

**“Class, I’ve got a lot of material to cover,
so to save time I won’t be using vowels today.
Nw lts bgn, pls trn t pg 122.”**

Lecture 3

Intonation and information structure (Part I)

CN MSc course 'Language Acquisition', 15 March 2011

Instructor: Aoju Chen

A few words on information structure

- Bipartite information structures
 - New vs. old
 - Topic and focus

e.g. Vallduví and Engdahl (1996)

Defining topic and focus

- Topic:
 - the referent about which the WH-question is raised
- Focus:
 - the information required by the WH-word

Speaker A:

Look! A rabbit! The rabbit seems to be eating something.

What is the rabbit eating?

Speaker B:

The rabbit is eating grapes.



higher information value



Intonational marking of focus and topic

- *Focus*
 - Marked by acoustic prominence
 - Accentuation and post-focus deaccentuation (e.g. German, English, Dutch etc.)
 - Phrasing & post-focus dephrasing (e.g. Seoul Korean)
 - Pitch range expansion and post-focus pitch range compression (e.g. Mandarin Chinese)
 - A floating focus-marking tone & post-focus pitch range compression (e.g. Stockholm Swedish)
- *Topic* (in West Germanic languages)
 - Accented or not, depending on ...
 - activation of topical status, contrastiveness, position relative to focus
 - When accented, not necessarily with a different accent type than focus

Early production of topic-focus construction

- The most common type of successive one-word utterances in one-word and early two-word stage:
 - Door. Open (Bloom 1973)
 - Finger. Touch. (Scollon 1979)
 - *Federica acqua* 'Federica (drinks) water' (D'Odorico 2003)



P: Zeg, lijken jullie, lijken jullie op papa of mama? Wil ik eerst van jou weten.

P: Well, are you like, are you like your Dad or Mum? I'd like you to tell me first.

P: Ik kan dat misschien zelf ... Je moet zelf zien. Vind je dat je op papa of mama lijkt?

P: Maybe I can tell myself ...you should see it for yourself. Do you think you are like Dad or Mum?

C: Ik vind dat ik niet op papa en mama lijk. Want mama, die heeft, die heeft een bloes en een grijze broek

C: I think I am not like Dad and Mum. Because mum, she wears, she wears a blouse en gray pants.

P: Je hebt een trui

P: You bear a sweater.

C: ja, en papa die heeft, die heeft een groene trui en een groene broek.

C: Yes, and Dad, he wears, he wears a green sweater en green pants.

The development to be described



2 yrs

Wat gaat het paard eten?

'What is the horse going to eat?'

Appel eten

'apple eat'



3 yrs

Wat is dat voor een koe?

'What kind of cow is it?'

Een jonge koe

'A young cow'



4 yrs

Wat schildert de paashaas?

'What is the Easter-bunny painting?'

De paashaas schildert de voetbal

"The Easter-bunny is painting the football"



7 yrs

Wat schildert de paashaas?

'What is the Easter-bunny painting?'

De paashaas schildert de voetbal

'The Easter-bunny is painting the football'



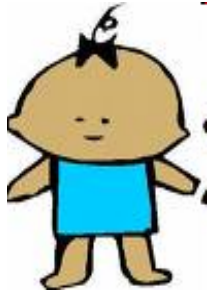
adult



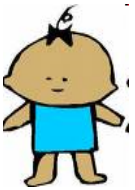
Learning phonological marking

(use of accent placement and accent type)

- Study 1: 2-year-olds (two-word stage)
- Study 2: 4- to 5-year-olds
- Study 3: 7- to 8-year-olds

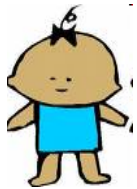


Study 1: Children at the two-word stage



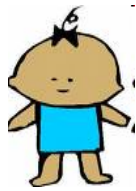
Data

- Speakers: 3 monolingual Dutch children aged 1;9 ~ 2;1 (CLPF corpus, Levelt 1994, Fikkert 1994)
- Natural play sessions at home
 - Typical activities: reading picture books & playing with toys
- Answers to WH-questions
 - Noun + Verb (N=21)
 - Particle + Verb (N=26)
 - e.g. dicht doen 'closed do'



