# Bilingual Syntactic Processing

# Major Questions

- How do bilinguals use information about the two languages in assigning initial structure to a sentence?

- How do bilinguals' different language histories influence the strategies employed during real-time sentence processing? (e.g. *language transfer*)

- Does language comprehension in bilinguals differ qualitatively from that of native comprehenders when faced with phrase structure violations, or is there only quantitative difference?

# Syntax

*Is the L1 and L2 syntax shared or separate?*

Syntactic priming experiments (w/ monolinguals)


When the participant is asked to describe this picture –

the participant is more likely to produce a passive sentence than an active sentence if this production was preceded by production of passive sentences.

# Syntactic Priming Experiments

Picture trial (filler)

Picture trial (filler)

Sentence trial (filler)

Sentence trial (prime)

Auditory sentence presentation:
*'The boat carried five people'*

Speaker repeats *'The boat carried five people'*
and makes recognition decision (*'No'*)

Picture trial (target)

Experimenter exposes slide depicting target event:

Speaker describes depicted event (e.g. *'The alarm clock awakened the boy'*)
and makes recognition decision (*'No'*)

Picture trial (filler)

Sentence trial (filler)

Pickering & Branigan (1999)

## Syntactic priming in bilinguals

*Is the L1 and L2 syntax shared or separate?*

Syntactic priming experiments (w/ bilinguals)

Hartsuiker et al. (2004)

Spanish-English bilinguals were also more likely to produce passive sentences in English, if it was preceded by Spanish passive sentences.

**Juana fue vista por varias personas.**
*Juana was seen by several people.*

→ But, Spanish and English passive sentences are structurally similar.
→ Is this possible with two languages that are not structurally similar?

## Syntactic priming in bilinguals

Loebell & Bock (2003)

Found syntactic priming in German-English bilinguals –

1)for dative sentences
2)but not for active and passive sentences.

