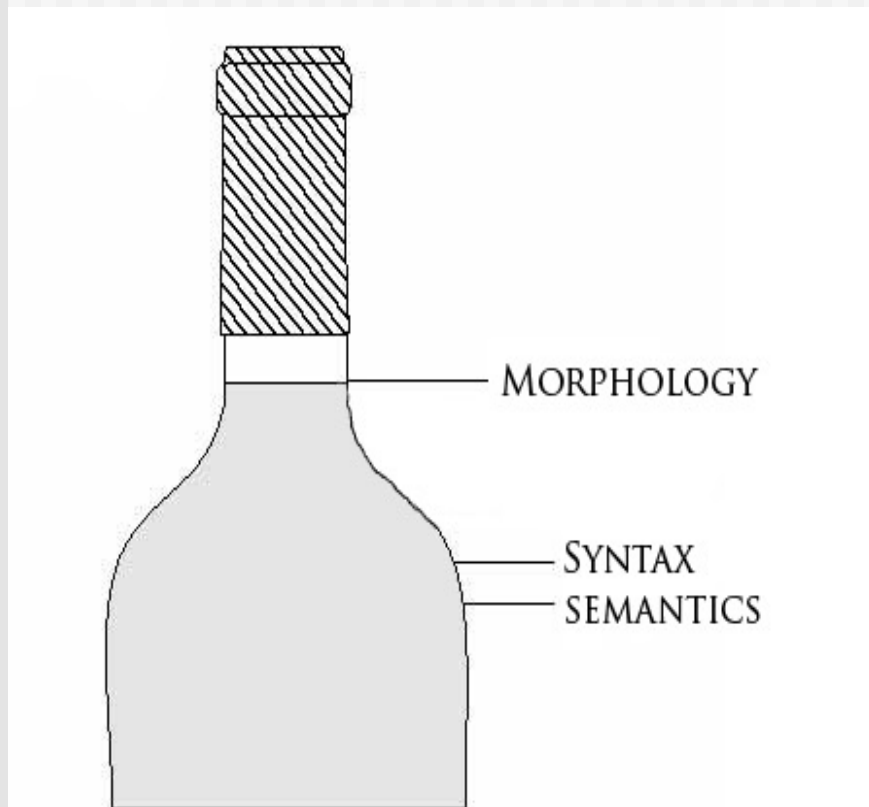


What is easy and what is hard to acquire in a second language?

