

# Abstraction in language production

## LING 611 Spring 2021

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# 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

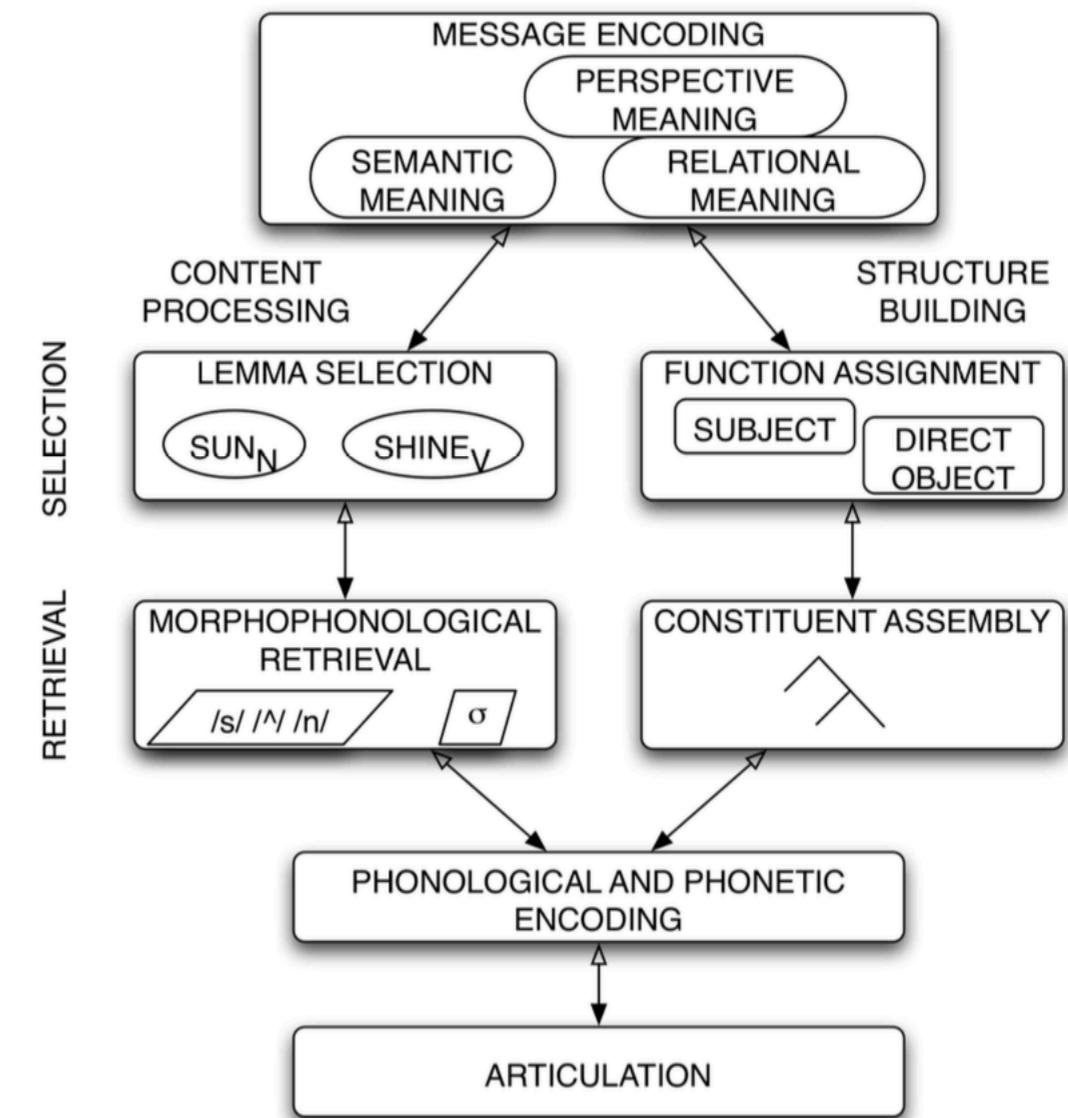
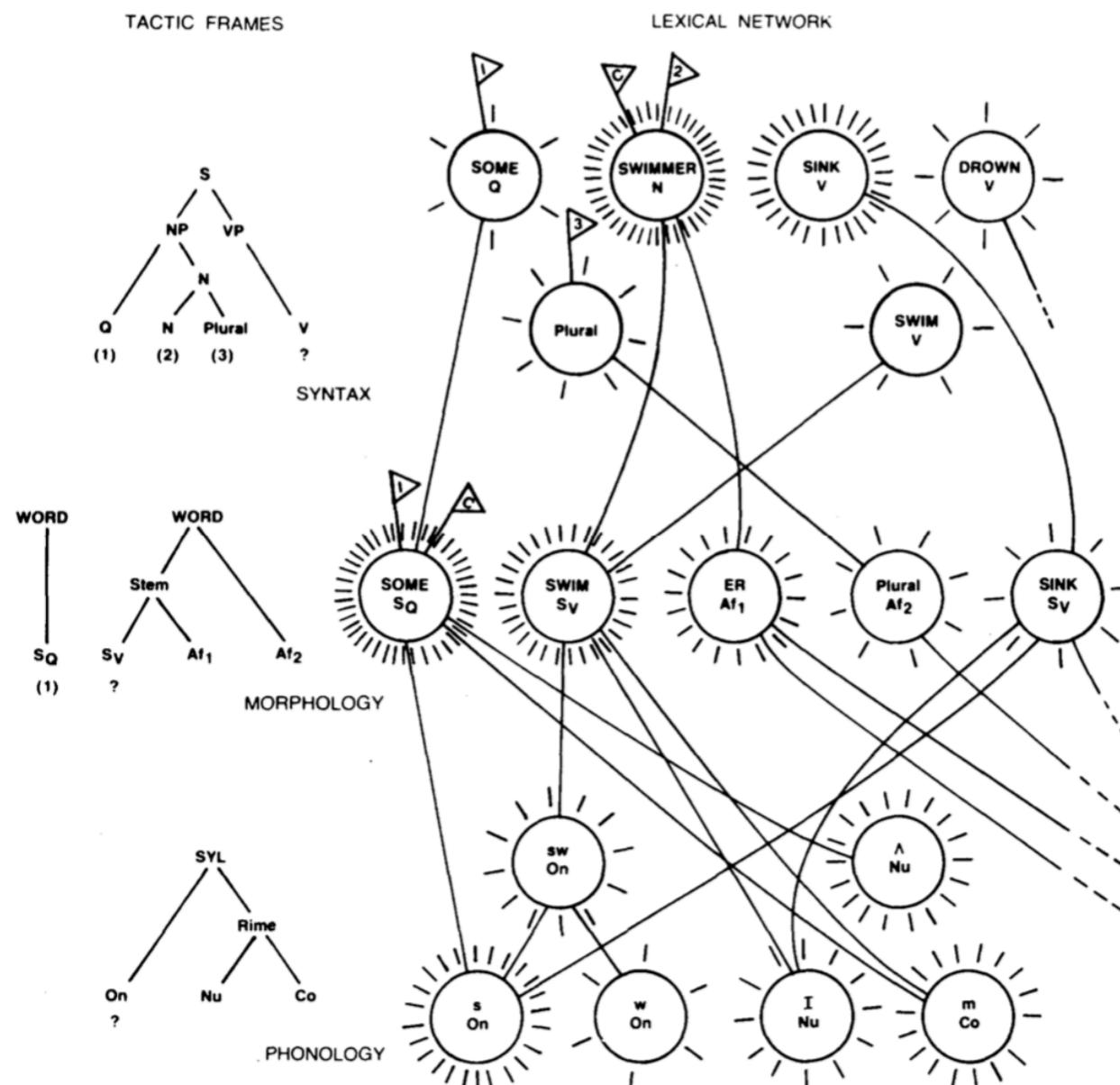


Figure 1. Schematic of consensus model of grammatical encoding. Filled arrowheads mark direction of primary information flow, open arrowheads mark possible feedback information flow.