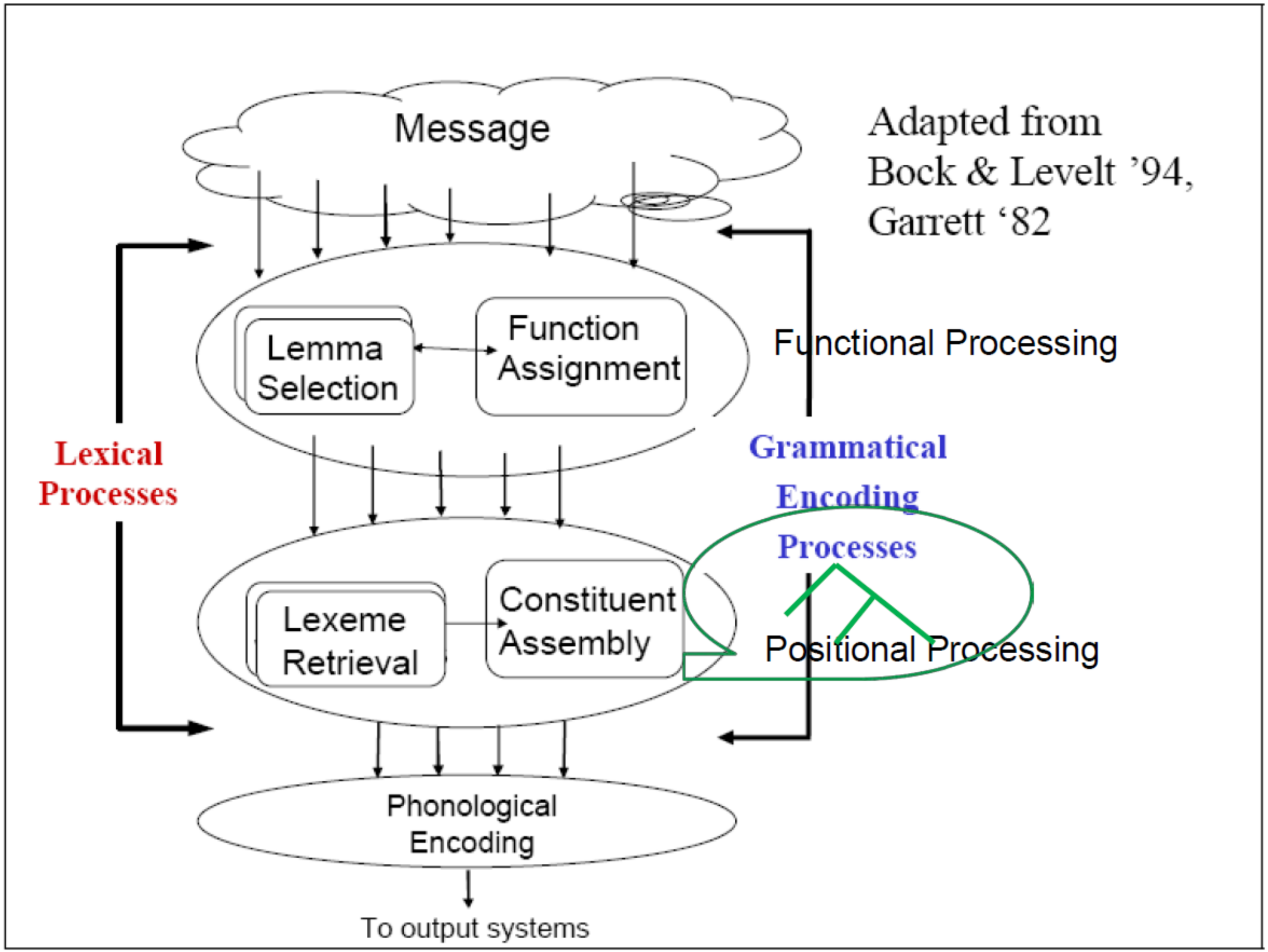
*Prepositional-object*

The girl bought a newspaper for the blind woman.
Das Madchen kaufte eine Zeitung fur die blinde Frau.

*Double-object*

The girl bought the blind woman a newspaper.
Das Madchen kaufte der blinde Frau eine Zeitung.

→ Dative sentences (prepositional-object constructions and double-object constructions are similar in these two languages, but active and passive sentences are not. (*Note:* In German, main verbs occur at the end.)


Message
Adapted from
Bock & Levelt '94,
Garrett '82
Lemma
Selection
Function
Assignment
Functional Processing
Lexical
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Encoding
Processes
Lexeme
Retrieval
Constituent
Assembly
Positional Processing
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Encoding
To output systems

## Syntactic priming in bilinguals

Hatsuiker et al. (2004)

Found syntactic priming for passive sentences in Spanish-English bilinguals.

Loebell & Bock (2003)

Found syntactic priming in German-English bilinguals for dative sentences (which are structurally similar at the surface level), but not for active and passive sentences (which are not structurally similar at the surface level).

➔ *So, is it dependent on structural configuration similarity?*

## Syntactic priming in bilinguals

Bernolet et al. (2007)

Tested syntactic priming between Dutch-German and Dutch-English bilinguals with relative clauses.

10a. the red shark (AN-structure, English)
10b. de rode haai (AN-structure, Dutch)
10c. der rote Hai (AN-structure, German)
11a. the shark that is red (RC-structure, English)
11b. de haai die rood is (RC-structure, Dutch)
11c. der Hai der rot ist (RC-structure, German)

Showed syntactic priming –

1) between Dutch and German (both have verb-final RCs)
2) but not between Dutch and English (word order is different)

→ *Surface-level word-order repetition is necessary?*

**Before we continue…**

The structural similarity group posit that structural similarity is important because –

*The wealthy widow gave her Mercedes <u>to the church</u>.*

*The wealthy widow drove her Mercedes <u>to the church</u>.*

prime one another.