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The Bottleneck Hypothesis



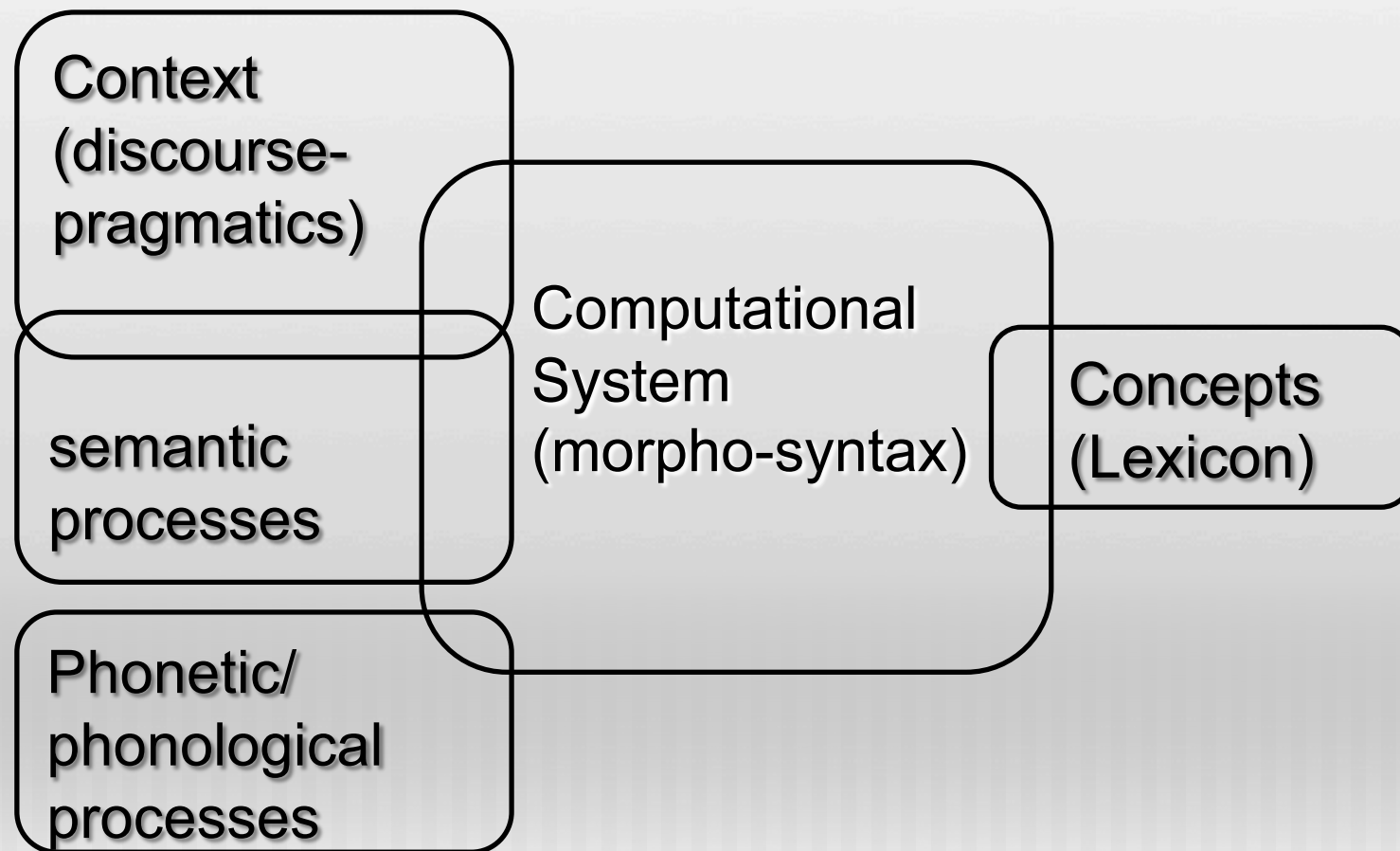
Functional morphology
is the bottleneck of L2
acquisition; acquisition
of syntax and
semantics (and maybe
even pragmatics)
flows smoothly
(Slabakova, 2006,2008)

The Bottleneck Hypothesis

Based on comparison of findings on the acquisition of:

- Inflectional morphology
- Syntax
- Syntax-semantics interface
- Syntax-context/discourse interface
- Semantics-pragmatics interface

Modular design of the language faculty (Reinhart 2006)



Linguistic Processes (Jackendoff, 2002)

- *Integrative* processes: within each module (phonology, syntax, semantics, etc)
- *Interface* processes: take as input one type of linguistic structure and output another.

Inflectional morphology in minimalist linguistic theory

- Part of the lexicon, so-called Functional Lexicon but crucial in integrative syntactic processes
- Carries information about grammatical meanings through interpretable features (e.g. tense, aspect, definiteness, etc.)
- Carries information about displacement of phrases (movement) through uninterpretable features
- Has to be learned as other lexicon entries

Infectional morphology example

My daughter often take-**s** the bus.

3 sg NP

present-3sg



Agreement

but also

Tense

Overt subject

Nominative subject

Verb stays in VP

Syntax-Before-Morphology

(White 2003)

L2 English: Suppliance in obligatory contexts (in %)

	3sg Agr on lexical verbs	Past tense	Be (aux and copula)
Haznedar 2001	46.5	25.5	89
Ionin & Wexler 2002	22	42	80.5
Lardiere 1998a,b	4.5	34.5	90

Syntax-Before-Morphology

(White 2003)

L2 English: Suppliance in obligatory contexts (in %)

	Overt subject	Nominative Case	V in VP (no raising)
Haznedar 2001	99	99.9	-
Ionin & Wexler 2002	98	-	100
Lardiere 1998a,b	98	100	100

Syntax-Before-Morphology

(White 2003)

- Syntactic (integrative) properties are acquired **BEFORE** target-like inflectional morphology, in production
- Maybe comprehension of the morphology would be different? Is comprehension easier?

Slabakova and Gajdos (2008)

Study on comprehension of German verbal morphology by 24 beginner and 18 intermediate English learners. Choose the appropriate subject task.