# 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



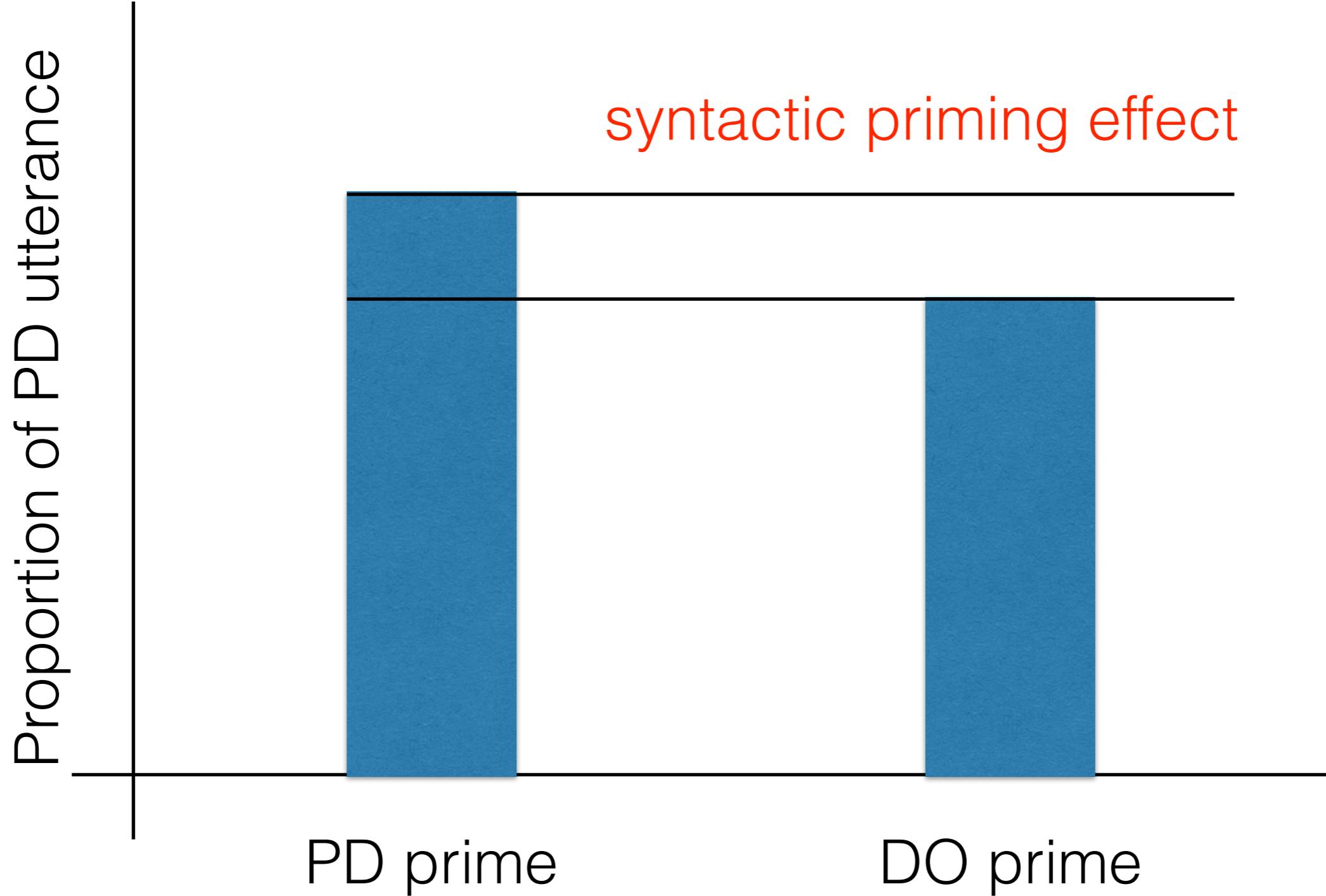
The man is handing the hat to the clown

Proportion of PD utterance

PD prime

DO prime





# Bock (1989)

Prime type

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

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

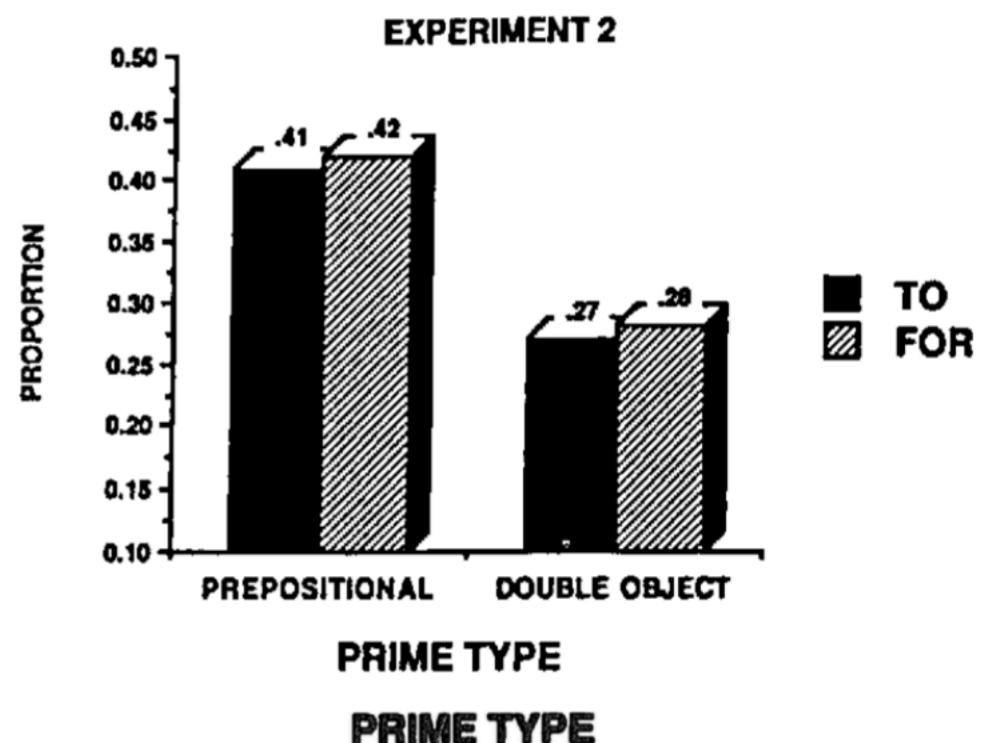
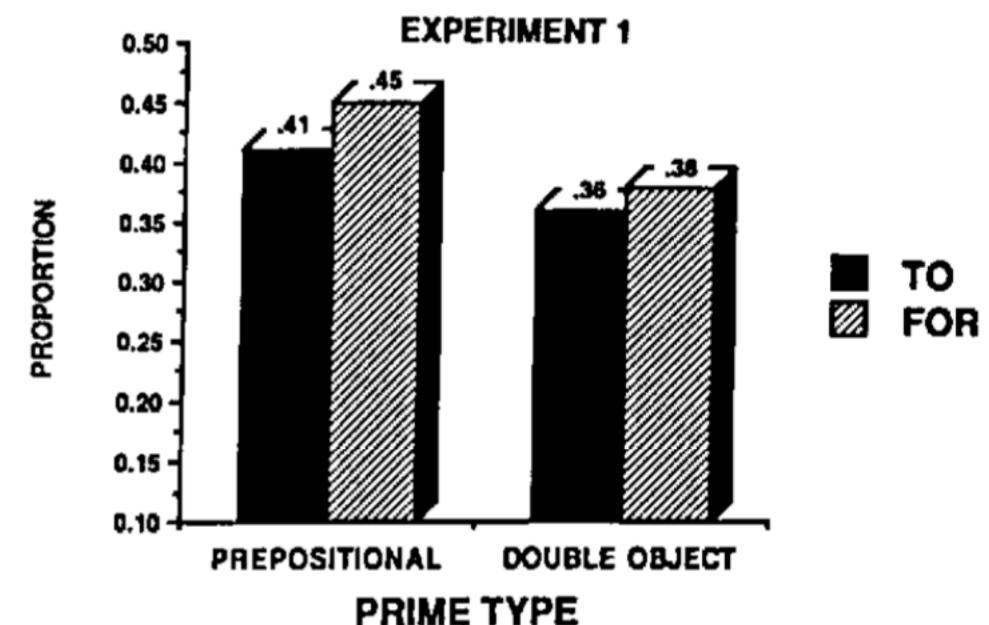
Prepositional *to*-dative  
Prepositional *for*-dative  
Double-object *to*-dative  
Double-object *for*-dative

