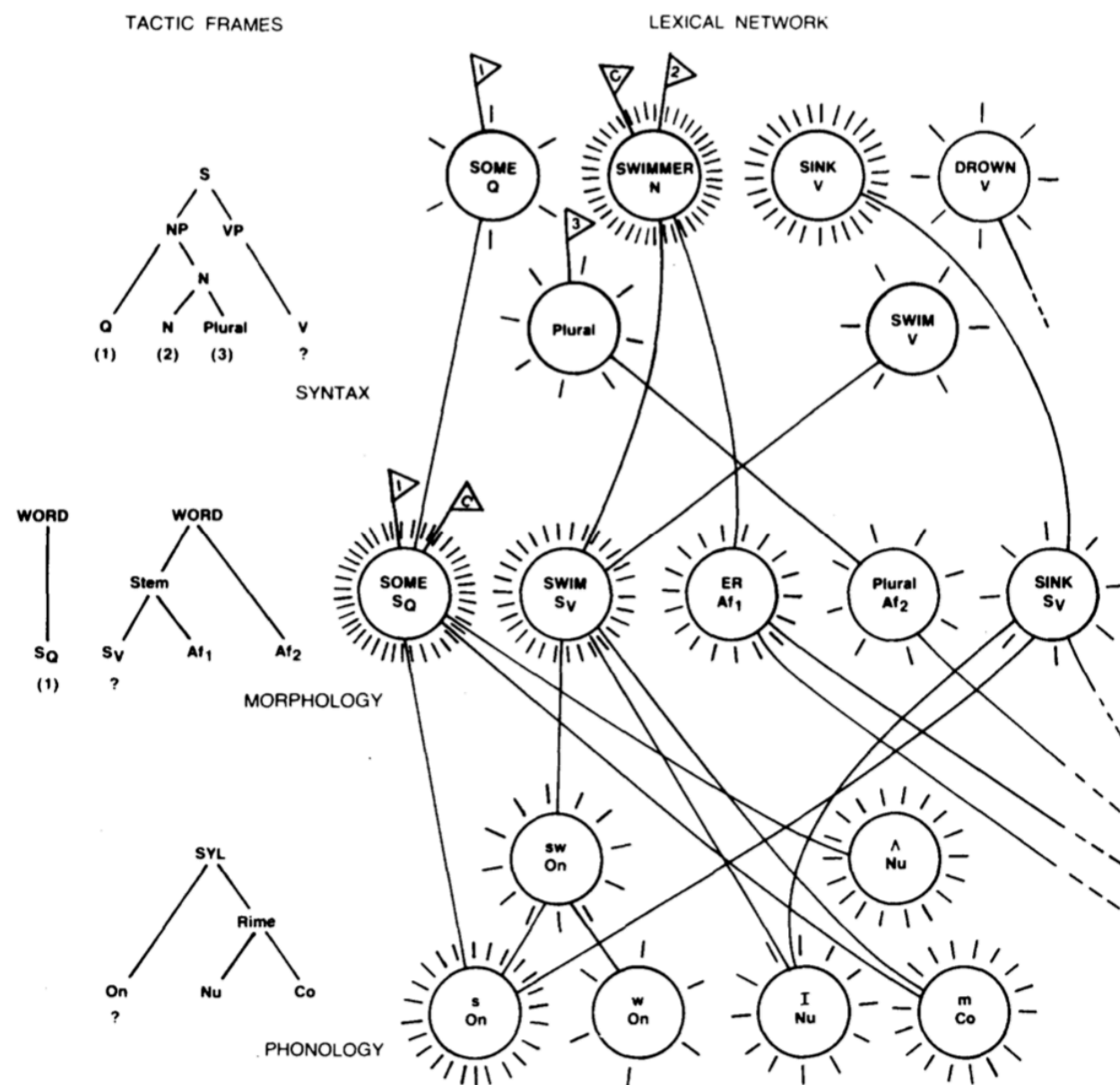
Abstraction in syntax

“Syntax is not inherent in the words employed or in the idea to be expressed. It is a generalized pattern imposed upon the specific acts as they occur (Lashley, 1951, p.120)”



Karl Lashley

Abstraction in syntax



Dell (1986)

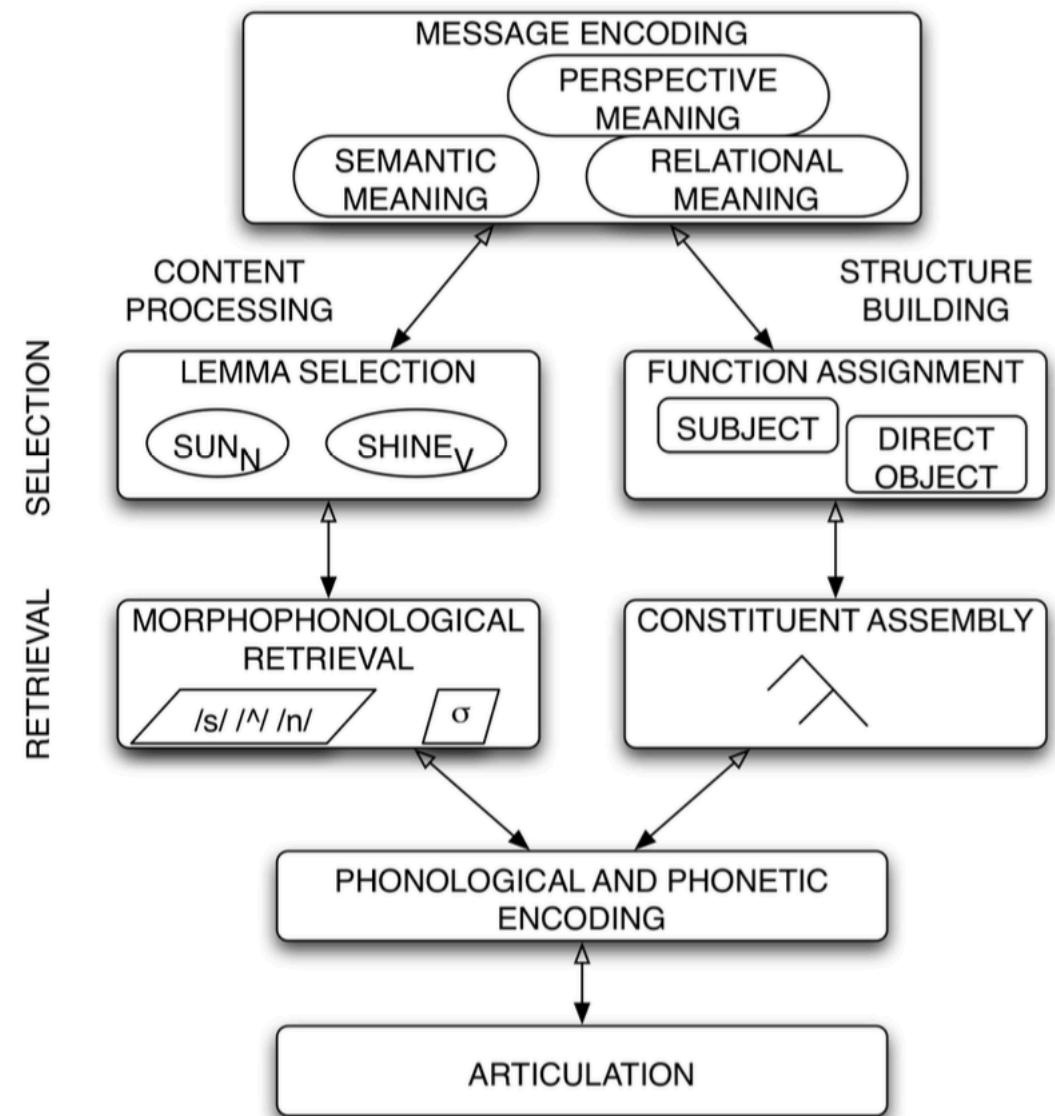


Figure 1. Schematic of consensus model of grammatical encoding. Filled arrowheads mark direction of primary information flow, open arrowheads mark possible feedback information flow.

Ferreira et al. (2019)

Accommodation in speech errors

Agreement accommodation

“That is true of most cities” -> “Most cities are true of that”

“That is too good for you” -> “You are too good for that”

Case accommodation

“She offends his sense of how the world should be” -> “

He offends her sense of how the world should be”

Stemberger (1985)

Garrett (1980)

Syntactic category constraint

Nouns exchange/substitute with nouns, verbs exchange/substitute with verbs, etc.

Intended: The dog chases the frisbee.