_____ bist ein guter Freund.

are a good friend

- Moritz
- du 'you'
- die Schüler 'the student'
- er 'he'

Slabakova and Gajdos (2008)

Percentage errors in all forms of *sein* depending on type of subject

Type of error	Beginners	Intermediate
Errors in choosing correct pronoun subjects	7.50	4.50
Errors in choosing correct NP subjects	20.18	29.80

Functional morphology is hard for some native speakers, too

Dąbrowska and Street (2006) test

comprehension of pragmatically plausible and implausible passives by English natives and L2 learners. Four subject groups (n=10 each):

Hi Ed natives (<15 yrs of education, MA/PhD)

Lo Ed natives (high-school education)

Hi Ed non-natives (MA/PhD)

Lo Ed non-natives (high-school education)

Dąbrowska and Street (2006)

Stimuli (n=20 in each condition):

The dog bit the man. (plausible)

The man bit the dog. (implausible)

The man was bitten by the dog. (plausible)

The dog was bitten by the man. (implausible)

Procedure: listen to sentences and identify the doer of the action

Accuracy Means and SD

(Dąbrowska and Street 2006)

	Plausible actives	Implausible actives	Plausible passives	Implausible passives
Hi Ed natives	100 (0)	100 (0)	100 (0)	96 (13)
Hi Ed non-natives	98 (6)	100 (0)	100 (0)	98 (6)
Lo Ed natives	98 (6)	64 (30)	98 (6)	36 (26)
Lo Ed non-natives	94 (13)	90 (11)	98 (6)	94 (10)

Conclusions

(Dąbrowska and Street 2006)

- NSs sometimes process sentences non-syntactically, relying on simple processing heuristics such as Agent-Verb-Patient template (shallow processing, ‘good-enough’ representations)
- Some NNS process syntactic cues (functional morphology) more reliably than less educated NSs

Conclusions

(Dąbrowska and Street 2006)

- Input/exposure to a particular construction is not a completely decisive factor (Lo Ed NNS did better than Lo Ed NSs on processing plausible and especially implausible passives)
- Bilingualism may actually enhance attention to formal cues in language processing

Interim conclusion on the inflectional morphology

- By definition the sticking point of acquisition because it encodes all the formal features
- Hard, not only in production but also in comprehension
- Hard for NS who do not pay attention to syntactic cues
- Harder than syntactic properties?

Relative difficulty of syntax

- Processing syntax involves universal, therefore transferable, operations, once the features encoded in functional morphology are acquired;
- Processing **complex** syntax (multiple embeddings, LD *wh*-movement) may be affected by lack of experience with specific constructions as well as working memory or processing limitations
- Is what is difficult for NNSs easy for **all** NSs?

Dąbrowska (1997)

- Tested 5 groups of NSs differing in levels of education (n=10 each): cleaners, janitors, undergrads, graduate students, and lecturers at the same UK university
- Test constructions: two types of parasitic gaps, complex NP, and *tough*-movement constructions

Dąbrowska (1997)

Sample test item (written and oral presentation):

Paul noticed that the fact that the room was tidy surprised Shona.

Comprehension questions:

What did Paul notice?

What surprised Shona?

Accuracy percent on **complex NP** comprehension (Dąbrowska 1997)

Cleaners	Janitors	Undergrads	Graduates	Lecturers
29	14	38	66	90

Chipere (2003)

- Tested complex NP comprehension, following Dąbrowska (1997), with the same experimental design.
- Subjects were grad students NSs, high-school-only NSs, and highly-educated NNSs
- Chipere found that the highly-educated NSs and NNS had the exact same behavior, while the low educated NSs had an error rate higher than 90%

Relative difficulty of syntax

- Indeed, what is difficult for NNSs is also difficult for low-educated NSs who have had little exposure to complex constructions
- After they learn the formal features, NNSs roughly pattern with their NS education peers in processing complex language
- In processing syntax, as well as in the processing of morphology, learning an L2 may afford some advantages in terms of attending to syntactic cues in processing

The syntax-semantics interface

Properties tested at the syntax-semantics interface are of two types:

- Complex syntax—simple semantics (Dekydtspotter, Sprouse and colleagues)
- Simple syntax—complex semantics (Gabriele, Garavito, Ionin, Montrul, Rothman, Slabakova, a.o.)