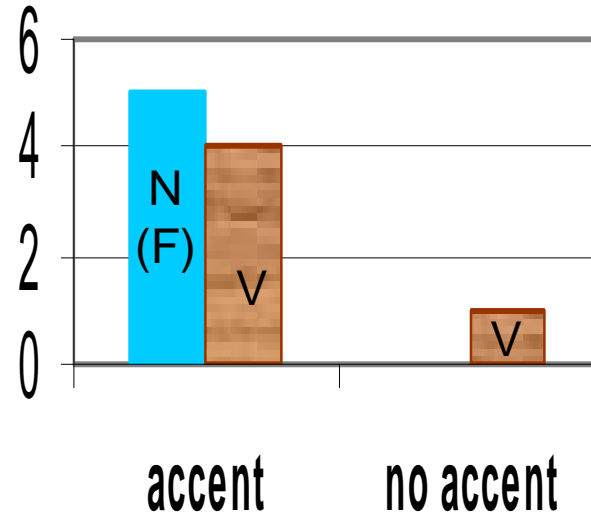
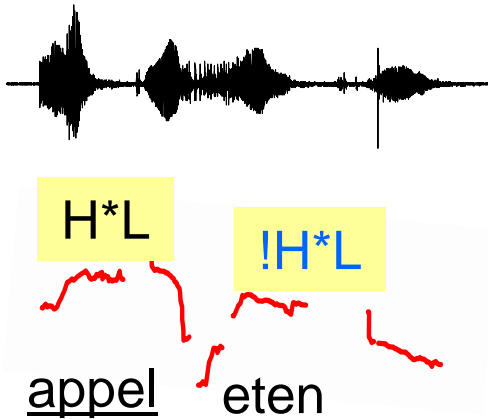
Intonational annotation

- Transcription of Dutch Intonation (ToDI, Gussenhoven 2005) as the reference point
- Intonation annotated out of context & blind to the context by two labellers
- Inter-rater agreement (>90%)

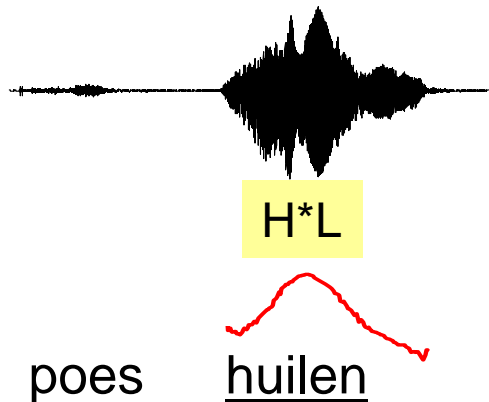


Results (1)

- Noun + Verb: Appel eten 'apple eat'



- Noun + Verb: Poes huilen 'cat cry'

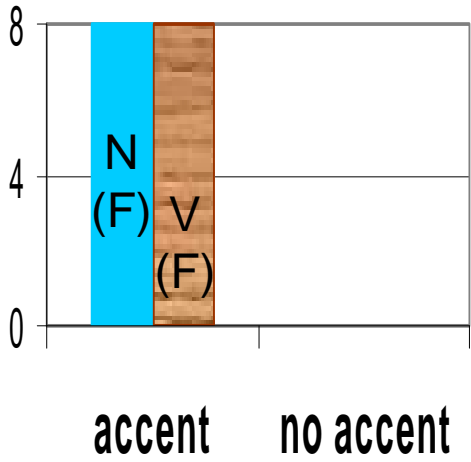
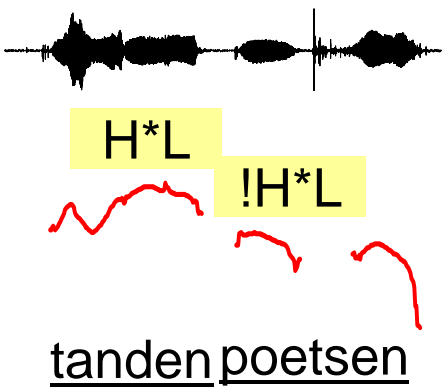




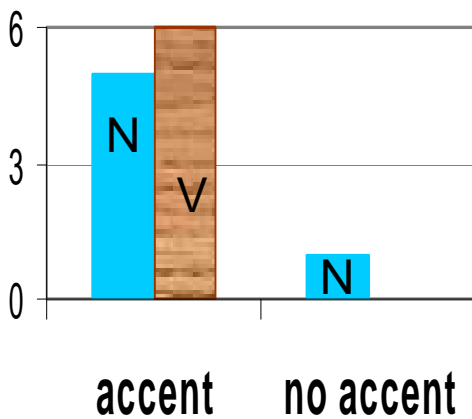
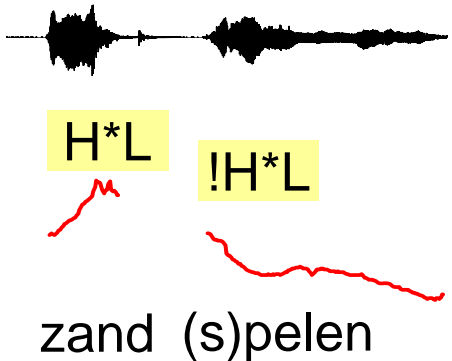
Results (2)