Possible errors: the frisbee chases the dog.

Unlikely errors: The chases dog the frisbee.

Intended: The dog is barking.

Possible errors: The cat is barking.

Unlikely errors: The woof is barking.

Syntactic priming - demo

Read aloud

My dad bought me a guitar!

Describe



What did you say?

Read aloud

My mom sent me a letter!

Describe



What did you say?

Double object (DO) dative



The man is giving the girl
the present



The man is handing the
clown the hat

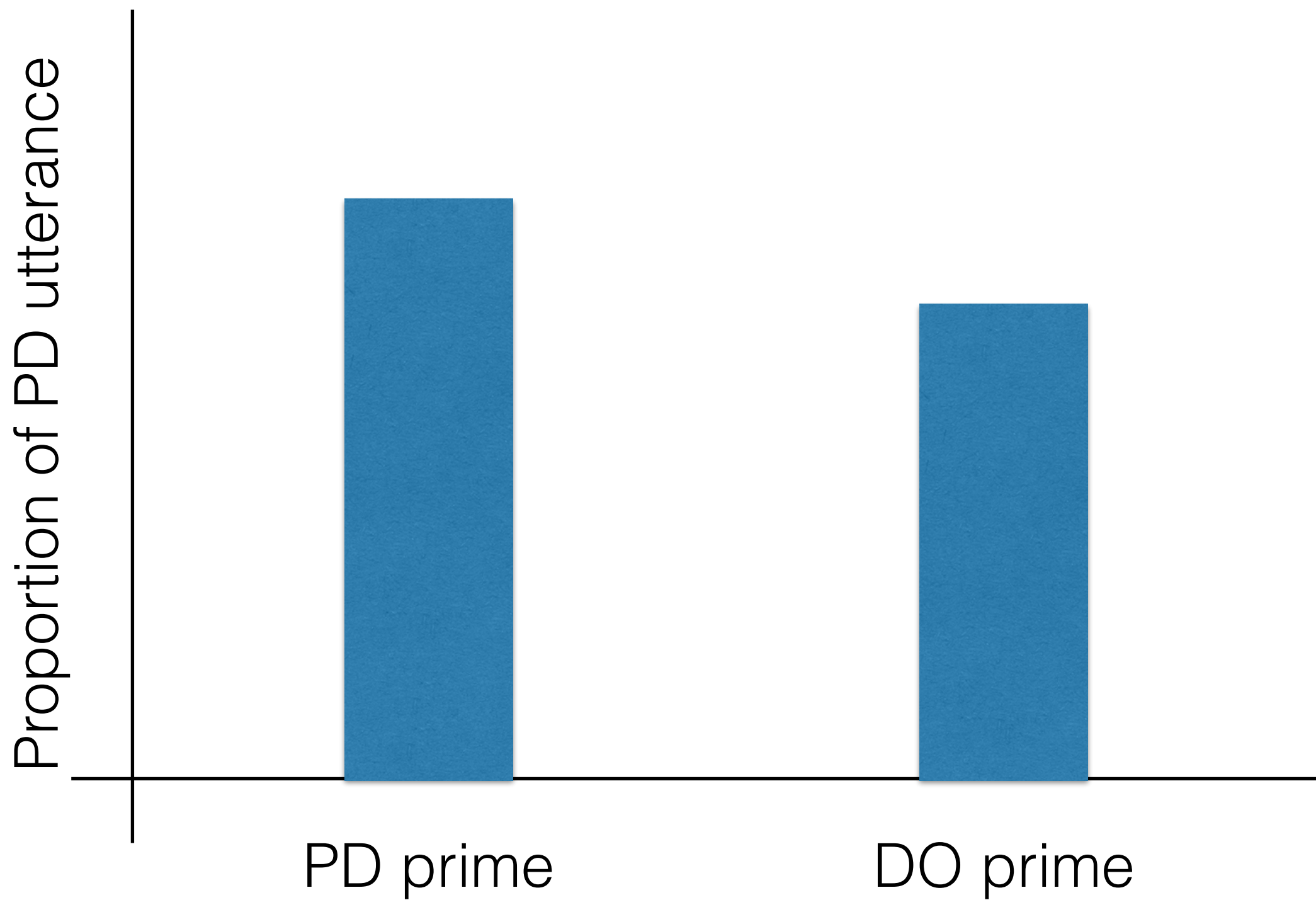
Prepositional dative (PD)

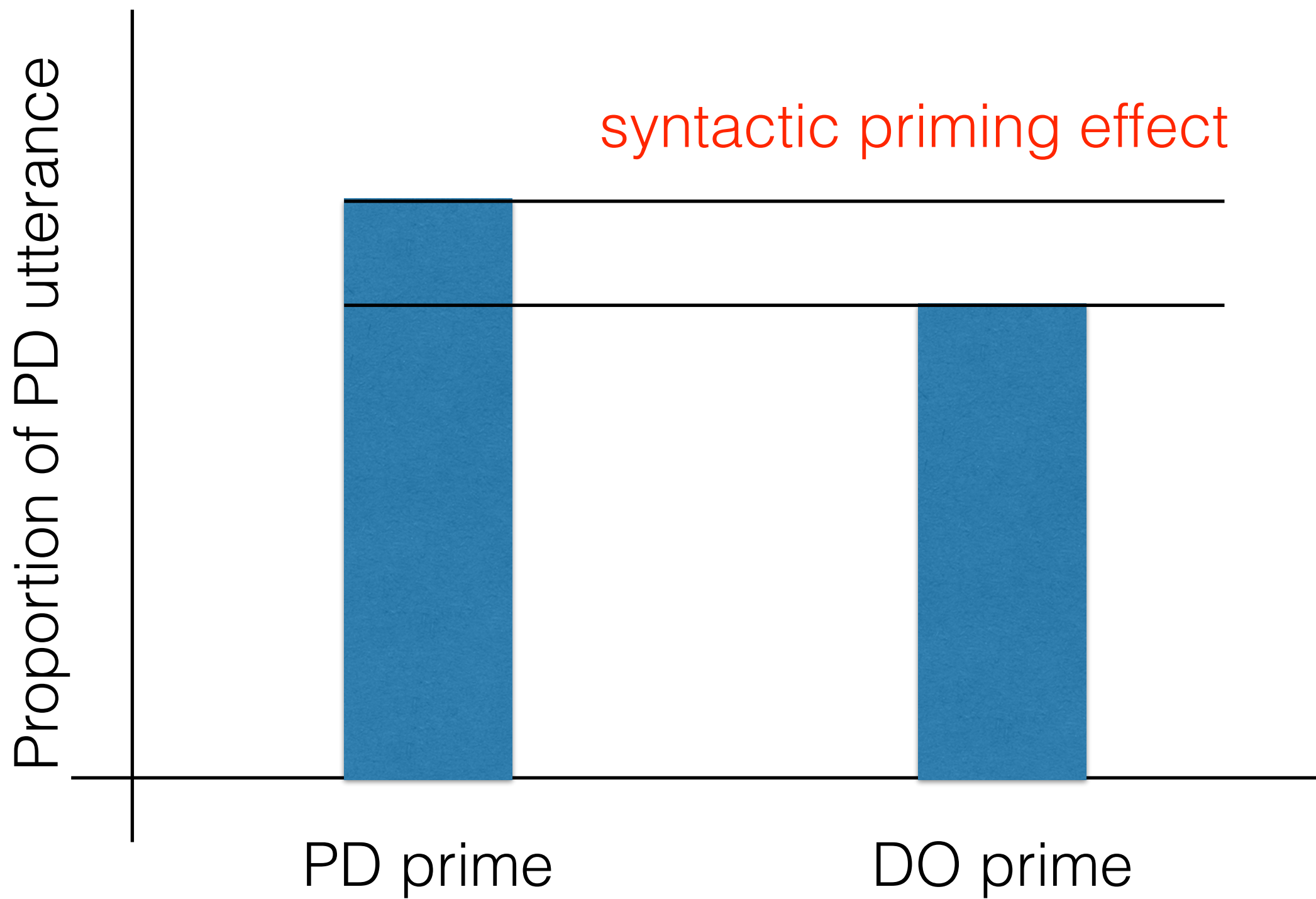


The man is giving the
present to the girl



The man is handing the
hat to the clown





Bock (1989)

Prime type

Prepositional *to*-dative
Prepositional *for*-dative
Double-object *to*-dative
Double-object *for*-dative