Both represent Poverty of the Stimulus phenomena (no evidence in the input)

Simple syntax — complex semantics

- Learning situations in which some meanings are denoted by seemingly similar morphemes.
E.g. *English* past simple and past progressive
Spanish preterit and imperfect aspectual tenses
- Mismatch at the L1-L2 syntax-semantics interface (different meanings are encoded in the seemingly similar morphemes)

Simple syntax — complex semantics

Guillermo **robaba** en la calle. (habitual)

Guillermo rob-**IMP** in the street

‘Guillermo habitually robbed (people) in the street.’

Guillermo **robó** en la calle. (one-time event)

Guillermo rob-**PRET** in the street

‘Guillermo robbed (someone) in the street.’

Felix **robbed** (people) in the street. (habitual)

Felix **robbed** a person in the street. (one-time event)

English simple present tense

(Slabakova 2003)

The English simple tense cannot denote ongoing events.

**She eats an apple right now.* (#ongoing event)

She is eating an apple right now. (ongoing event)

She eats an apple (every day). (habitual event)

With stative predicates, however, the ongoing reading of the English present is possible.

Mike is lazy. (characteristic state)

Mike is being lazy today. (temporary state)

English bare infinitive

(Slabakova 2003)

The English bare infinitive denotes not only the process part of an event but includes the completion of that event

I saw Mary **cross** the street. (completion entailed)

I saw Mary **crossing** the street.

(no completion entailed)

Explanation: bare verbs are marked with a feature [Perfective] in the lexicon, because English inflectional morphology is impoverished.

Bulgarian present tense

(Slabakova 2003)

No present progressive tense and the present simple tense is ambiguous between a habitual and an ongoing event or state.

Maria sega **jade** torta. (simultaneous event)

Maria now eat-PRES cake

‘Mary is eating a cake right now.’

Maria **jade** torta vseki den. (habitual activity)

Maria eat-PRES cake every day

‘Mary eats cake every day.’

Bulgarian present tense

(Slabakova 2003)

This is true of stative predicates as well, ambiguous between a characteristic and a temporary state.

Maria **ləže**. (characteristic state)

Maria lies-present

‘Mary is a liar.’

Maria v momenta **ləže**. (temporary state)

Maria at this moment lies-present

‘Mary is lying (at the moment).’

Bulgarian infinitives (Slabakova 2003)

Bulgarian verbs do not need to be marked [Perfective] in the lexicon. They are amply marked with person, number, and tense endings. Consequently, Bulgarian equivalents to bare infinitives do not entail completion of the event.