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.*

*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.*

*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.

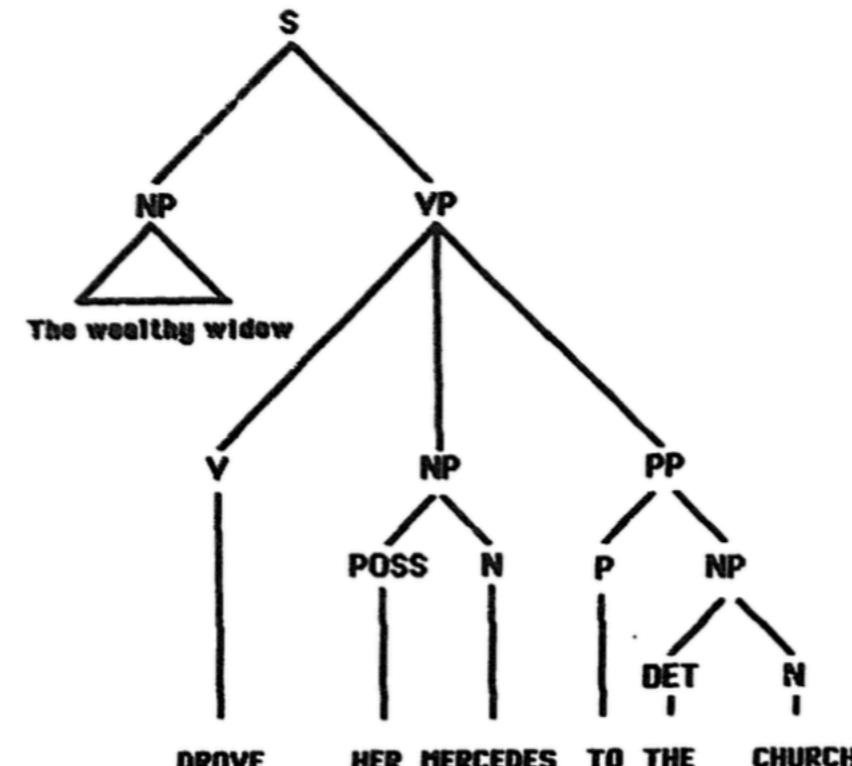
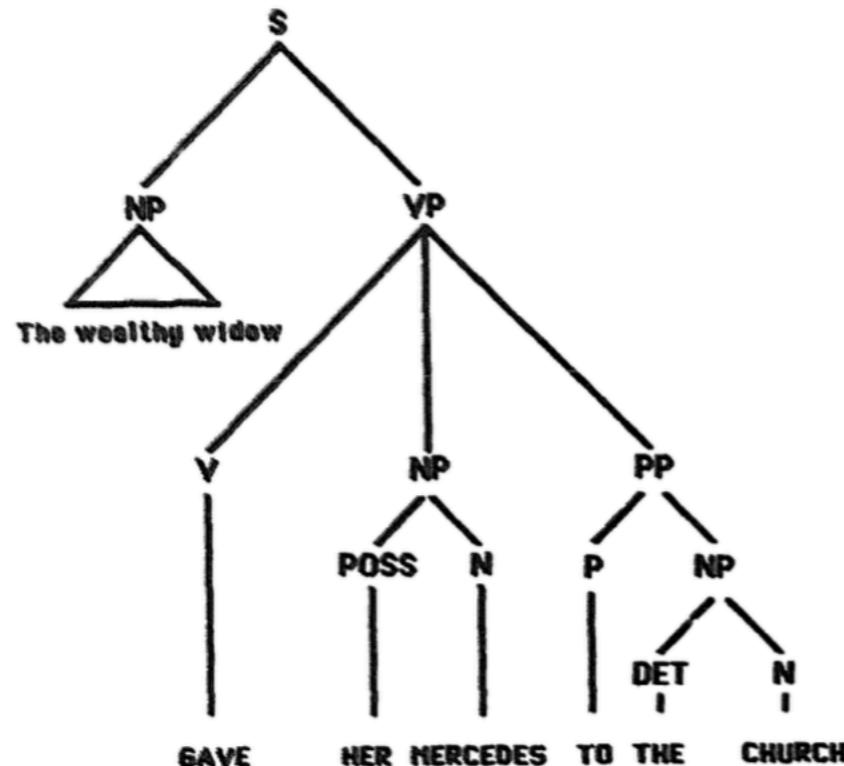
Taken as the evidence for the existence of word-independent structure.