Examples

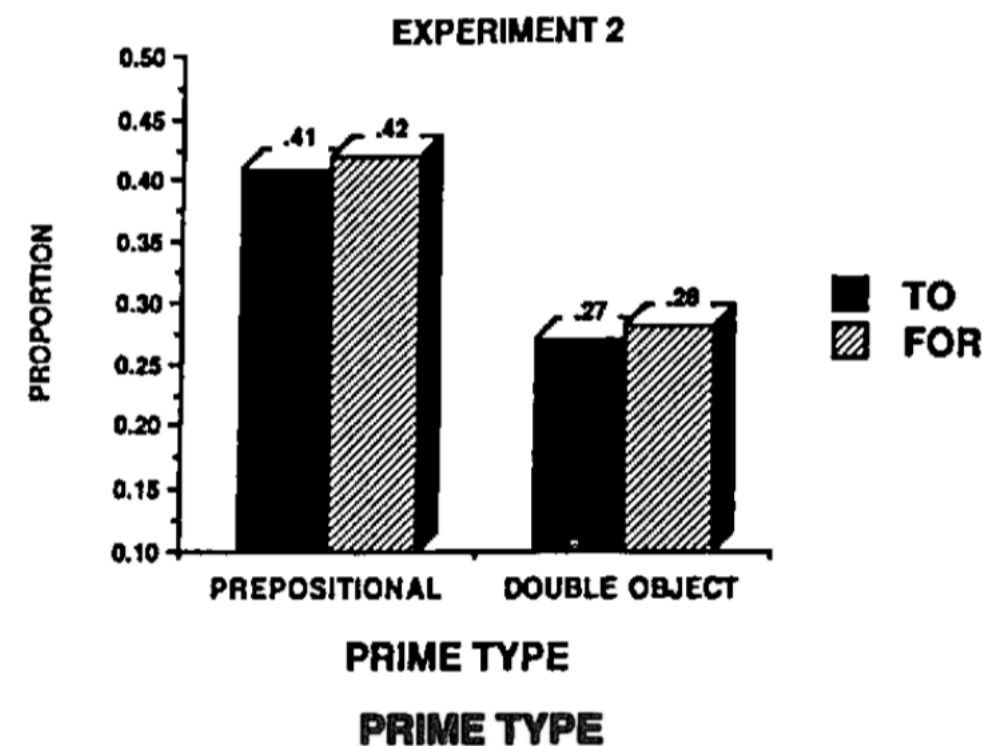
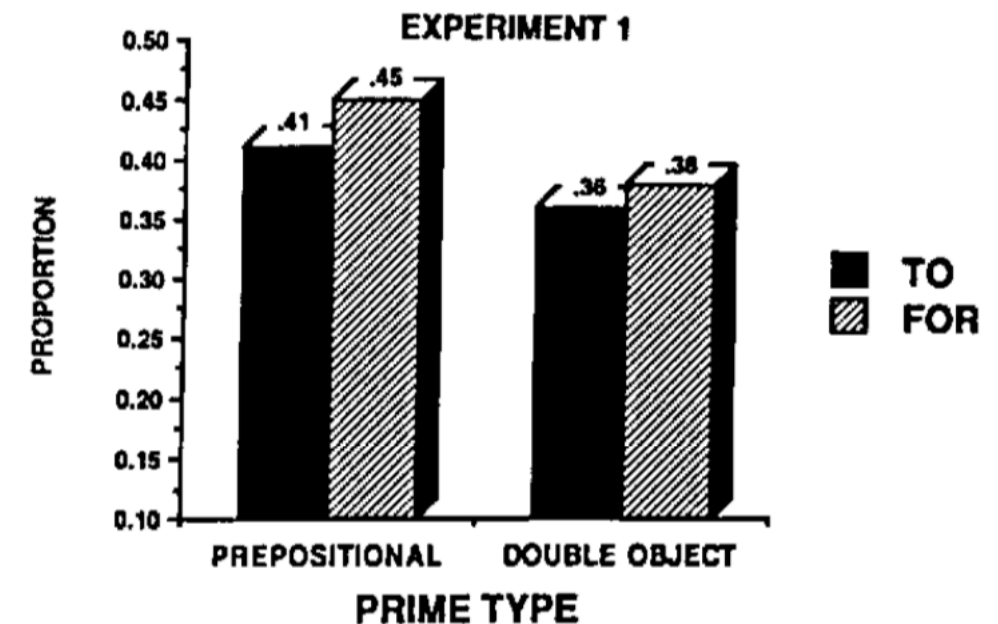
A cheerleader offered a seat to her friend.
A cheerleader saved a seat for her friend.
A cheerleader offered her friend a seat.
A cheerleader saved her friend a seat.

Prepositional *to*-dative
Prepositional *for*-dative
Double-object *to*-dative
Double-object *for*-dative

The secretary was taking a cake to her boss.
The secretary was baking a cake for her boss.
The secretary was taking her boss a cake.
The secretary was baking her boss a cake.

Prepositional *to*-dative
Prepositional *for*-dative
Double-object *to*-dative
Double-object *for*-dative

A rock star sold some pure cocaine to his manager.
A rock star got some pure cocaine for his manager.
A rock star sold his manager some pure cocaine.
A rock star got his manager some pure cocaine.



Structural priming

Speakers are more likely to use the same structure.

No word needs to be shared between the prime and the target sentences.

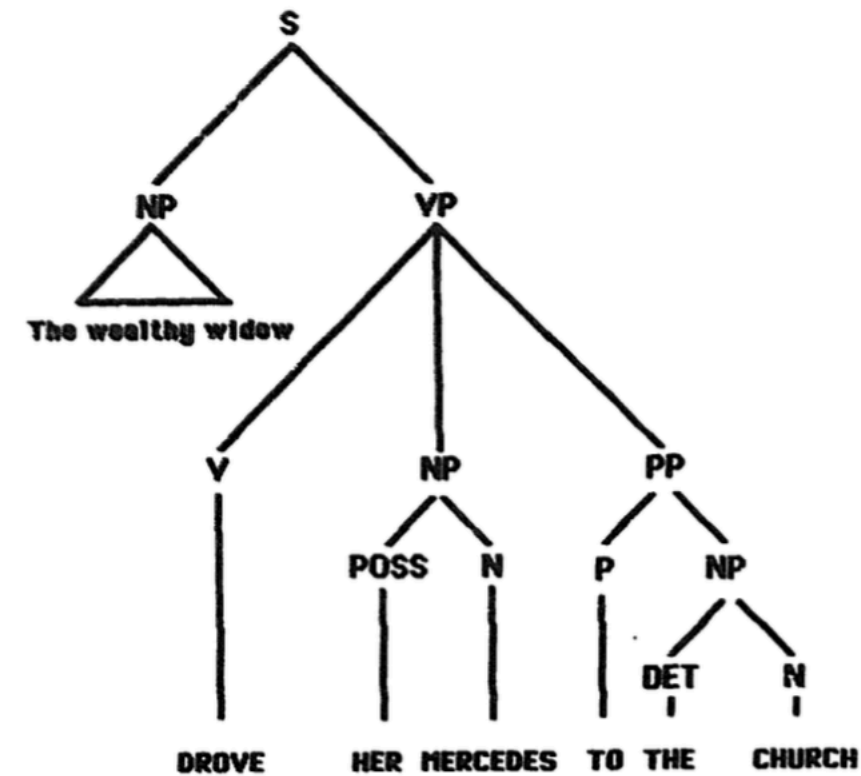
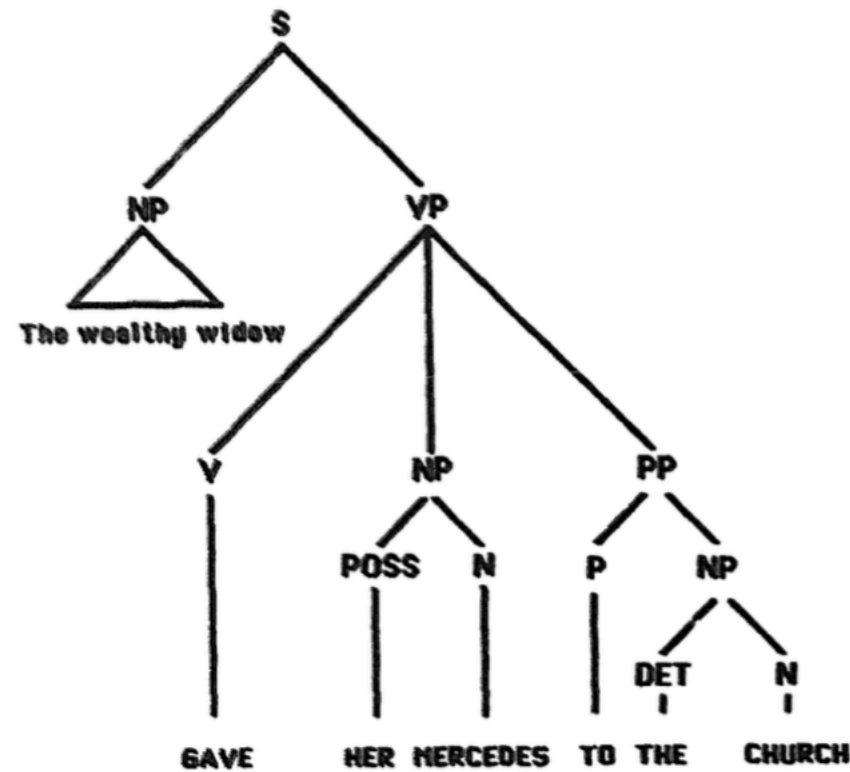
Taken as the evidence for the existence of word-independent structure.