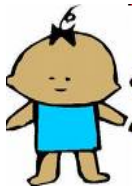


- Noun + Verb: tanden poetsen 'teeth clean'



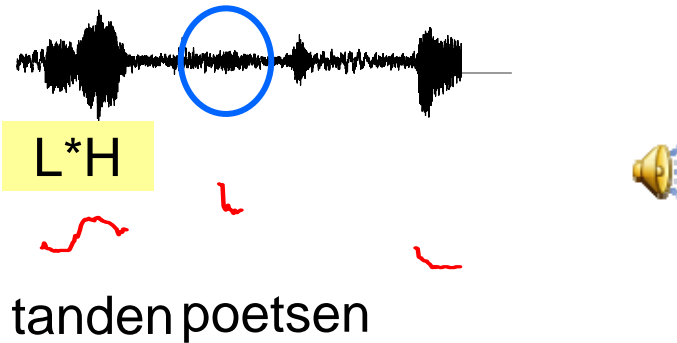
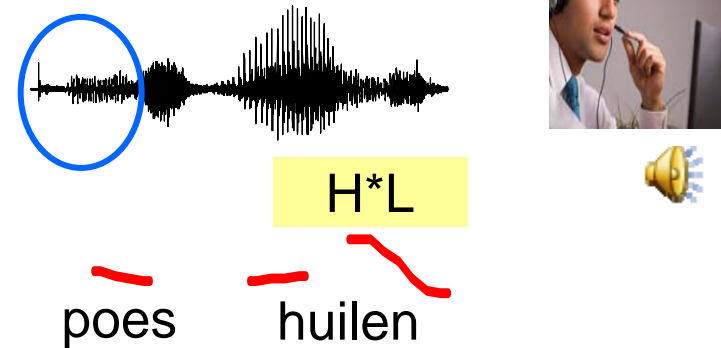
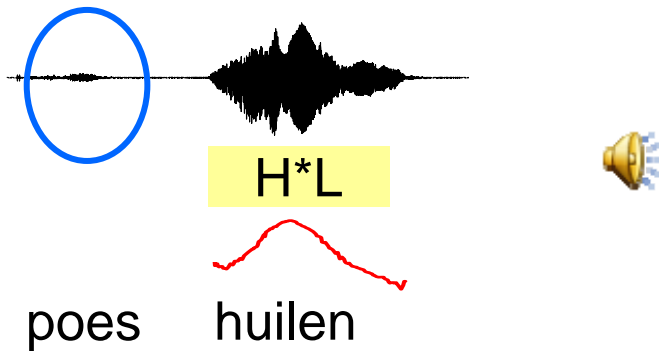
- Noun + Verb: zand spellen 'sand play'



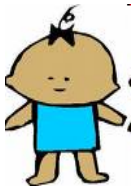


Results (3)

- Immature pitch-control system -> difficulty in lowering pitch over the domain of a word
 - Not accenting: devoicing



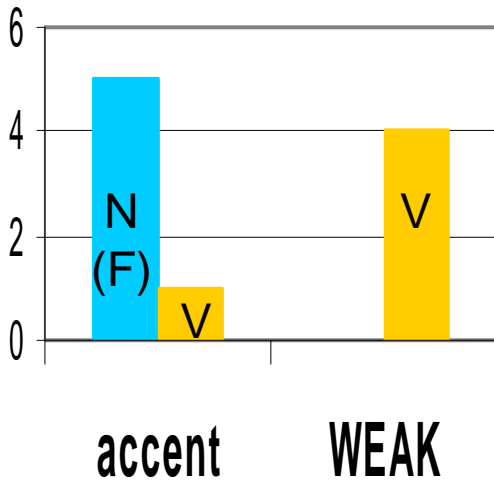
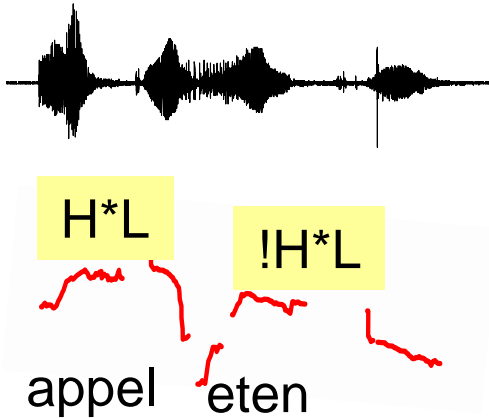
- !H*L: young children's attempt to deaccent