# Bock & Loebell (1990)

## *Examples of priming sentence sets from Experiment 1*

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

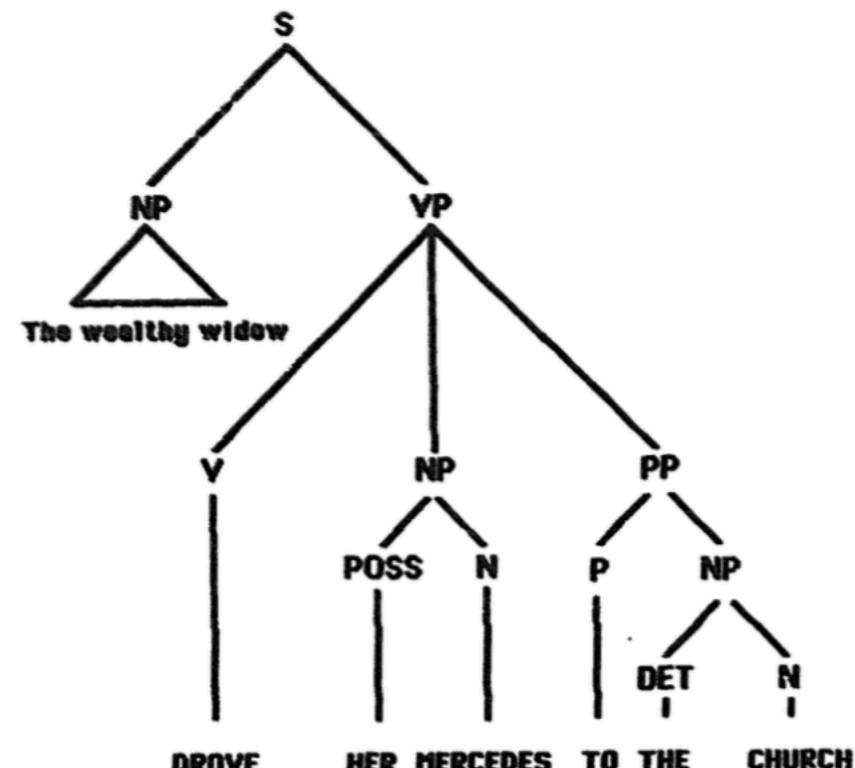
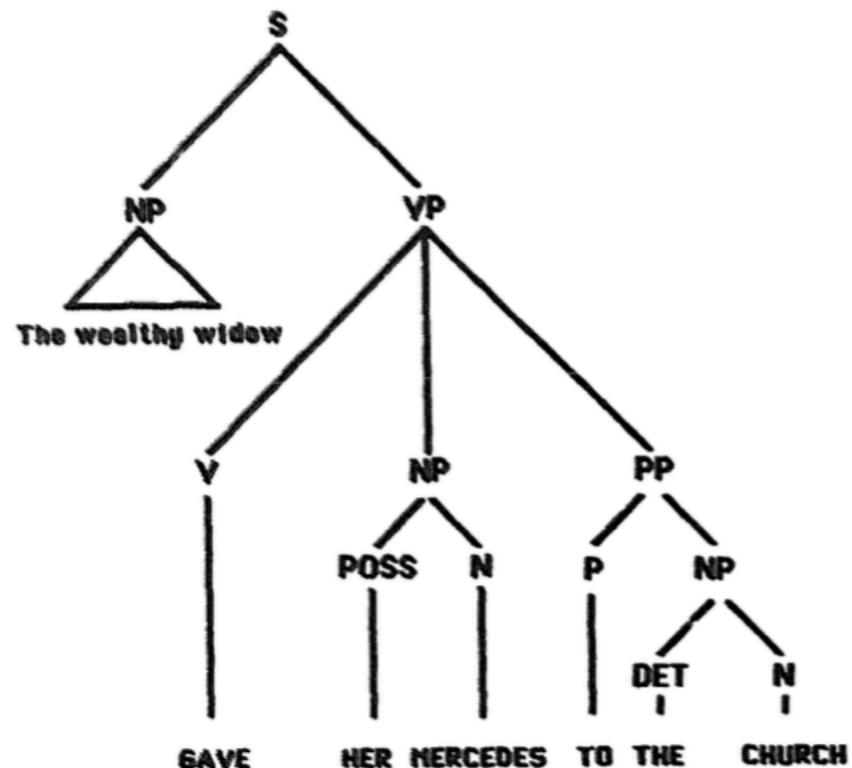
# Bock & Loebell (1990)



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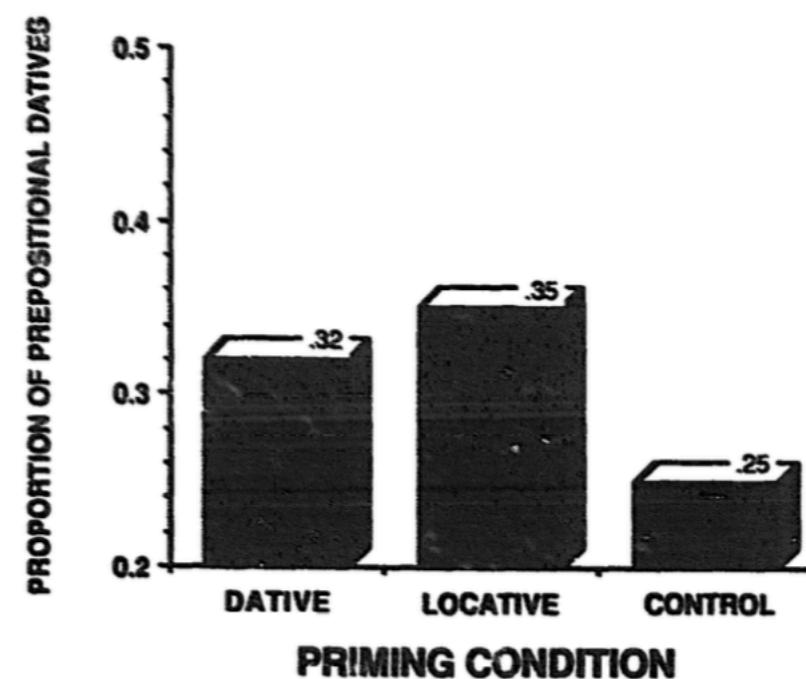
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# Bock & Loebell (1990)