Bock & Loebell (1990)

Examples of priming sentence sets from Experiment 1

Prime type	Examples
Prepositional dative Prepositional locative Double-object control	<i>The wealthy widow gave an old Mercedes to the church.</i> <i>The wealthy widow drove an old Mercedes to the church.</i> <i>The wealthy widow sold the church an old Mercedes.</i>
Prepositional dative Prepositional locative Double-object control	<i>IBM promised a bigger computer to the Sears store.</i> <i>IBM moved a bigger computer to the Sears store.</i> <i>IBM offered the Sears store a bigger computer.</i>
Prepositional dative Prepositional locative Double-object control	<i>The hospital showed the bill to the patient by mistake.</i> <i>The hospital returned the bill to the patient by mistake.</i> <i>The hospital sent the patient the bill by mistake.</i>

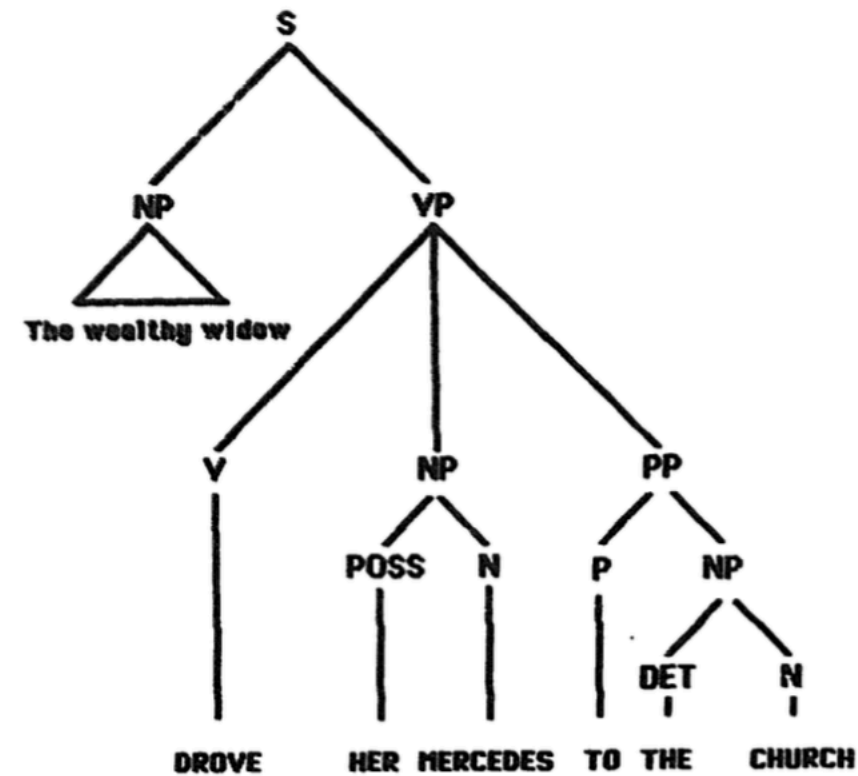
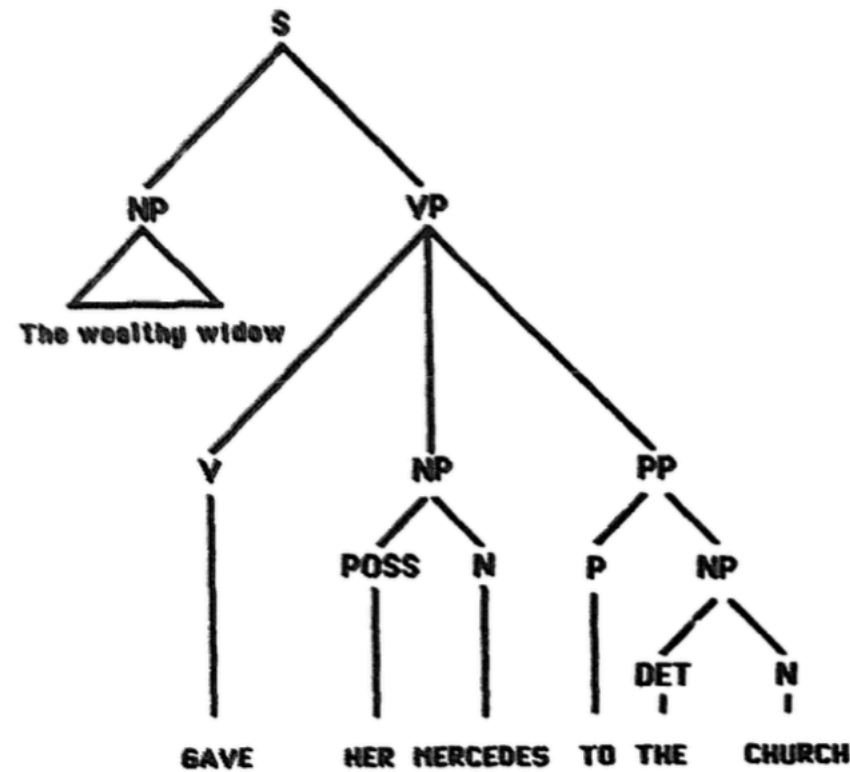
Bock & Loebell (1990)



Examples of priming sentence sets from Experiment 1

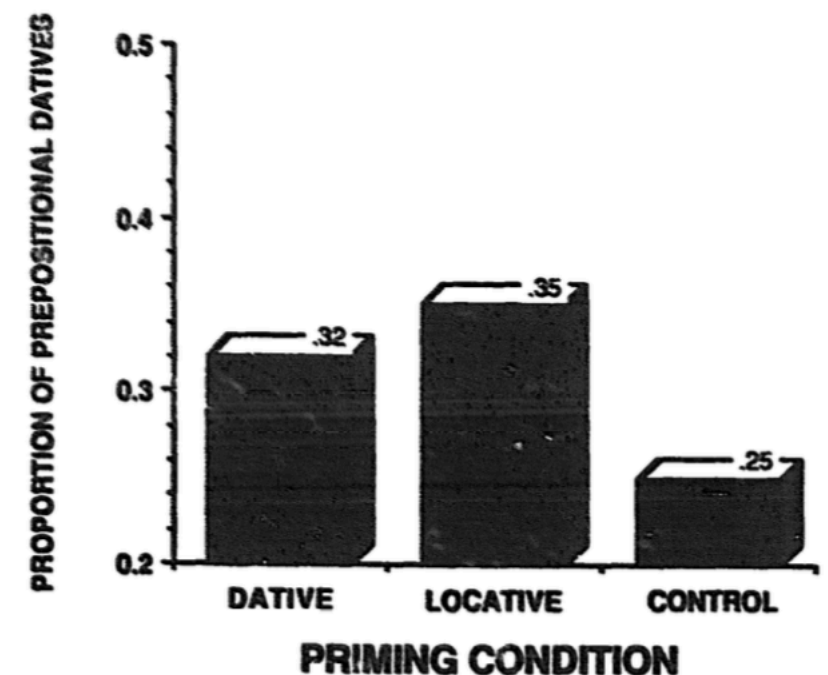
Prime type	Examples
Prepositional dative	<i>The wealthy widow gave an old Mercedes to the church.</i>
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Double-object control	<i>The wealthy widow sold the church an old Mercedes.</i>
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Bock & Loebell (1990)