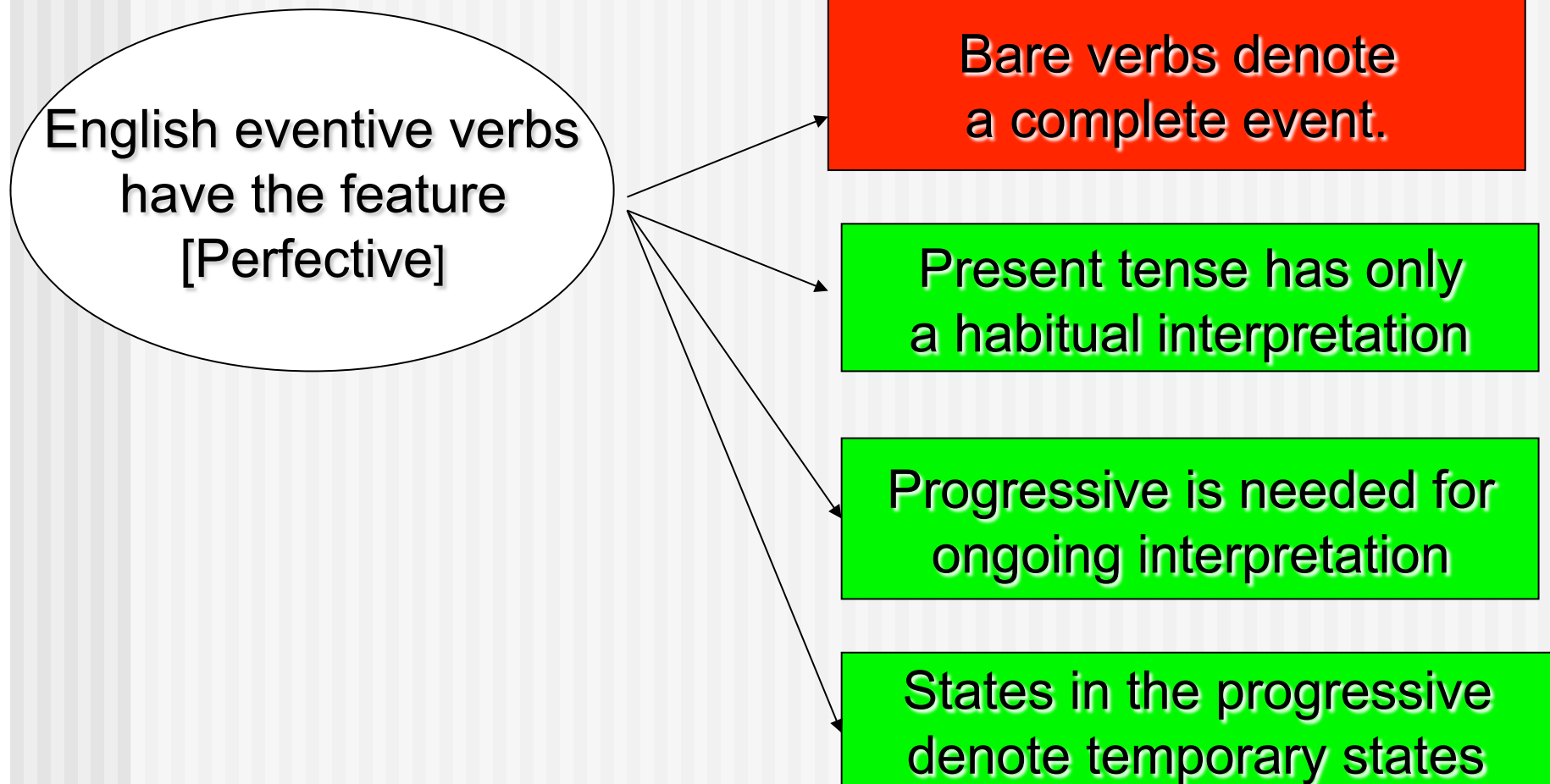
Ivan vidja Maria **da presiča** ulicata.

Ivan saw Maria to cross street-DET

‘John saw Mary **crossing/*cross** the street.’

(no completion entailed)

Learning Task (Slabakova 2003)



Experiment (Slabakova 2003)

- 112 Bulgarian-speaking learners of English and 24 native speakers
- 3 proficiency levels: low intermediate, high intermediate, and advanced
- A production task for ascertaining knowledge of inflectional morphology
- A truth value judgment task for checking knowledge of interpretation

Experiment (Slabakova 2003)