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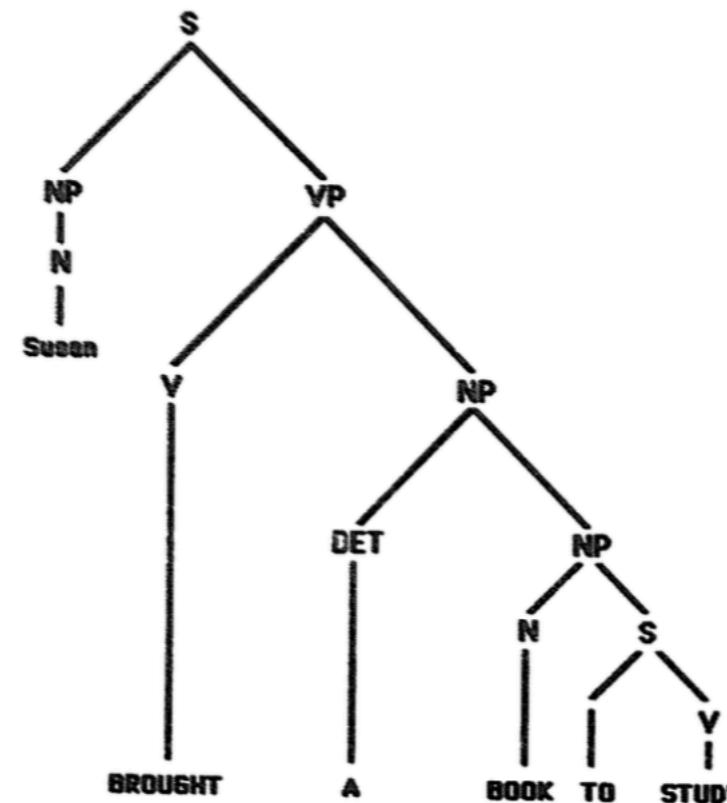
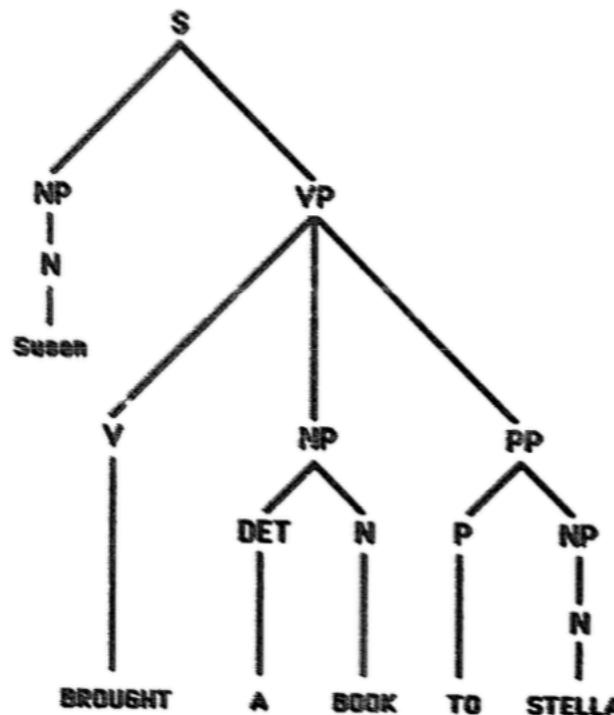
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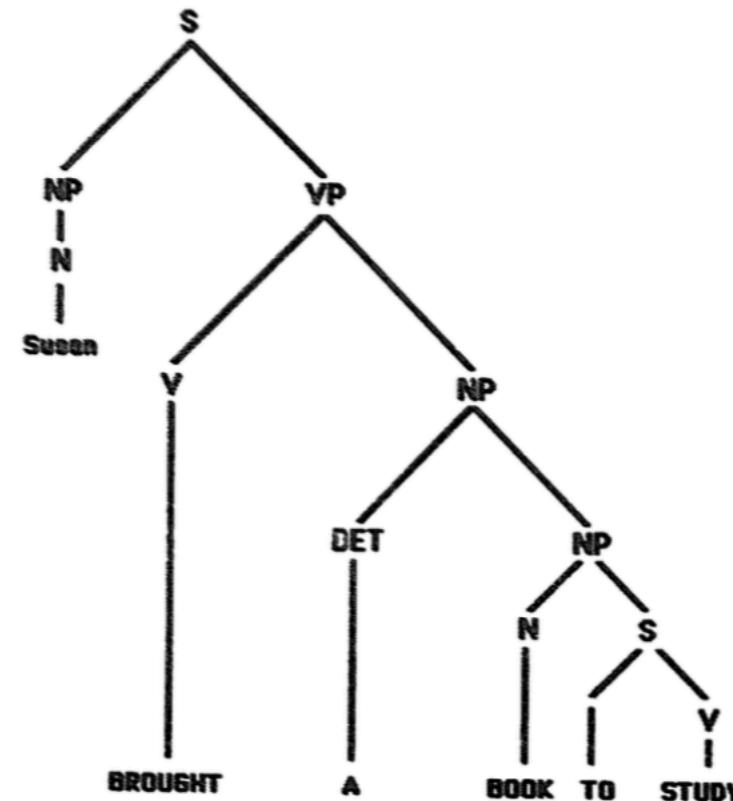
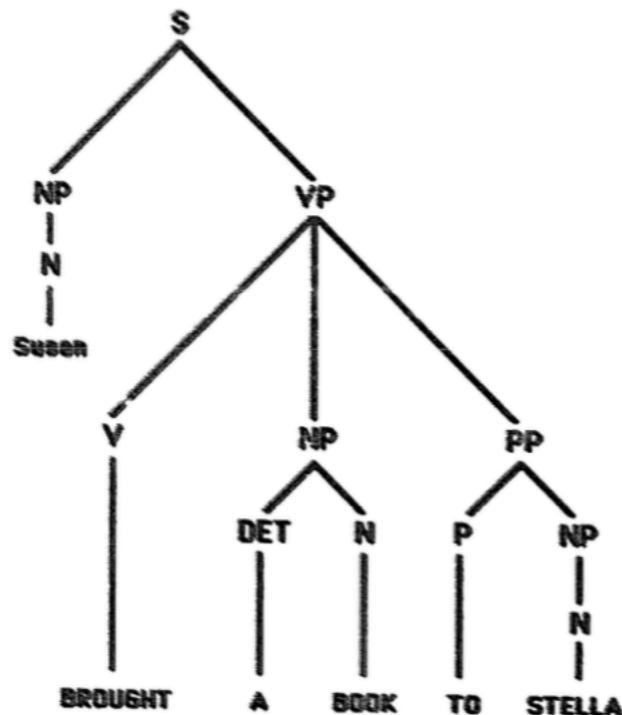
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Prepositional dative	<i>Susan brought a book to Stella.</i>
Infinitive	<i>Susan brought a book to study.</i>
Double-object	<i>Susan brought the student a book.</i>
Prepositional dative	<i>The candidate wrote a letter to the state delegation.</i>
Infinitive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

# Bock & Loebell (1990)

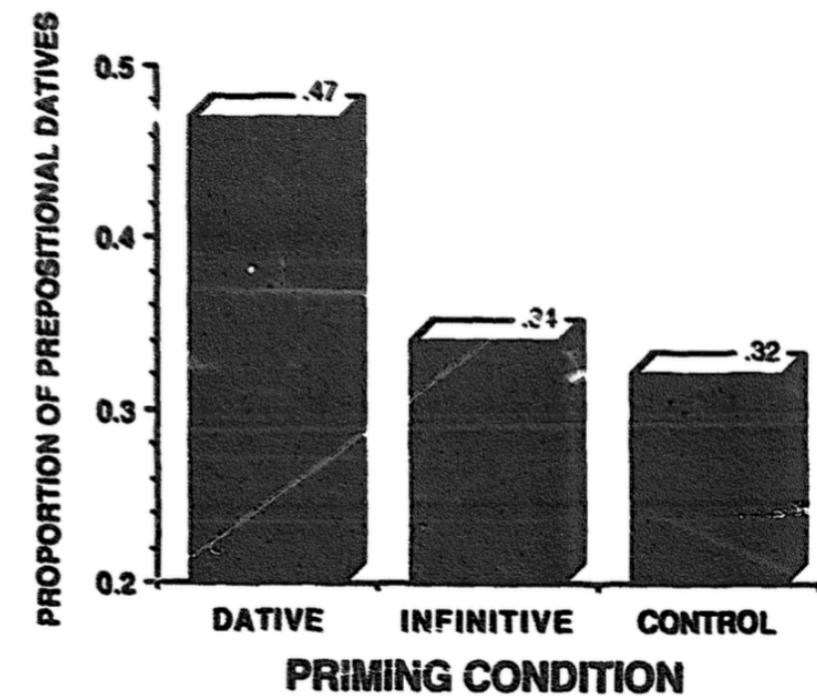


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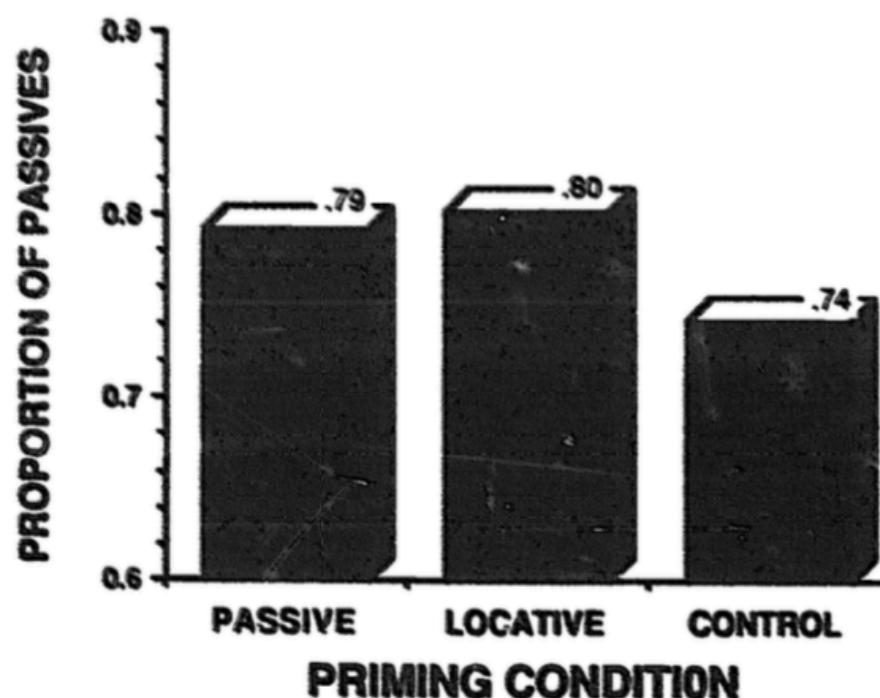


# Bock & Loebell (1990)

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>

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

-> phrase structure represented independently from meaning?