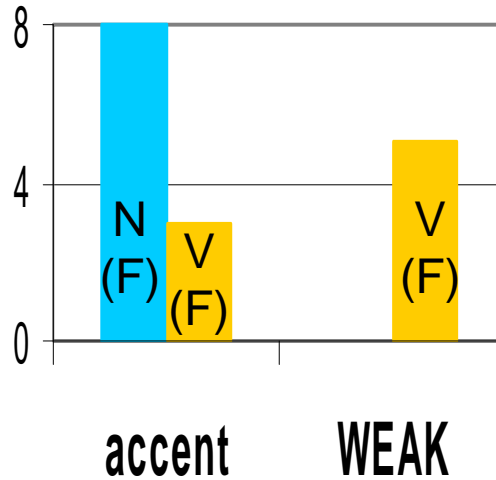
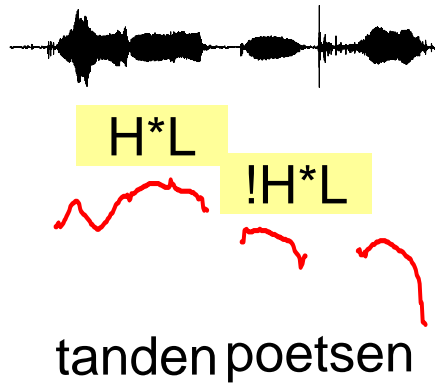
Results (4)

- Accent vs. Weak intonation (!H*L, no accent)

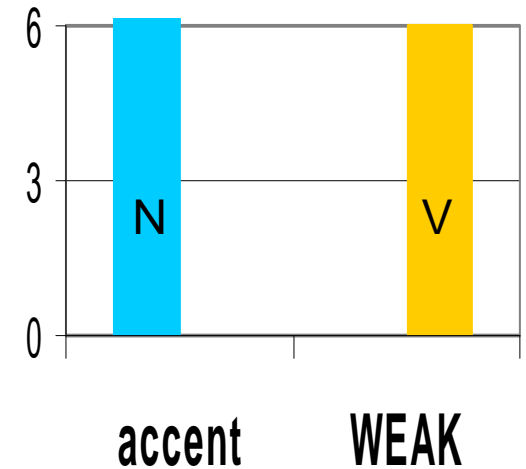
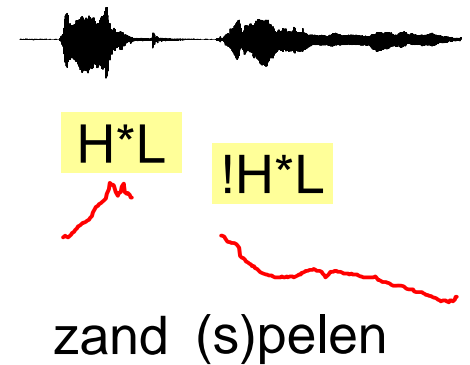
Noun + Verb



Noun + Verb



Noun + Verb





Results (5)

- Systematic use of intonation in late two-word stage
 - Focus marked by accentuation
 - Non-focus marked by weak intonation (!H*L & no accent):
 - !H*L used like no accent (difficulty in pitch control)
 - Devoicing instead of deaccenting
- Same patterns in Dutch 3-yr-olds (Chen & Fikkert 2007b)
 - [Adjective]_{focus} + Noun
(e.g. What kind of fish is it? (It's a) weird fish)
 - More deaccenting than younger children
- Issues for further studies
 - two-word utterances with focus on the second word (to test the weak-accent theory)
 - Imitation studies (to get more evidence on devoicing as a cue to topic)

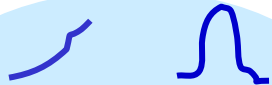


Study 2: 4- to 5-year-olds

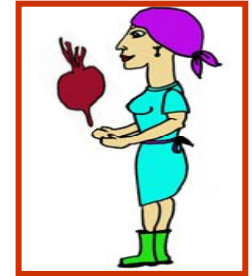
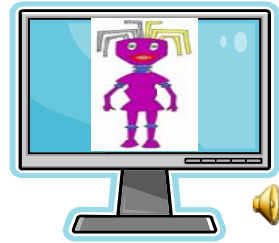
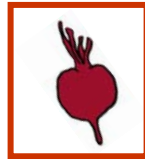


Method

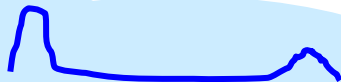
- A picture matching game
- 4- to 5-year-olds (N=12, mean age 5;1)
- Adults (N=9)



Kijk! Een biet!
Look! A beet!



Experimenter



Wie eet een biet?
Who eats the beet?