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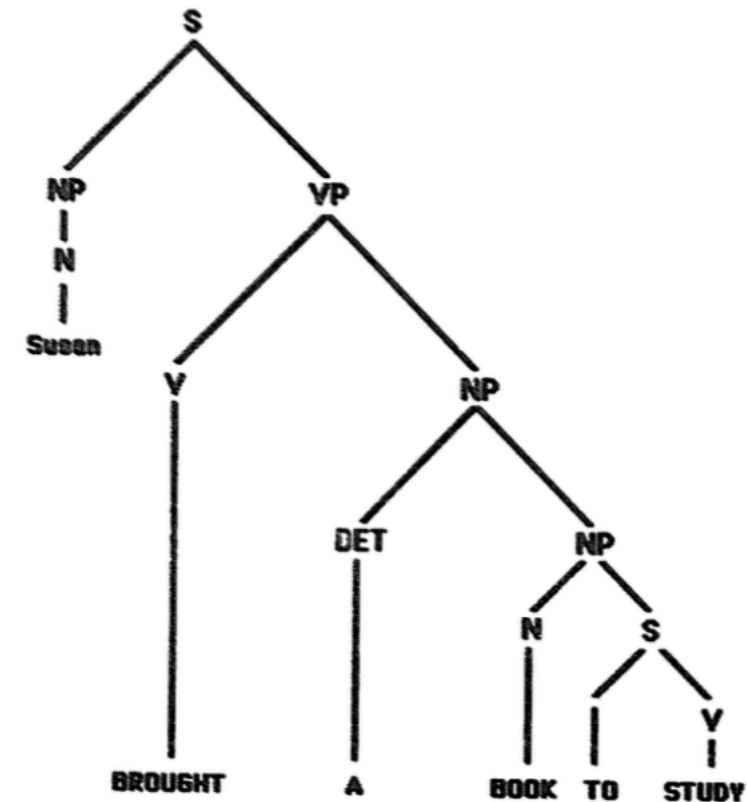
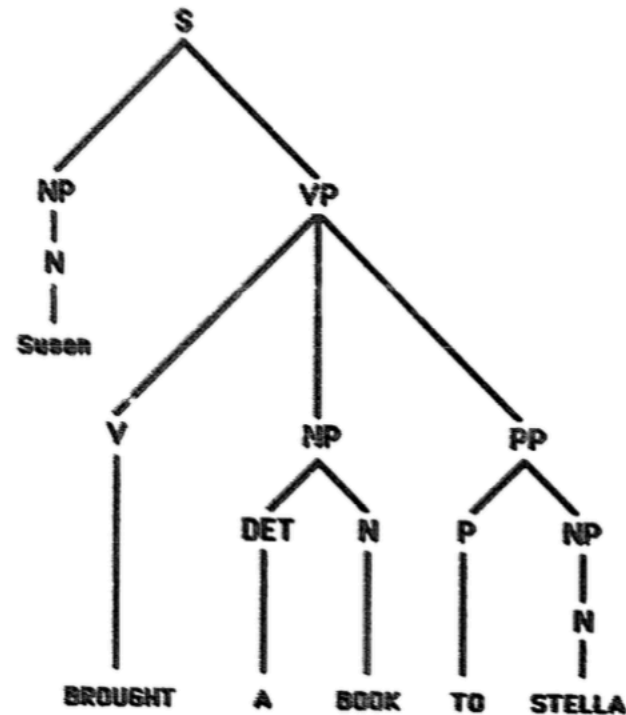
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Bock & Loebell (1990)

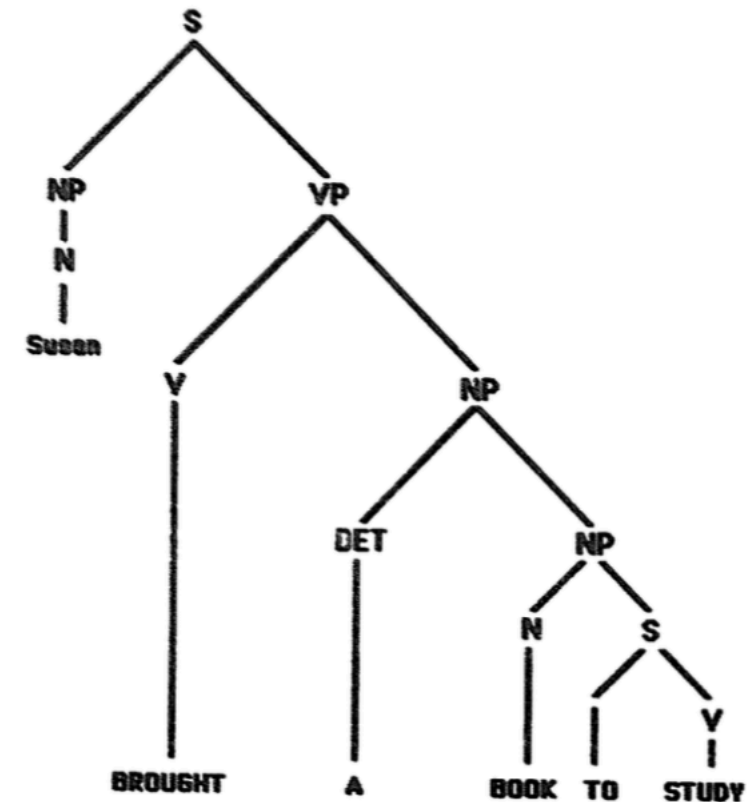
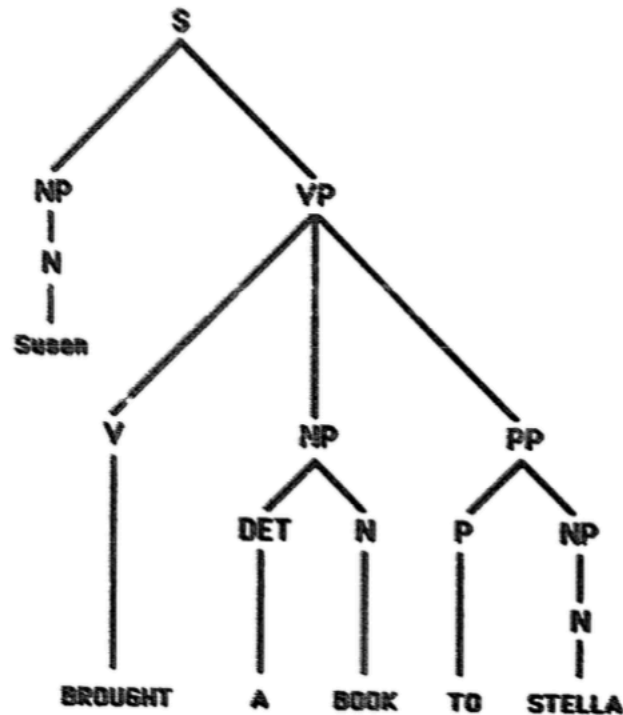
Prime type	Examples
Prepositional dative Infinitive Double-object	<i>Susan brought a book to Stella.</i> <i>Susan brought a book to study.</i> <i>Susan brought the student a book.</i>
Prepositional dative Infinitive Double-object	<i>The candidate wrote a letter to the state delegation.</i> <i>The candidate wrote a letter to explain his position.</i> <i>The candidate wrote the Republican mayor a letter.</i>
Prepositional dative Infinitive Double-object	<i>The defendant told a lie to the crowded courtroom.</i> <i>The defendant told a lie to protect his daughter.</i> <i>The defendant told the suspicious lawyer a lie.</i>
Prepositional dative Infinitive Double-object	<i>The housewife mailed a check to Michigan's Wildlife Fund.</i> <i>The housewife mailed a check to pay the electric bill.</i> <i>The housewife mailed the minister's bankrupt church a check.</i>

Bock & Loebell (1990)