## Syntactic priming in bilinguals

Shin & Christianson (2009)

Tested whether there is syntactic priming in Korean-English bilinguals with dative structure.

| | | | | | |
|---|---|---|---|---|---|
| (1) | a. | Mary-ka | John-eykey | chayk-ul | cwu-ess-ta[1] |
| Postpositional dative | | Mary-NOM | John-to[2] | book-ACC | gave-PAST-DECL |
| | b. | Mary-ka | John-ul | chayk-ul | cwu-ess-ta |
| Double-object dative | | Mary-NOM | John-ACC | book-ACC | gave-PAST-DECL |
| | c. | Mary-ka | chayk-ul | John-eykey | cwu-ess-ta |
| Scrambled postpositional dative | | Mary-NOM | book-ACC | John-to | gave-PAST-DECL |

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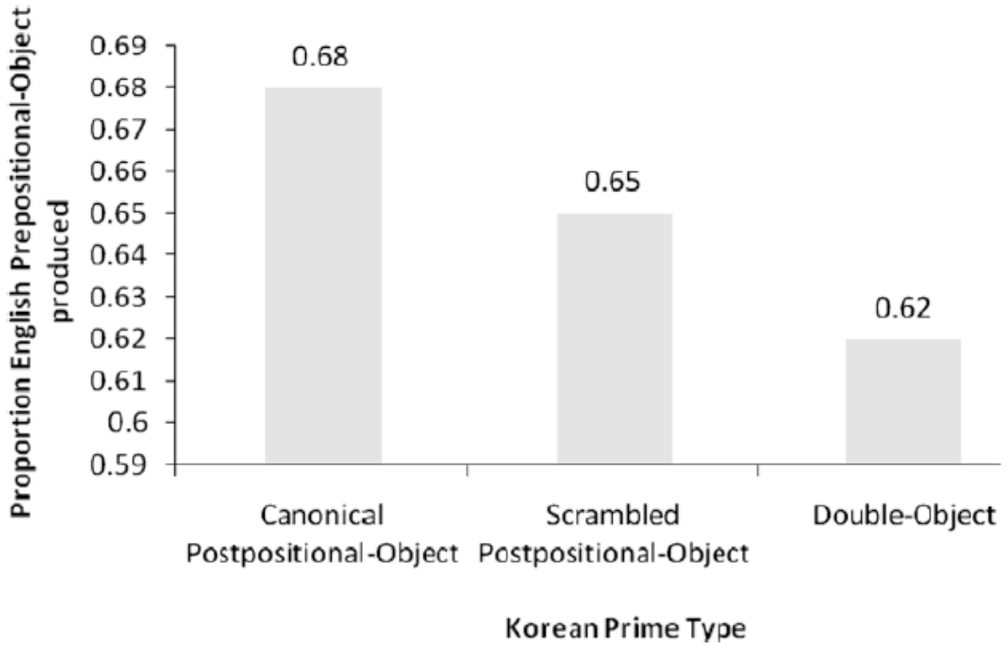
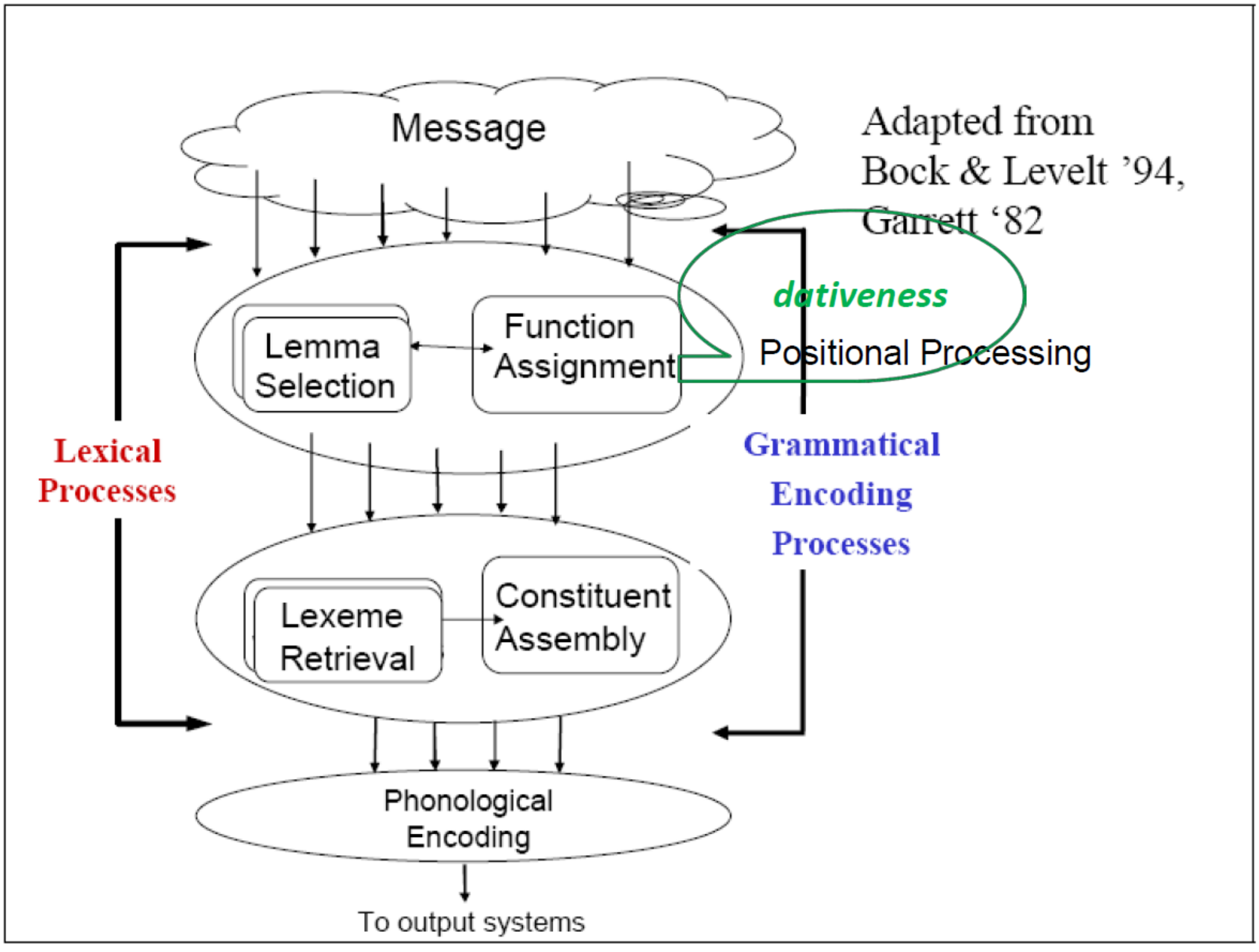