Method (cont'd)

- 36 SVO answer sentences

questions about subject

Wie eet een biet?

De poetsvrouw eet een biet



Focus



Topic

questions about object

Wat pakt de poetsvrouw?

De poetsvrouw pakt een vaas.



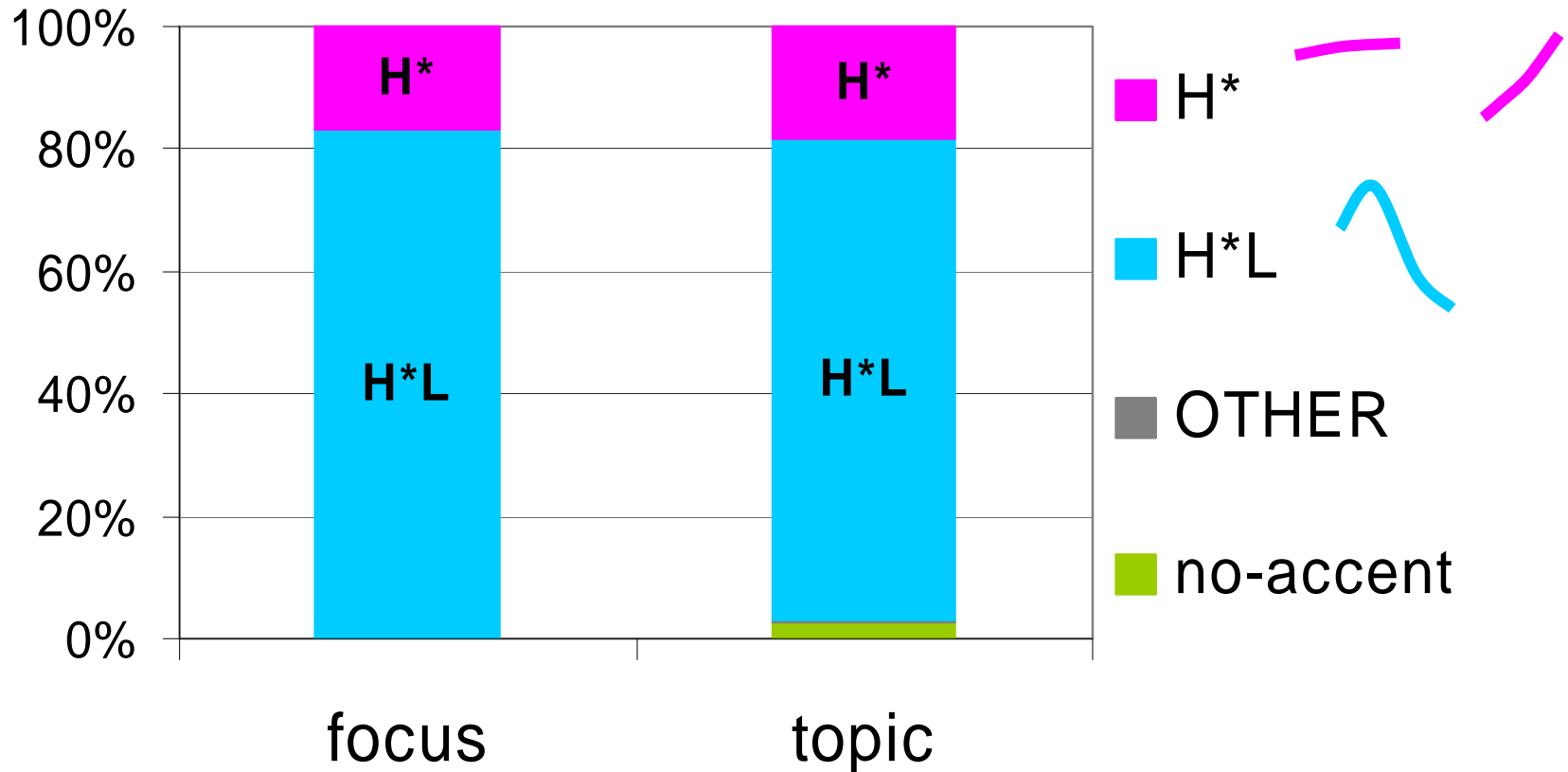
Topic