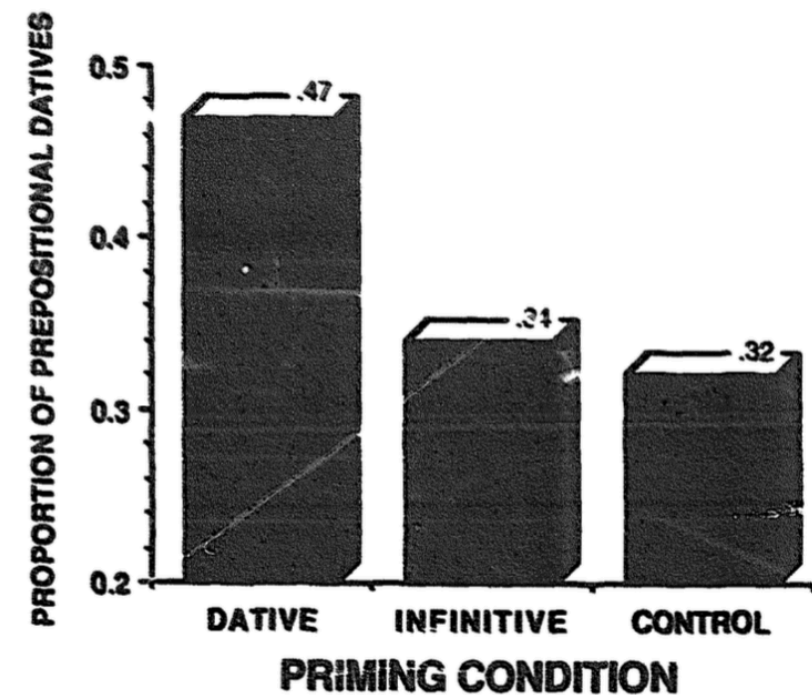


Prime type	Examples
Prepositional dative	<i>Susan brought a book to Stella.</i>
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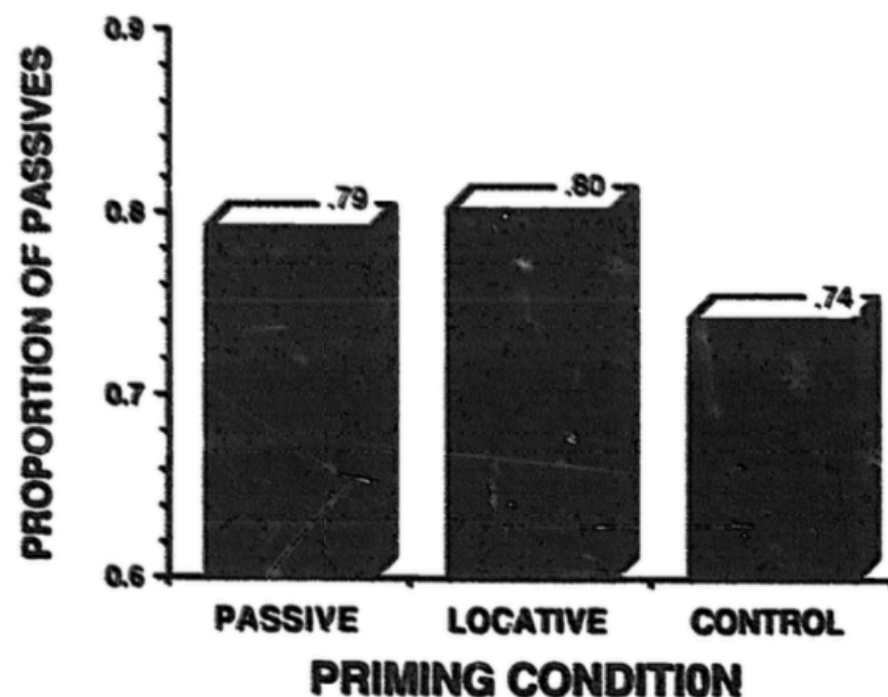


Bock & Loebell (1990)

Prime type	Examples
Passive	<i>The construction worker was hit by the bulldozer.</i>
Locative	<i>The construction worker was digging by the bulldozer.</i>
Active	<i>The construction worker drove the bulldozer.</i>
Passive	<i>The minister was cut by the broken stained glass window.</i>
Locative	<i>The minister was praying by the broken stained glass window.</i>
Active	<i>The minister fixed the broken stained glass window.</i>
Passive	<i>The foreigner was confused by the blinking traffic light.</i>
Locative	<i>The foreigner was loitering by the blinking traffic light.</i>
Active	<i>The foreigner misunderstood the blinking traffic light.</i>
Passive	<i>The 747 was alerted by the airport's control tower.</i>
Locative	<i>The 747 was landing by the airport's control tower.</i>
Active	<i>The 747 radioed the airport's control tower.</i>

Bock & Loebell (1990)

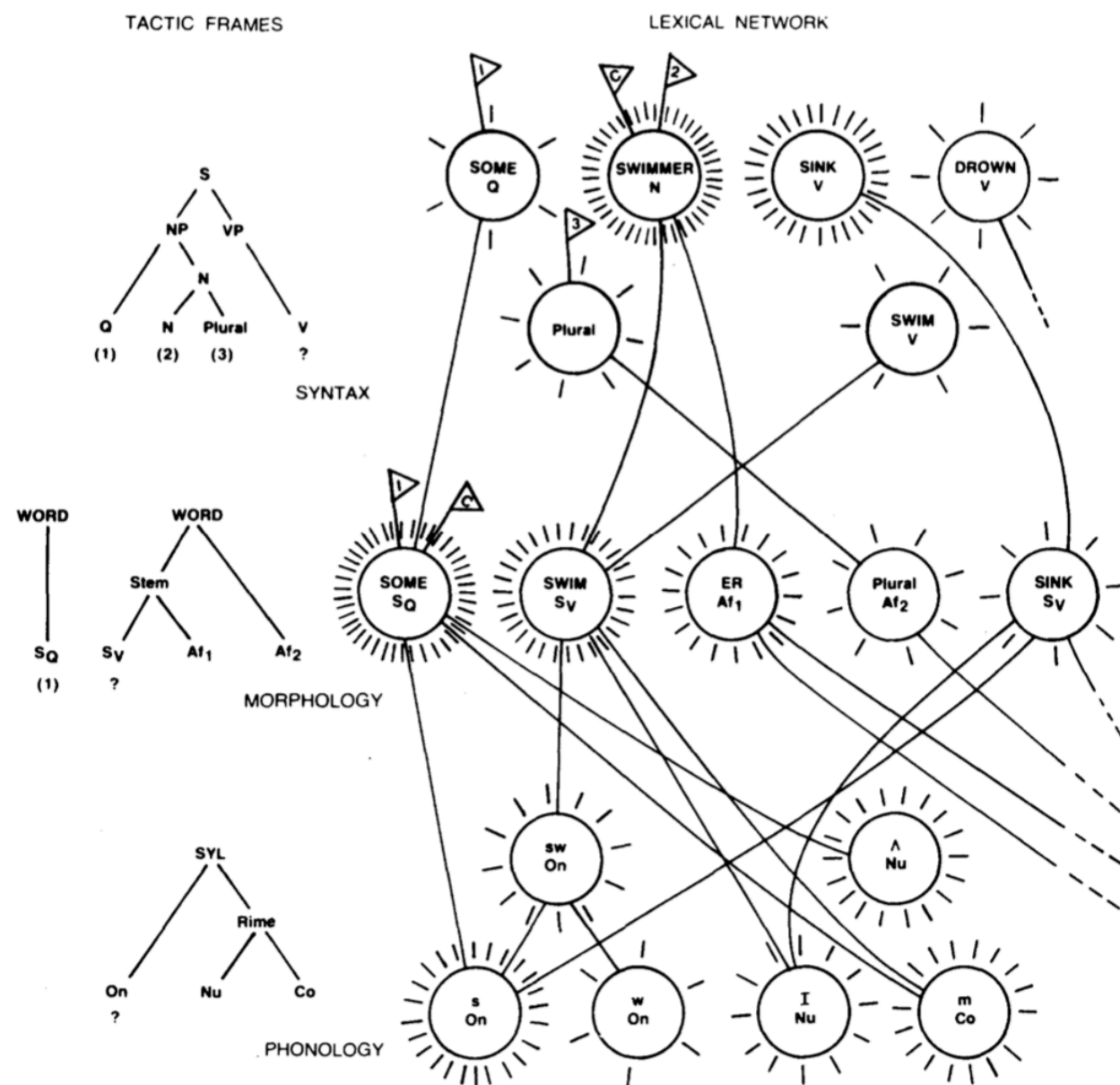
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Locative-dative priming
 Locative-passive priming
 No infinitive-dative priming

-> phrase structure represented independently from meaning?