→ They found syntactic priming. If they receive a Korean postpositional dative prime, then they produced an English prepositional dative sentence.
→ *So, is syntax shared, or the meaning that is shared?*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# Syntactic priming in bilinguals

- **Song & Do** (2018)
  - In addition to functional-level vs. word-order level, can you get deep-structure level configuration?
  - By testing subject-to-object raising construction.
  - Both English and Korean goes through the same process.
  - However, is the deep-structure the same? English is SVO (so the verb occurs relatively early in the sentence), while Korean is SOV (the verb occurs at the end of the sentence).

(8) English subject-to-object raising construction (O'Grady, 2008, p. 232)

a. Without subject-to-object raising
Mary believes [(that) he is trustworthy].

b. With subject-to-object raising.
Mary believes him [ _ to be trustworthy].

(9) Korean subject-to-object raising construction (O'Grady, 2008, p. 234)

a. Without subject-to-object raising
John-i [Yengmi-ka yeyppu-ta-ko]
John-NOM Yengmi-NOM pretty-DECL-COMP [6]
sayngkak-hay-ss-ta.
thought-do-PST-DECL
'John thought that Yengmi was pretty.'

b. With subject-to-object raising
John-i Yengmi-lul [ _ yeyppu-ta-ko]
John-NOM Yengmi-ACC pretty-DECL-COMP
sayngkak-hay-ss-ta.
thought-do-PST-DECL
'John thought Yengmi to be pretty.'

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  - In addition to functional-level vs. word-order level, can you get deep-structure level configuration?
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Table 1. *Example of Experimental Item Sets.*

| | Priming Conditions | Example Sentences/Fragments |
|---|---|---|
| Prime sentences (English) | 1. Non-STOR & Noun (NS-N) | Michael believed that Ted was creative. |
| | 2. STOR & Noun (S-N) | Michael believed Ted to be creative. |
| | 3. Non-STOR & Pronoun (NS-P) | Michael believed that he was creative. |
| | 4. STOR & Pronoun (S-P) | Michael believed him to be creative. |
| | 5. Baseline | Michael woke up and smiled. |
| Target fragment (Korean) | N/A | 사람들이 (메리, 우아하다, 생각하다).<br>people-NOM (Mary, elegant-DECL, think-DECL) |

# Syntactic priming in bilinguals

- **Song & Do** (2018)
  - In addition to functional-level vs. word-order level, can you get deep-structure level configuration?
  - By testing subject-to-object raising construction.