Focus

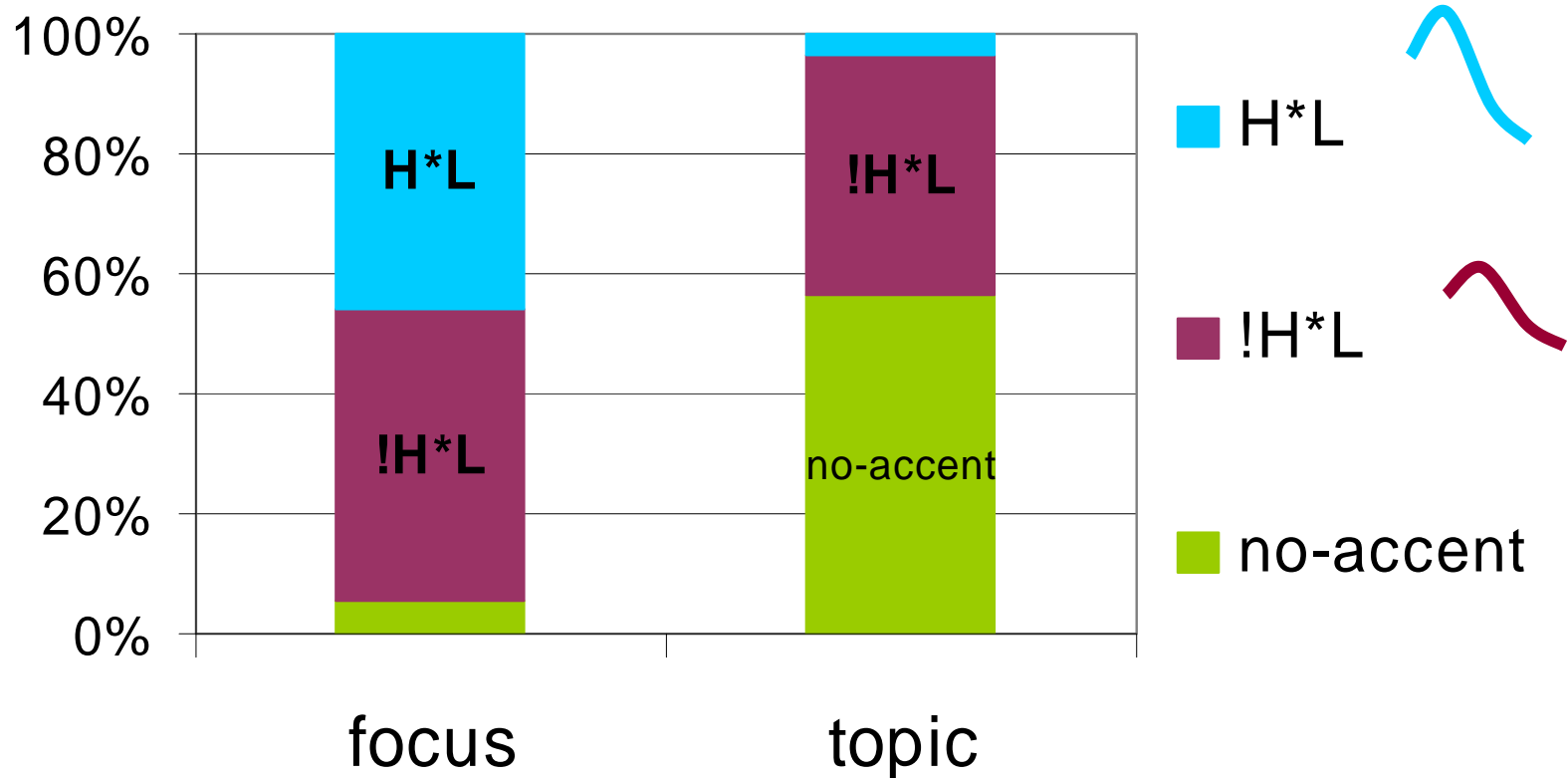
- Annotated for intonation following ToDI
- Multinomial logistic regression analysis

Results: adults_sentence initial



- No effect of information structure on choice of intonation pattern
 - Focus and topic: H*L, H*