Abstraction in syntax



Dell (1986)

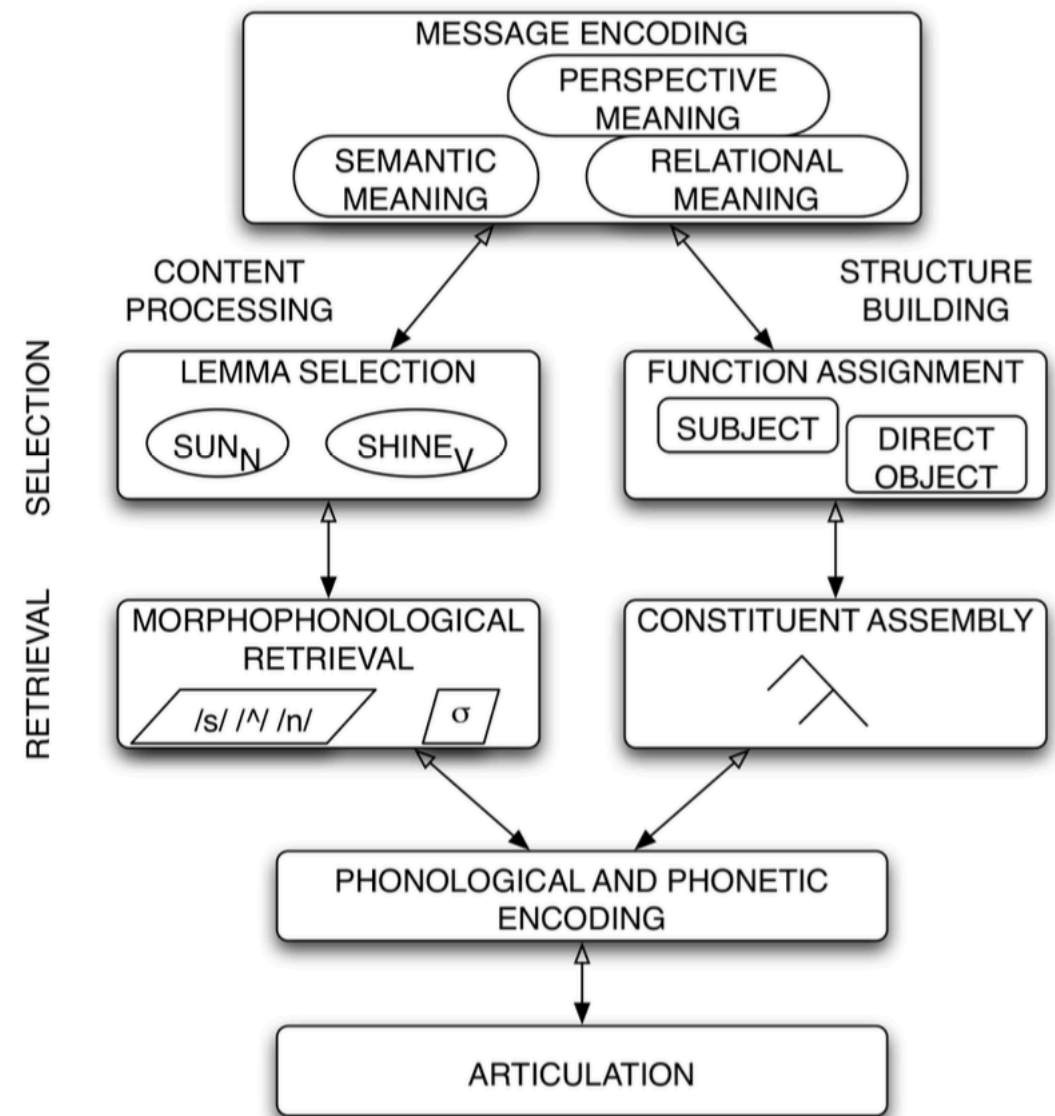


Figure 1. Schematic of consensus model of grammatical encoding. Filled arrowheads mark direction of primary information flow, open arrowheads mark possible feedback information flow.

Ferreira et al. (2019)

Sample prime stimuli used in each of the four conditions.

Active	The 747	radioed	the airport control tower
Passive	The 747	was radioed	by the airport control tower
By-locative	The 747	was landing	by the airport control tower
Non-by-locative	The 747	has landed	near the airport control tower

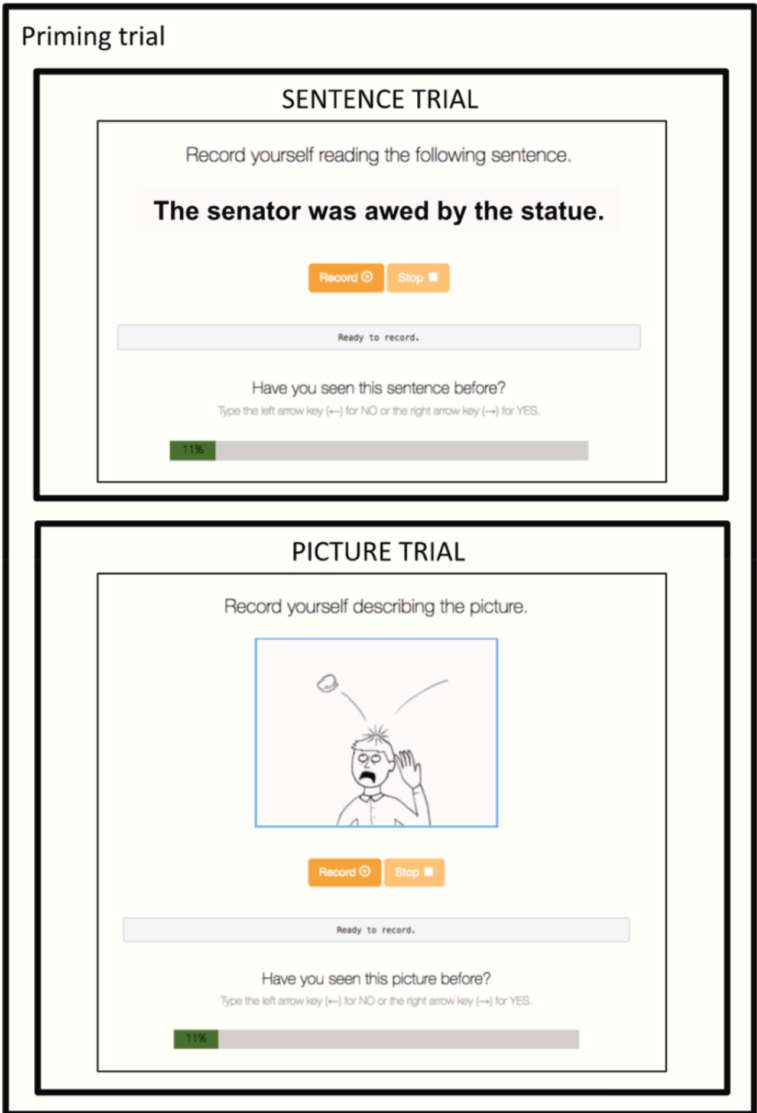


Fig. 2. Procedure and example materials.

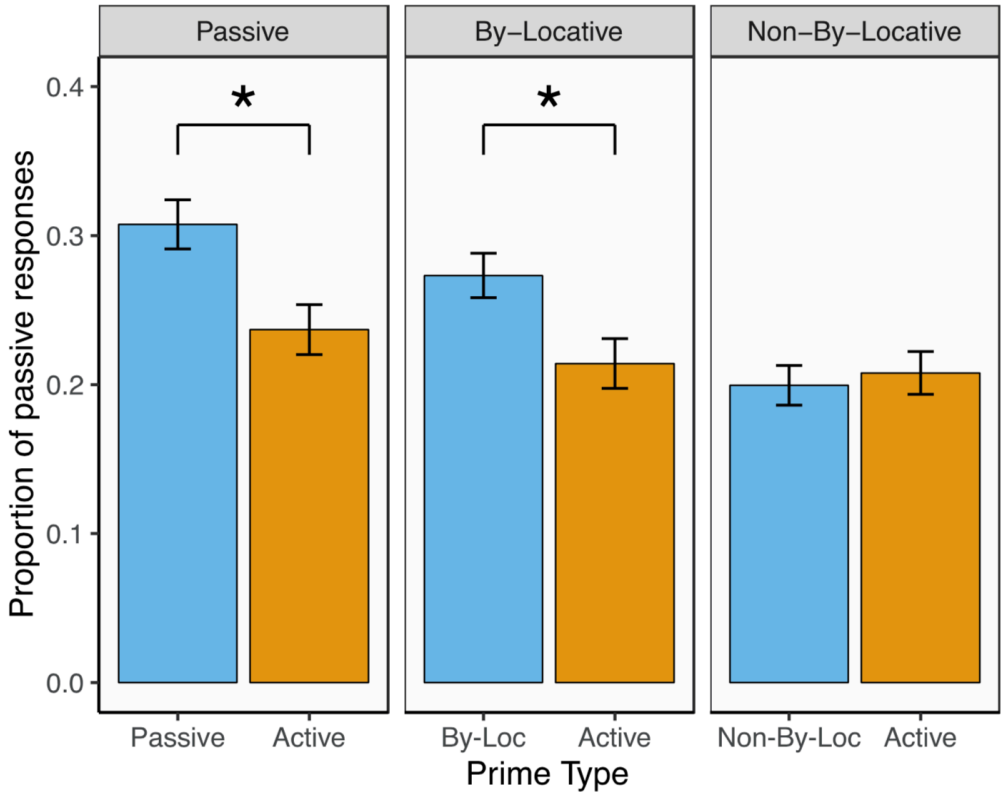


Fig. 3. Overall proportion of passive productions by Prime Type by Prime Condition. Error bars reflect by-subject standard errors. By-Loc = *By-locative*; Non-By-Loc = *Non-by-locative*.