- So shared syntax?
- But, what does this mean?

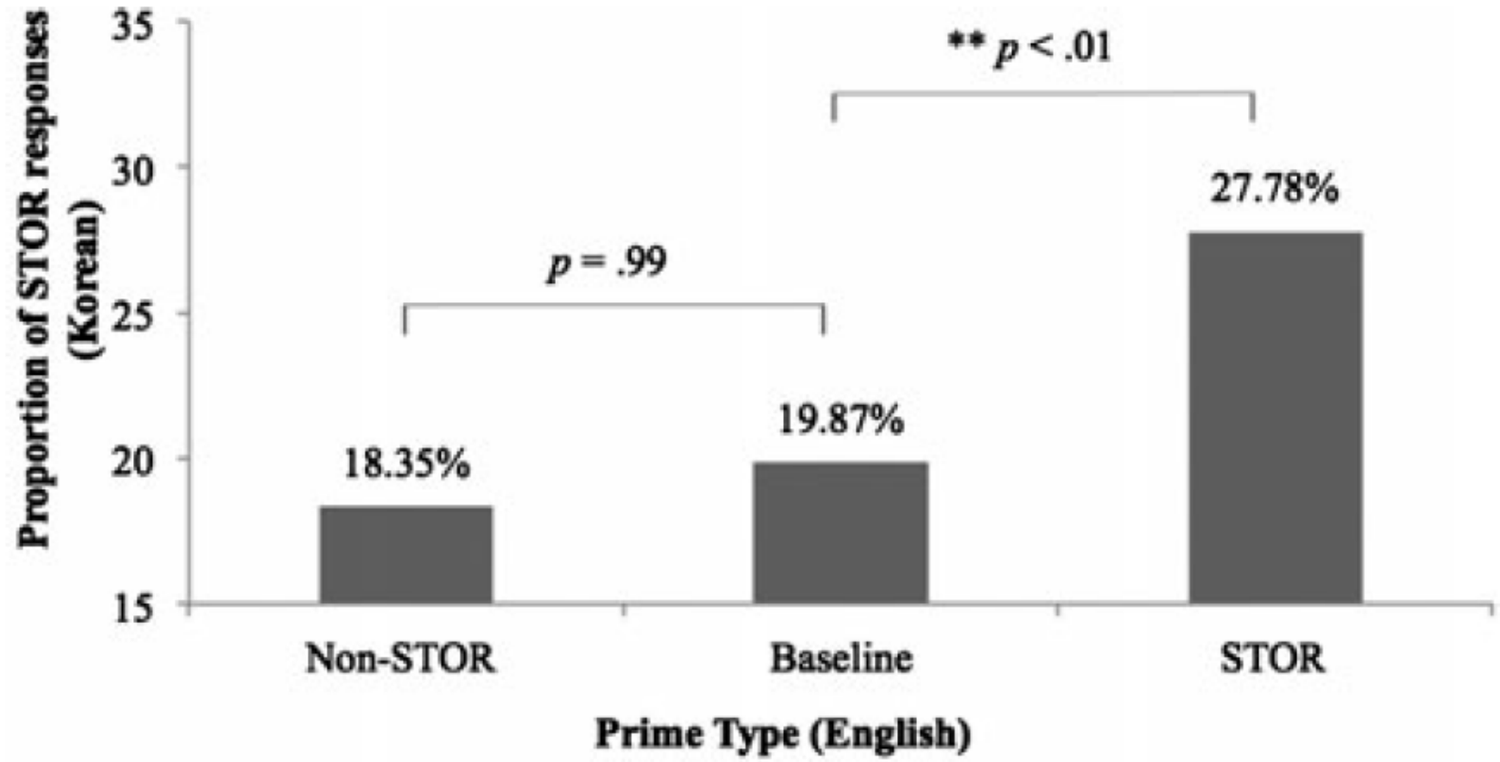


Figure 1. Proportions of STOR sentences produced in the three priming conditions.