Results: adults_sentence final



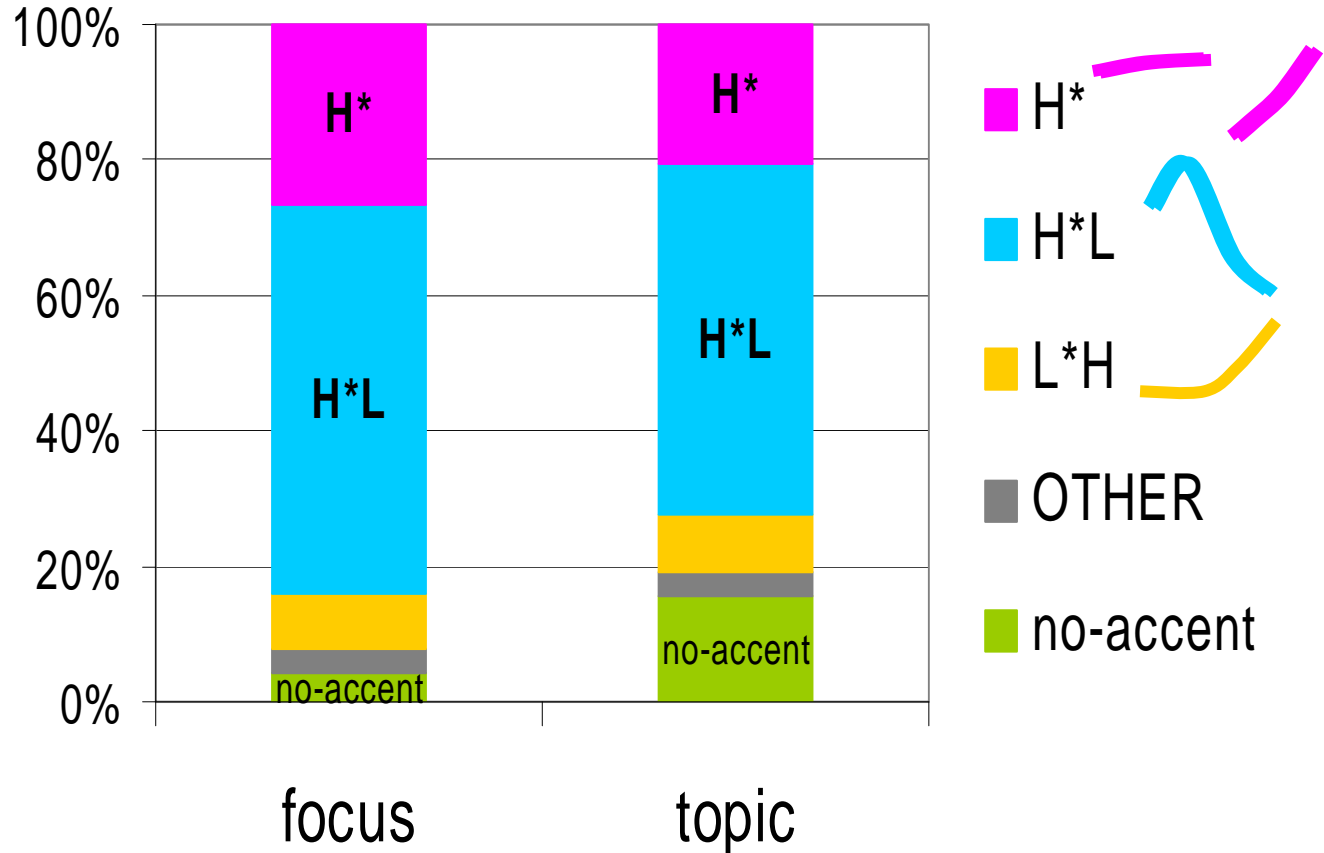
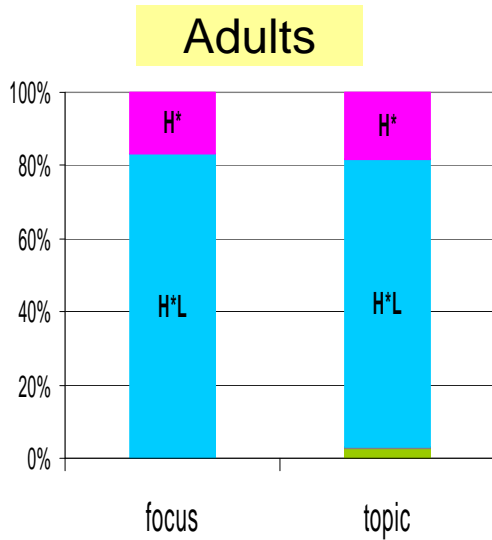
- Information structure affected choice of intonation pattern ($p < 0.0001$)
 - Topic: no accent
 - Focus: H*L and !H*L
 - preference for H*L

Results: adults (cont'd)

- Focus:
 - typically accented (with H*L) independent of sentence position
- Topic:
 - typically unaccented sentence-finally
 - but accented (with H*L) sentence-initially
 - rhythmically motivated
 - optional
 - But are sentence-initial topic and focus distinguished phonetically?