# Abstraction in syntax

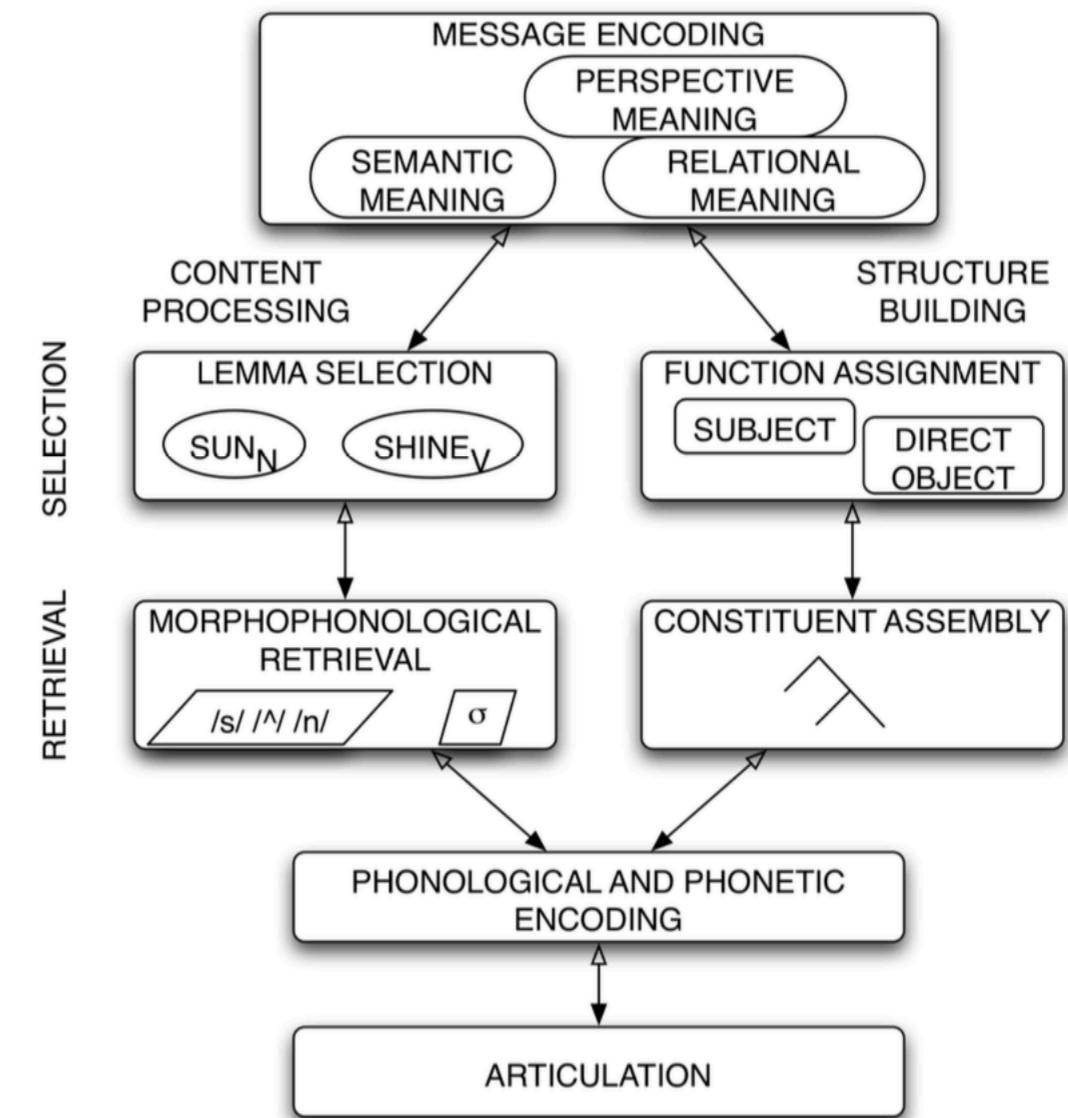
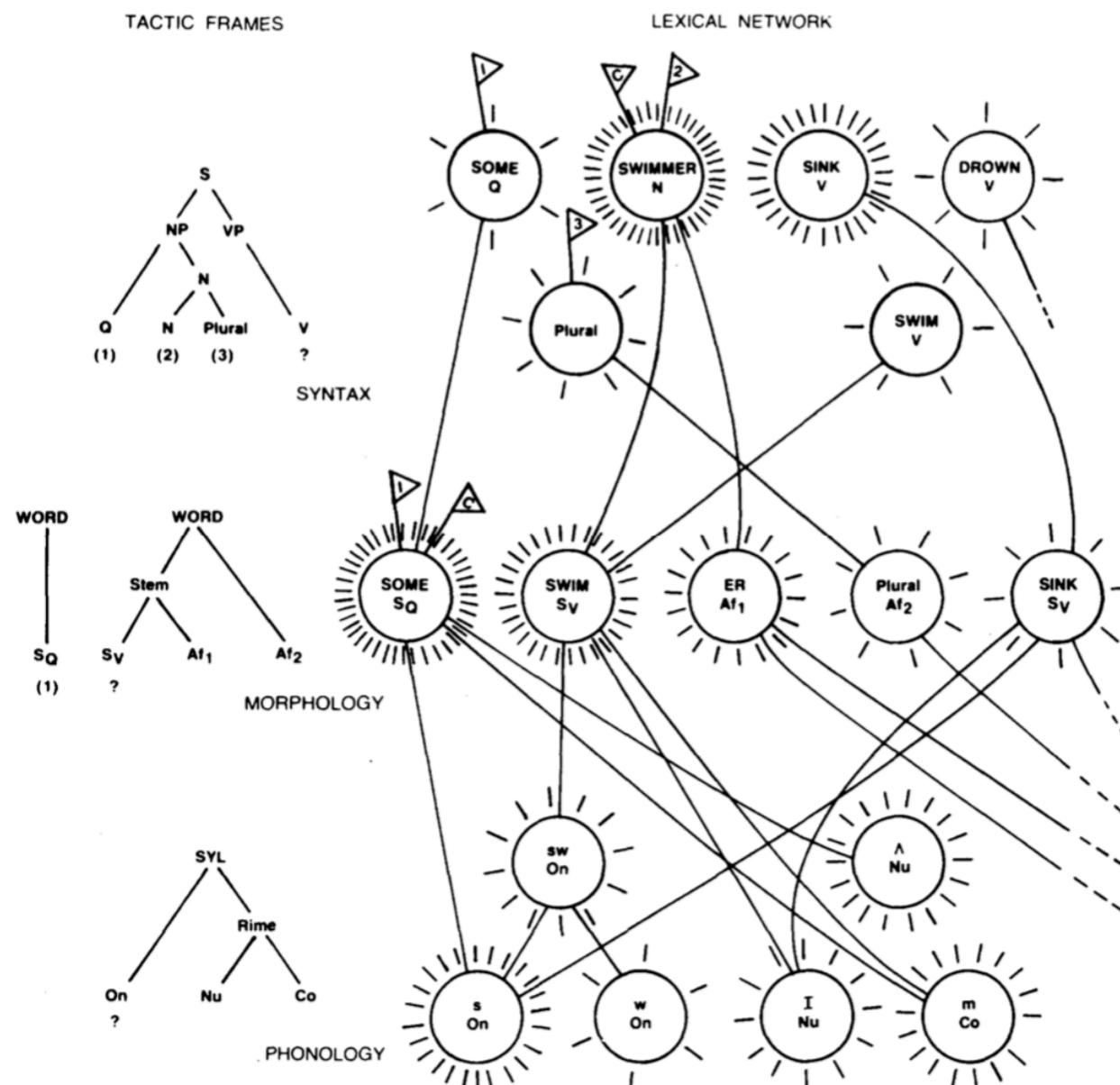
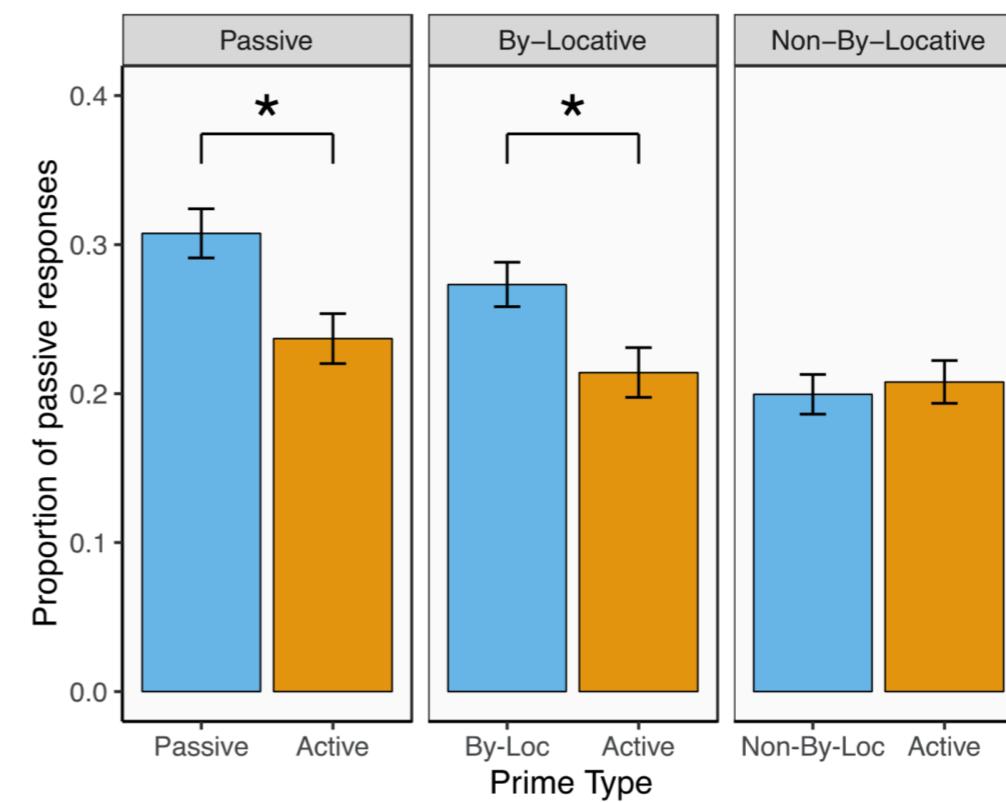
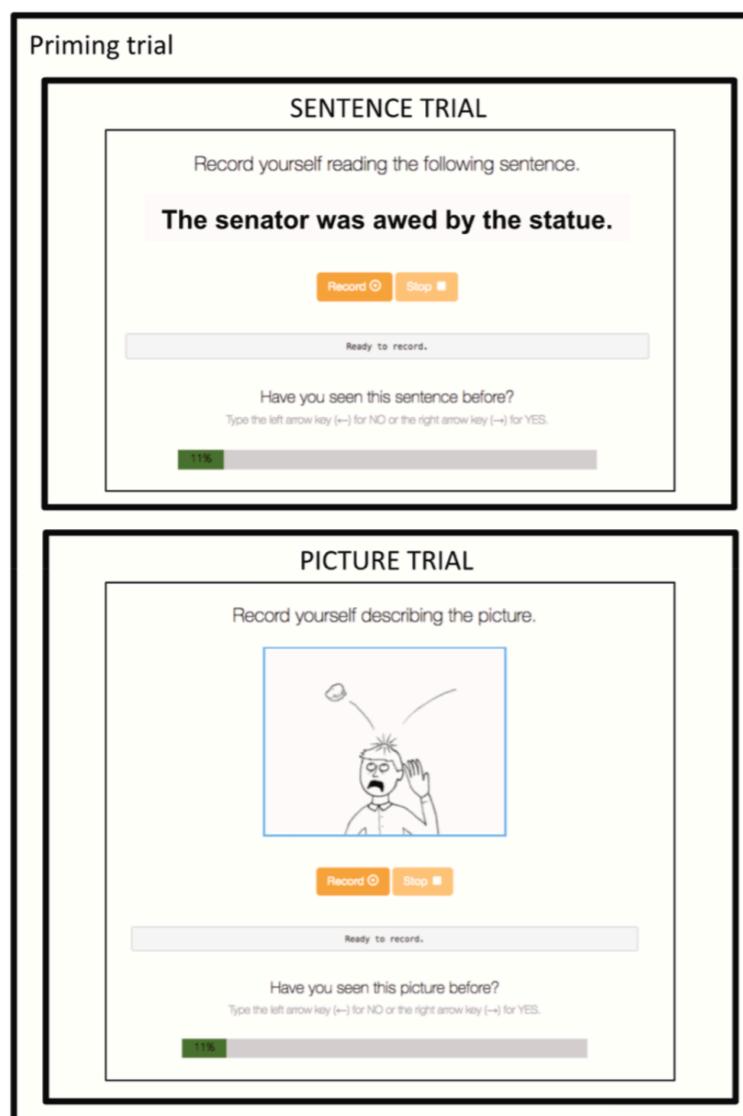


Figure 1. Schematic of consensus model of grammatical encoding. Filled arrowheads mark direction of primary information flow, open arrowheads mark possible feedback information flow.