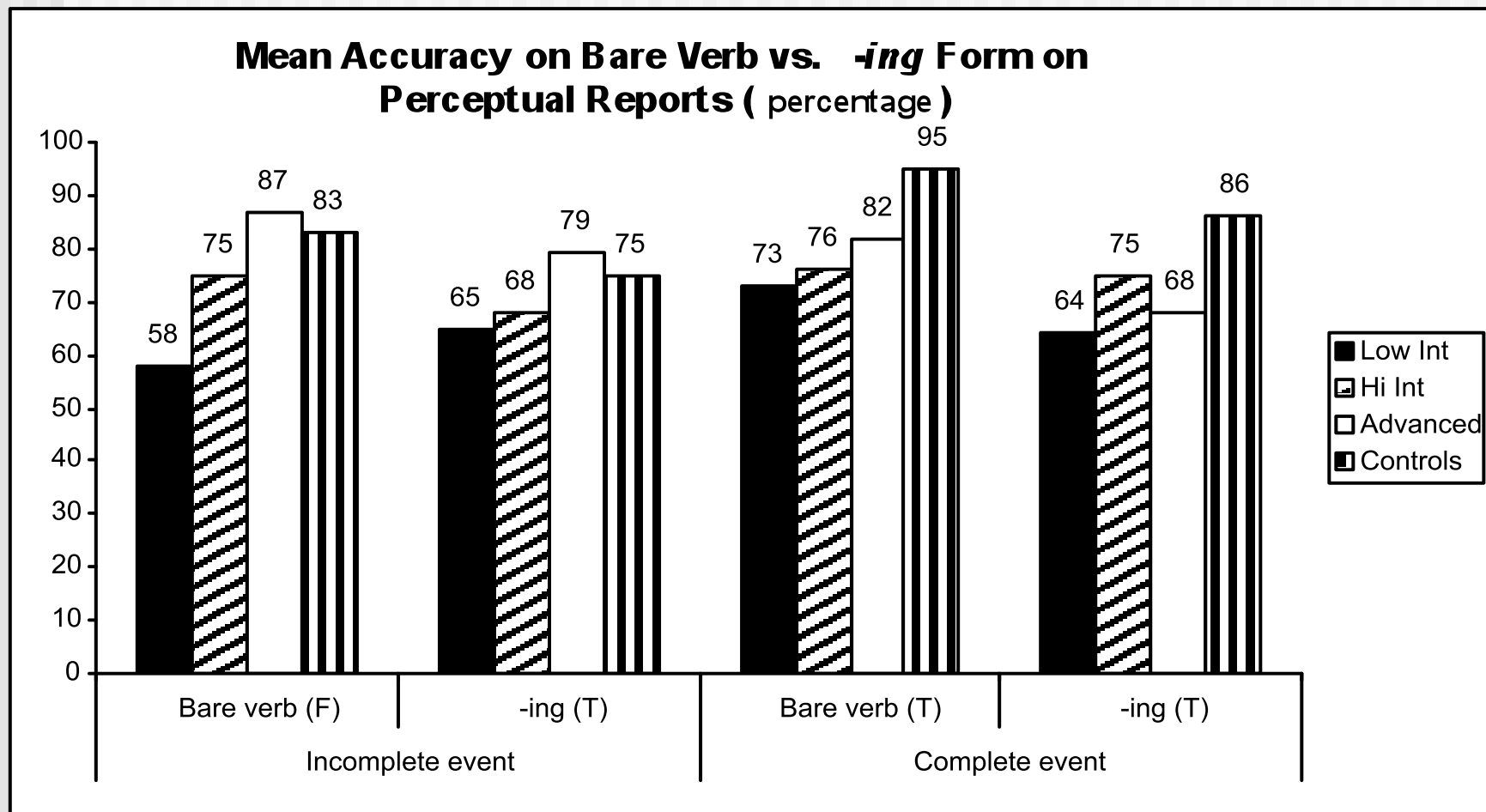
A quadruple testing completed interpretation of English bare forms:

Matt had an enormous appetite. He was one of those people who could eat a whole cake at one sitting. But these days he is much more careful what he eats. For example, yesterday he bought a chocolate and vanilla ice cream cake, but ate only half of it after dinner. I know, because I was there with him.

I observed Matt eat a cake. True **False**

I observed Matt eating a cake. **True** False

Results (Slabakova 2003)



Conclusions (Slabakova 2003)

- It is **possible** to acquire semantic properties in the second language that do not come from the L1
- **All** semantic effects of the triggering inflectional property appear to be engaged at the same time.
- Any impact of instruction? **NO**

ANOVA on the data for each group, with condition as the sole factor. All groups perform equally well on all conditions.

The syntax-discourse interface

(Ivanov 2009):

Clitic-doubling (a syntactic property) is sensitive to which argument is **TOPIC** (old information, based on the current discourse)

Q: Has anybody seen Ivan?

A: Ivan **go** vidja Maria.

O-CI-V-S

Ivan him-cl. saw Maria

B:*Ivan vidja Maria

*O-V-S

‘Maria saw Ivan’

Experiment (Ivanov 2009):

Tests: a GJT and a context-sentence evaluation task: a situation described in English and a short dialogue in Bulgarian where the participants had to evaluate four options on a scale from 1 (totally unacceptable) to 5 (perfectly acceptable). Written and aural presentation of test items.

Participants: 14 intermediate and 10 advanced learners of Bulgarian, 20 native Bulgarian controls

Experiment (Ivanov 2009):

Mr. Jordanov, the manager of Doublestream Ltd., runs into the office looking for one of the company employees, Ivan. Ivan is nowhere to be seen but there are several other employees working in their cubicles. Mr. Jordanov asks them:

Q: Has anybody seen Ivan today?

A: *Ivan go vidjah tazi sutrin.* ✓ Felicity

Ivan him-cl saw-1sg this morning

'I saw Ivan in the morning.'