# Other factors in bilingual syntactic processing

- Transfer effects
  - Structural frequency
  - Structural similarity and differences
- L2 proficiency
- Working memory

# Transfer effects

- **Historically, L1 effects on L2 were investigated.**
  - *The son of the actress who shot **herself** on the set was under investigation.*
  - *The son of the actress who shot **himself** on the set was under investigation.*

- In RC attachment sentences, native English readers prefer low attachment (1st sentence) while native Spanish readers prefer high attachment (2nd sentence)

- **Fernandez (1995)** found that Spanish-English bilinguals prefer high attachment, while English -Spanish bilinguals prefer low attachment.

- **Dussias (1998)**, however, found that English-Spanish bilinguals showed no preference, while Spanish-English bilinguals showed low attachment preference in both languages. **L2 to L1 transfer?**

- Indeed, **Dussias & Sagarra (2007)** showed that Spanish-English bilinguals in an L1 environment preferred L1 solution, while S-E bilinguals in an L2 environment preferred L2 solution in their L1.

## So, the understanding in the field was that —

- L2 sentence comprehension is different from L1 sentence comprehension?
  - **Performance deficit**: generally slower, less accurate performance
  - **Differences in interpretive preferences** (e.g. differences in attachment preferences)
  - **Differences in sensitivity to certain cues** (e.g. lack of sensitivity to morpho-syntactic cues)

- And these differences were due to —
  - **Competence differences**
  - **Automatically differences**
  - **Working memory** (resource allocation) differences
  - **Interference from the L1**/competition between language systems

- **The assumption** is that the L1 and L2 parser are fundamentally the same, but that the L2 parser is subject to various "obstructions".

# However,

- An alternative assumption to account for these parsing differences:
    - What if the differences between the L1 and L2 sentence comprehension are not due to these “obstructions”, but rather to fundamental differences between the L1 and L2 parser?

- **Shallow Structure Hypothesis (SSH)**
    - **Non-native speakers** do not computer detailed syntactic structure, but rather rely on plausibility and lexico-semantic information during online L2 sentence comprehension.

- Clahsen & Felser (2006) have proposed that non-native speakers, at even the highest proficiency levels, comprehend L2 sentences in a fundamentally different manner from native speakers.

- *What do you think?*

**Witzel et al. (2012)** tested —

- Relative Clause Attachment

  a. **low attachment** *The son of the actress who shot **herself** on the set was under investigation.*

  b. **high attachment** *The son of the actress who shot **himself** on the set was under investigation.*

- Adverb Attachment

  a. **low attachment** *Jack will meet the friend he phoned yesterday but he doesn't want to.*

  b. **high attachment** *Jack will meet the friend he phoned tomorrow, but he doesn't want to.*

- Closure

  a. **unambiguous(comma)** *The nurse examined the mother, and the child played quietly in the corner.*

  b. **temporarily ambiguous** *The nurse examined the mother and the child played quietly in the corner.*

## Witzel et al. (2012)

Predictions were that -

- Native speakers will show some kind of syntactic bias

    - This is because native speakers use (hierarchical) syntactic information as they read through the sentence.

<u>The question is, however, what about non-native speakers?</u>

- According to the SSH, non-native speakers will NOT show any syntactic bias because they are parsing the sentence in a shallow manner.

- If non-native speakers uses (hierarchical) syntactic information, then they will show some kind of bias as they read through the sentence. (BUT this bias may be different from native speakers.)

## Witzel et al. (2012)

## Results

- Relative Clause Attachment
  - NSs: Low attachment bias  NNSs: High attachment bias
- Adverb Attachment
  - NSs/NNSs: Low attachment bias
- Closure
  - NSs/NNSs: NP coordination bias

→ NNSs showed biases, indicating that they can compute rich hierarchical structure.

→ However, their biases may differ from NSs (as in RC attachment).

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→ However, their biases may differ from NSs (as in RC attachment).