# Ziegler 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
<i>By-locative</i>	The 747	was landing	by the airport control tower
<i>Non-by-locative</i>	The 747	has landed	near the airport control tower



**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*.

**Fig. 2.** Procedure and example materials.

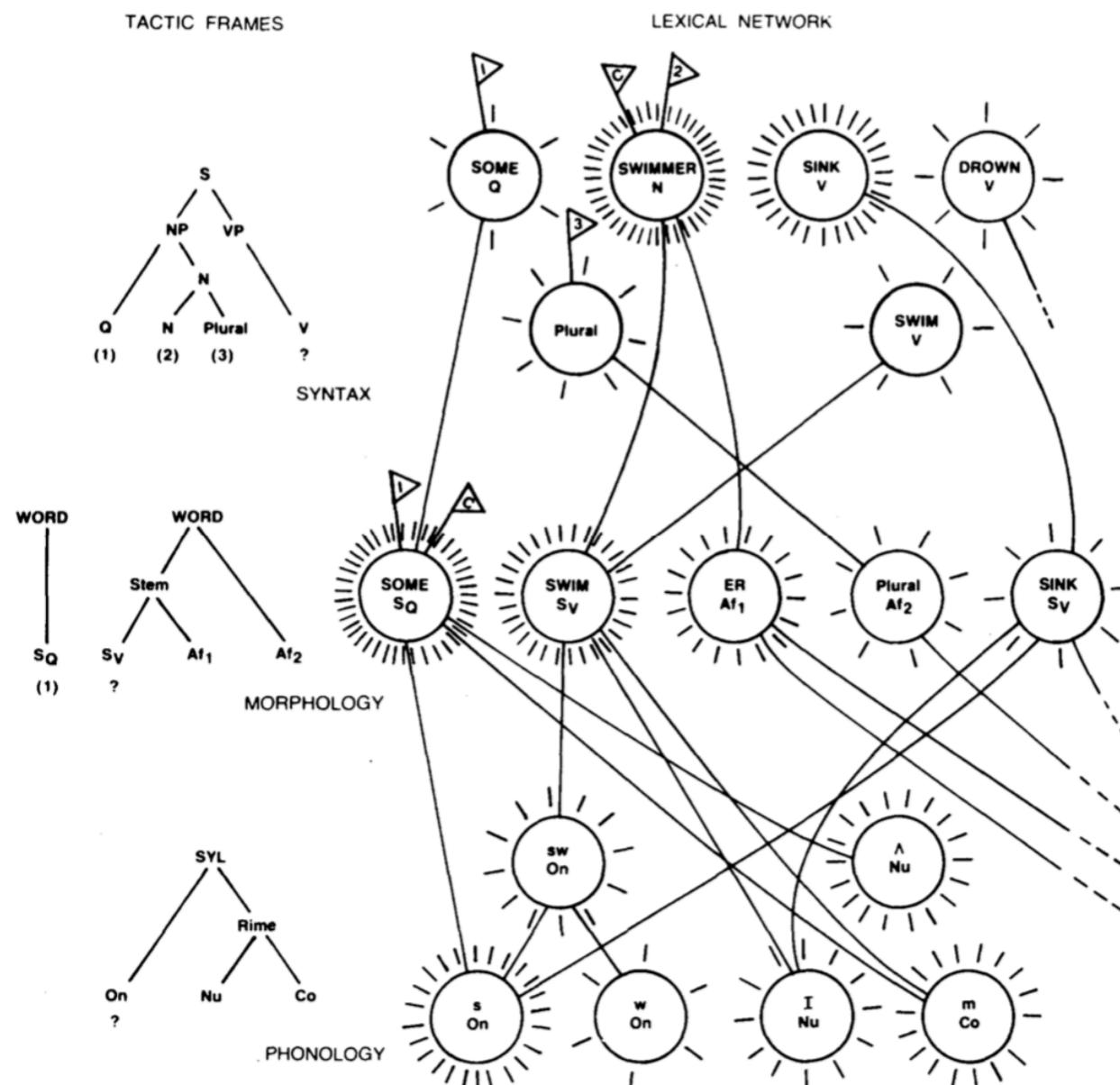
# Structural priming and abstraction in syntax?

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)

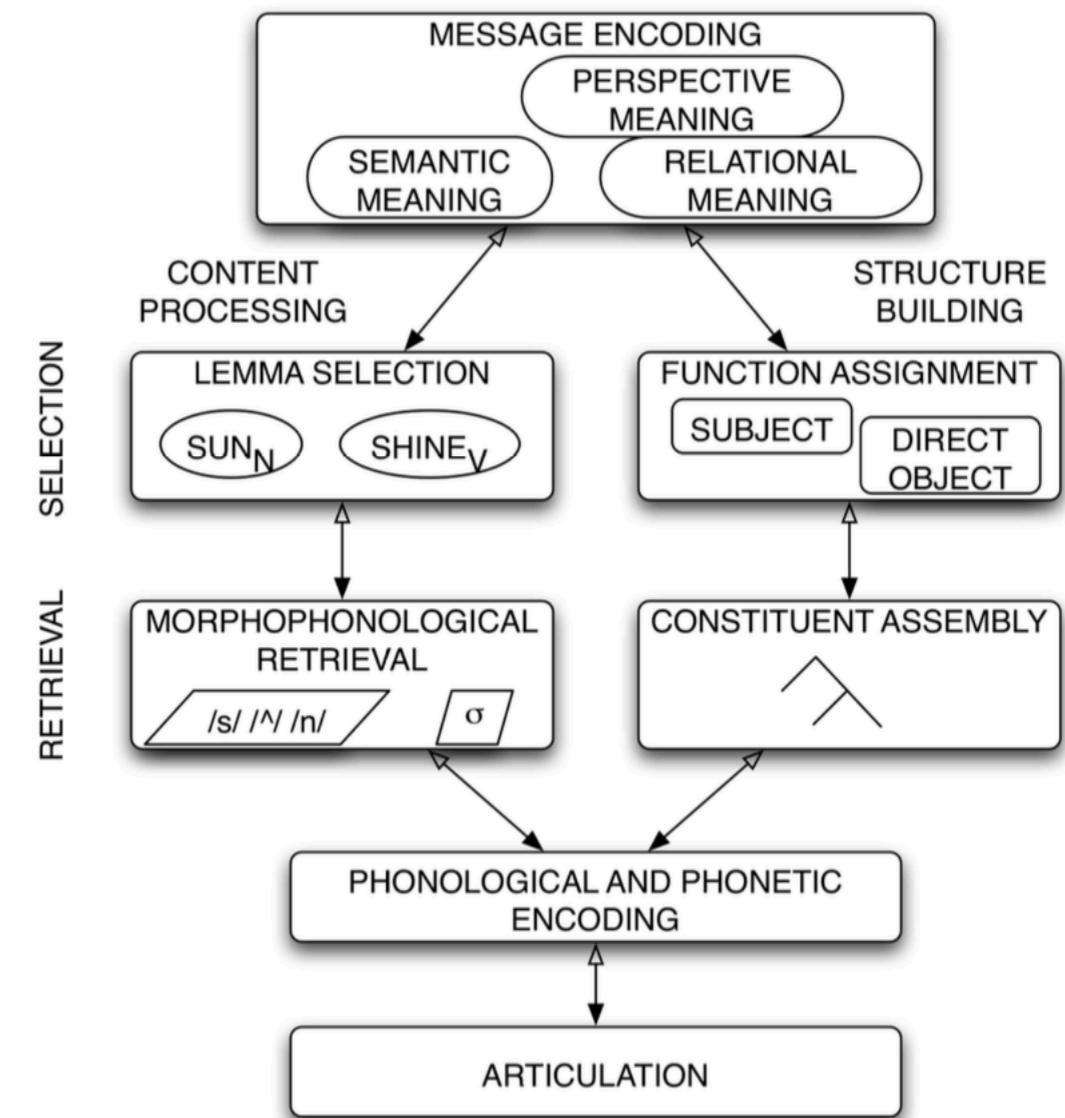


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Ferreira et al. (2019)