B: *Tazi sutrin go vidjah Ivan.* ✓ Felicity

C: *Ivan vidjah tazi sutrin.* # Felicity

D: *Tazi sutrin vidjah Ivan.* #Felicity

Mean acceptance (out of 5)

Accusative condition Ivanov (2009)

Participant group	O-CI-V-Adv √ Felicity	Adv-CI-V-O √ Felicity	O-V-Adv # Felicity	Adv-V-O # Felicity
Native Bulgarian controls	4.82	4.52	1.72	2.7
Advanced Bulgarian Learners	4.73	4.32	2.62	3.2
Intermediate Bulgarian Learners	3.7	3.33	3.79	4.41

Conclusions (Ivanov 2009):

- Knowledge of clitic-doubling cannot come from English
- The discourse requirements are not taught in Bulgarian classrooms.
- Intermediate learners as a group are not sensitive to the discourse properties of clitic-doubling
- All 9 advanced learners exhibit knowledge of syntactic as well as the discourse requirements of clitic-doubling

The semantics-pragmatics interface (Slabakova 2007, in press)

Scalar implicatures:

- (1) *Some professors are smart* → IMPLICATION
- (2) *Not all professors are smart* BUT NOT
- (3) *All professors are smart*

Logically speaking, *some* means *some and possibly all*.

For **pragmatic felicity**, *some* means *some but not all*.

The semantics-pragmatics interface (Slabakova 2007, in press)

- The learning task in L2A involves transferring the purportedly universal Scalar Implicature computation mechanism from the L1.
- Therefore, we expect L2 learners to be accurate in Scalar Implicature derivation, but that processing resources may have an impact on accuracy and speed.

The semantics-pragmatics interface (Slabakova 2007, in press)

Participants in Experiment 1

English Natives: 23 adults

Korean Natives: 30 adults, who took the same test translated in Korean

English learners (Korean native speakers): 30 advanced and 20 intermediate

The semantics-pragmatics interface (Slabakova 2007, in press)

8 universally true sentences

All elephants have trunks.

8 sentences infelicitous with *some*

Some elephants have trunks.

8 sentences felicitous with *some*

Some books have color pictures.

8 sentences false with *all*

All books have color pictures.

8 absurd fillers

All/some garages sing.

Percentage of Logical Responses across participants groups in Experiment 1

Groups	True all	False all	Felicitous some	Infelicitous some
English adults	75.5	98.9	96.7	55.4
Korean adults	88	98.5	99	61.2
L2 advanced	82	98	98	39.2
L2 intermediate	78	97	90	41.8

The semantics-pragmatics interface (Slabakova 2007, in press)

- Korean learners attribute more pragmatic interpretations to scalar implicatures without context than they do in their native Korean, and significantly more than English
- When asked to judge sentences with *some* in context, they offer pragmatic judgments around 90% of the times (Experiment 2)
- Learners observe Gricean maxims

Taking stock

- **Syntax** proper comes **before morphology** in production and comprehension (White 2003, Slabakova and Gajdos, 2008)
- **Functional morphology** is harder for low-educated NSs than NNSs (Dąbrowska and Street 2006)
- In processing **complex syntax**, low-educated NSs who have had little exposure to complex constructions may be at a disadvantage compared to NNSs (Gabrowska 1997, Chipere 2003)

Taking stock

- Once the inflectional morphology is learned, learners are aware of all its semantic consequences, taught and untaught (Slabakova 2003)
- Even at the **syntax-discourse interface**, acquisition of properties unavailable from the L1 is possible (Ivanov 2009)
- At the **semantics-pragmatics interface**, L2 learners transfer universal properties like Gricean maxims (Slabakova 2007, in press)

The Bottleneck Hypothesis

- Inflectional morphology reflects syntactic and semantic differences between languages
- Syntax proper and meaning calculation is universal
- In order to acquire syntax and meaning in a second language, the learner has to go through the inflectional morphology
- Hence, morphology is the bottleneck of acquisition

Pedagogical Implications

- Communicative approaches to language learning vs Focus on grammatical form?
- The Bottleneck Hypothesis endorses increased emphasis on practicing grammar in the classroom
- But how? Practicing the inflectional morphology in language classrooms should happen in meaningful, plausible sentences in context, where the syntactic effects and the semantic import of the morphology is absolutely transparent and non-ambiguous.