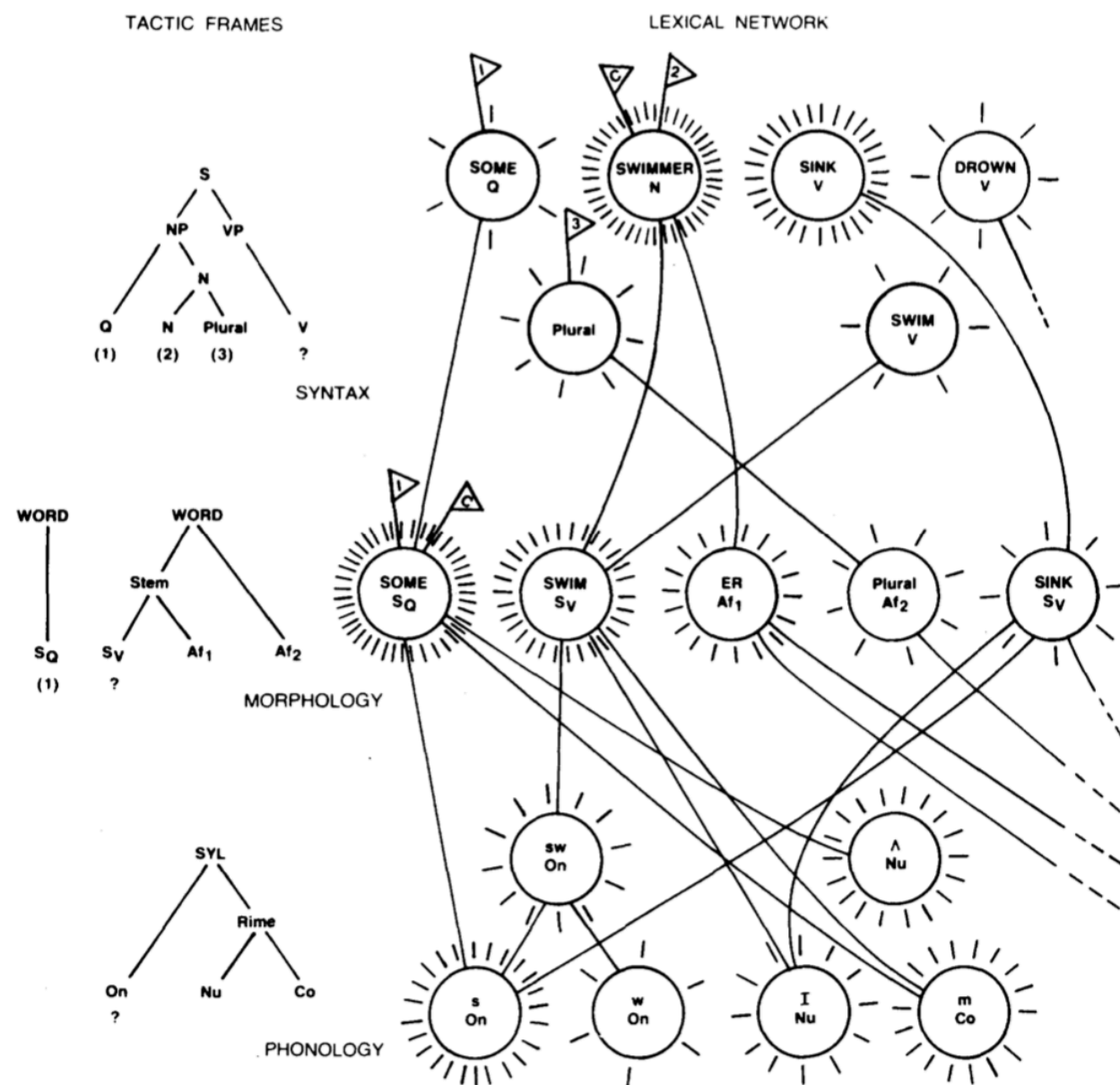
Structural priming and abstraction in syntax?

Perhaps we can explain structural priming in terms of lexical overlap OR meaning sharedness?

- Locative to dative and for-to-to dative: thematic role/info structure shared?
- Locative to passive: “by” shared.

Discuss: do we need to postulate lexically independent structural representation to explain the syntactic priming effect?

Abstraction in syntax



Dell (1986)

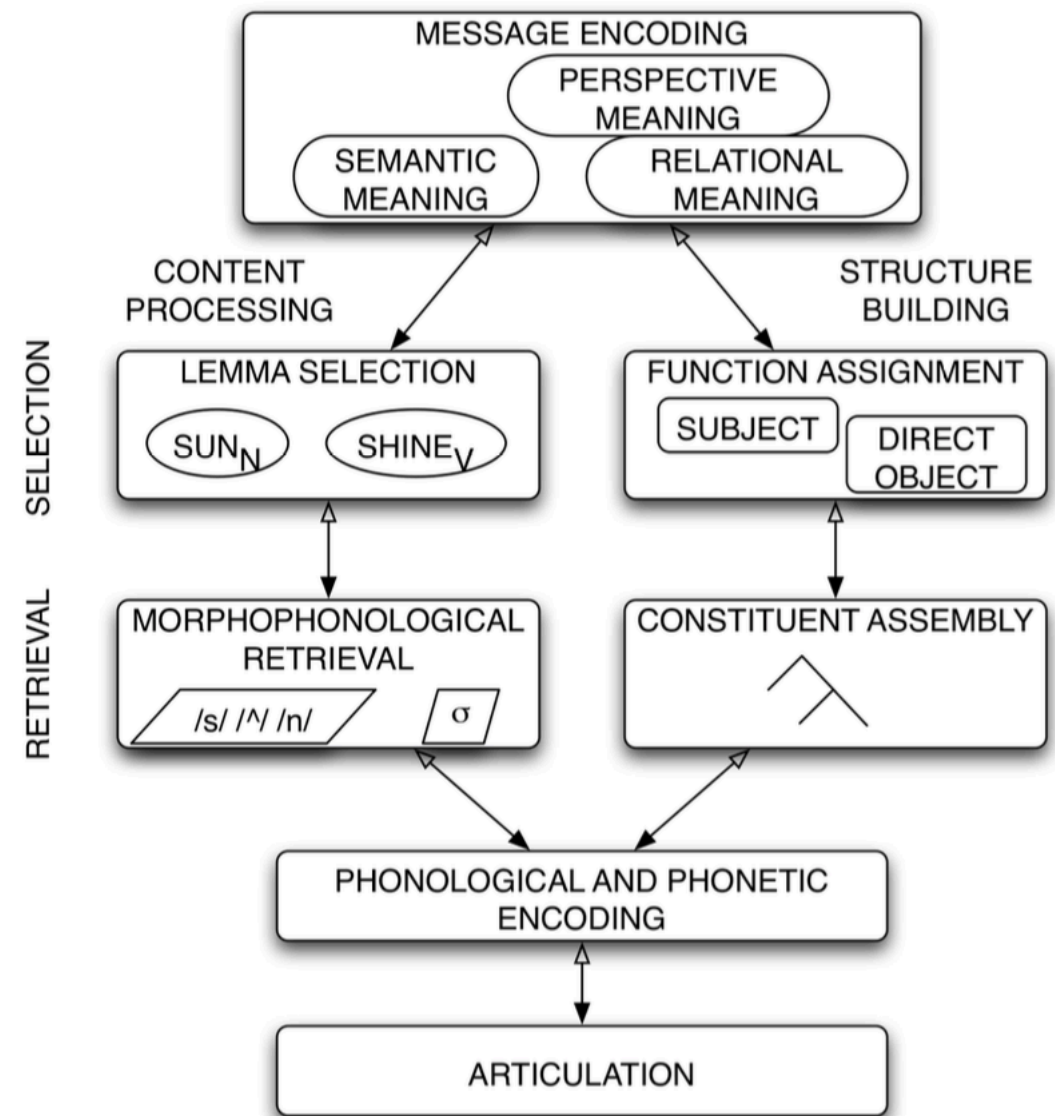


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