Pedagogical Implications

- Doughty (2003) discusses **classroom instruction** and weighs the case for and against it. She cites UG approaches as arguing that classroom instruction is largely unnecessary (see Long & Robinson (1998)).
- I have argued here that newer evidence and enhanced understanding of the L2 acquisition processes actually support focus on the practicing of inflectional morphology in the classroom.
- At the same time, focus on subtle properties that come from universal knowledge is (still) unnecessary.

Bottom line

- Recent generative work supports the findings of different approaches to the explicit teaching and practicing of **grammar** in the classroom: Skill Acquisition Theory (DeKeyser); Input Processing (VanPatten); Focus on Form (Doughty, Long).
- Generative work endorses a very specific type of grammar instruction: practicing of inflectional morphology in clear, unambiguous contexts

Bottom line

Practice your functional morphology!

In ample and clear context!

As in learning other lexical items,

it may be painful, but --

No pain, no gain!

References

- Clahsen, H. and C. Felser. 2006. Grammatical processing in language learners. *Applied Psycholinguistic* 27: 3-42.
- Dabrowska, E. 1997. The LAD goes to school: a cautionary tale for nativists. *Linguistics* 35, 735-766.
- Dabrowska, E. and J. Street, 2006. Individual differences in language attainment: Comprehension of passive sentences by native and non-native English speakers. *Language Sciences* 28, 604-615.
- DeKeyser, R. 2007. Skill Acquisition Theory. In *Theories in second language acquisition*, Bill VanPatten and Jessica Williams (eds.), 97-113. Mahwah, NJ: Erlbaum.
- Dekydspotter, L., R. Sprouse, and R. Thyre. 1999/2000. The Interpretation of Quantification at a Distance in English-French Interlanguage: Domain-specificity and second language acquisition." *Language Acquisition* 8: 265-320.
- Doughty, C. and J. Williams, (eds.) 1998. *Focus on form in classroom second language acquisition*. Cambridge, UK: Cambridge University Press
- Doughty, C. 2001. Cognitive underpinnings of focus on form. In *Cognition and Second Language Acquisition*, Peter Robinson (ed.), 206-257. Cambridge, UK: Cambridge University Press.
- Ferreira, F., K. Bailey, and V. Ferraro. 2002. Good enough representations in language comprehension. *Current Directions in Psychological Science*, 11: 11-15.
- Giorgi, A. and F. Pianesi. 1997. *Tense and aspect: From semantics to morphosyntax*. New York: Oxford University Press.
- Haznedar, B. 2001. The acquisition of the IP system in child L2 English. *Studies in Second Language Acquisition* 23: 1-39.
- Ionin, T. and K. Wexler. 2002. Why is 'is' easier than '-s'? Acquisition of tense/agreement morphology by child second language learners of English. *Second Language Research* 18: 95-136.
- Lardiere, Donna Lardiere 1998a. Case and tense in the 'fossilized' steady state. *Second Language Research* 14: 1-26.
- Lardiere, D. 1998b. Dissociating syntax from morphology in a divergent end-state grammar. *Second Language Research* 14: 359-375.
- Reinhart, T. 2006. *Interface Strategies*. MIT Press.

References

- Rothman, J. 2009. Pragmatic deficits with syntactic consequences? L2 pronominal subjects and the syntax-pragmatic interface. *Journal of Pragmatics*, 41, 951-973.
- Slabakova, R. 2003. Semantic Evidence for Functional Categories in Interlanguage Grammars. *Second Language Research*, 19(1): 42-75.
- Slabakova, R. 2006. Is there a Critical Period for the Acquisition of Semantics, special issue of *Second Language Research*, 22, 3, 302-338.
- Slabakova, R. 2008. *Meaning in the Second Language*, Studies in Language Acquisition Series, Berlin: Mouton de Gruyter.
- Slabakova, R. and J. Gajdos. 2008. Variable morphology in L2 Acquisition: Facts and Explanations. In *Selected Proceedings from SLRF 2007*, Melissa Bowles, Rebecca Foote and Silvia Perpiñán (Eds.), Cascadilla Proceedings Project.
- VanPatten, B. 2007. Input processing in adult second language acquisition. In *Theories in second language acquisition*, Bill VanPatten and Jessica Williams (eds.), 115-135. Mahwah, NJ: Lawrence Erlbaum Associates.
- White, L. 2003. *Second language acquisition and Universal Grammar*. Cambridge University Press.