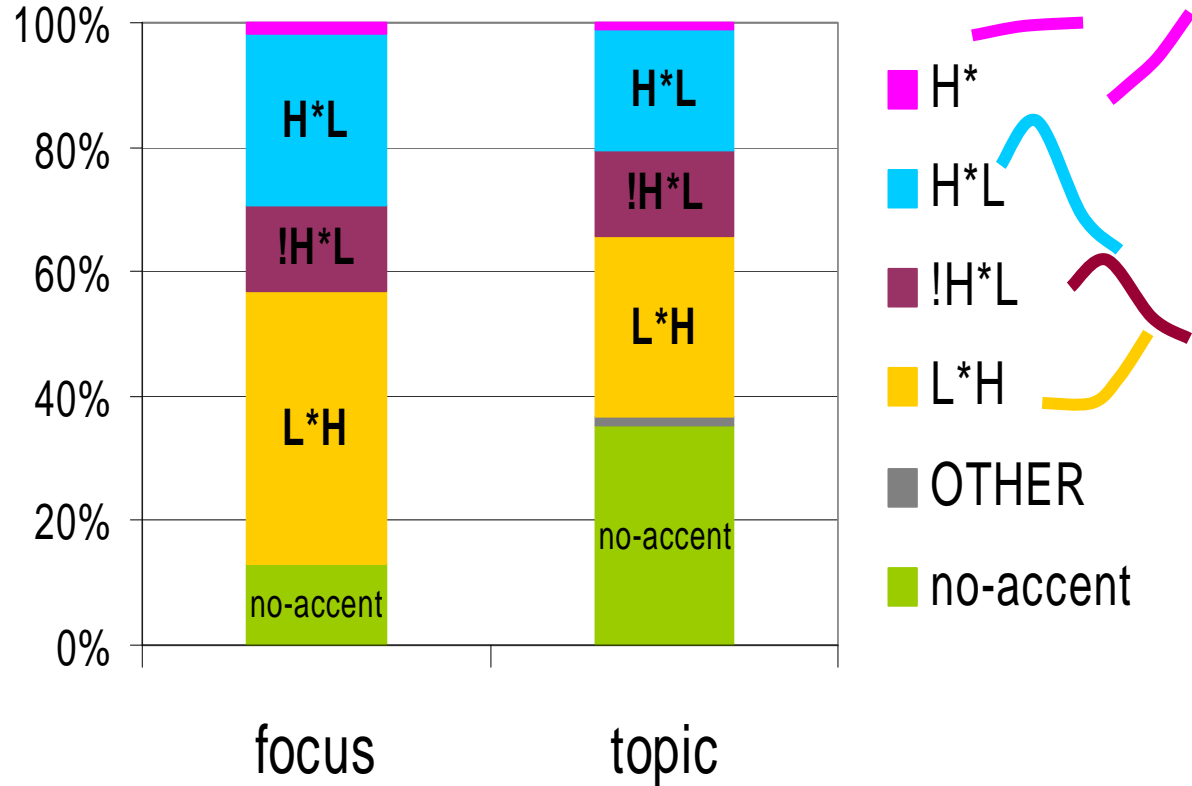
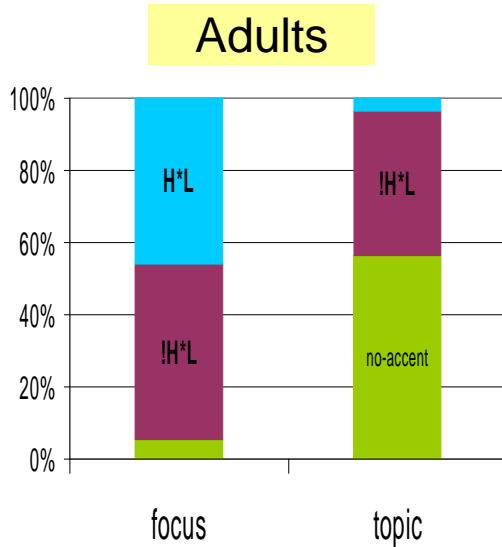
Results: 'neutral group'_sentence initial



- No effect of information structure on choice of intonation pattern, as found in adults' speech
 - Focus and topic: H*L, H*



Results: 'neutral' group_sentence final



- Information structure affects choice of intonation pattern ($p < 0.0001$)
 - Topic: no-accent ---- adult-like
 - Focus: H*L, !H*L, L*H (but no preference for H*L) ---- unlike adults₂₇

Results: 'neutral' group vs. adults

- Like adults:
 - realising sentence-initial topic and focus
 - Accent placement in sentence-final topic and focus
 - accentuation over no accent in final focus
 - no accent over accentuation in final topic
- Unlike adults:
 - showing no preference for H*L in final focus
 - frequent use of L*H
- Why do they use L*H?
 - Seeking confirmation from the adult
 - A manner of speaking
- Regression models without L*H: still lack of preference of H*L over !H*L in sentence-final focus



Results: 'playful' group



De paashaas schildert een voetbal.



De pestkop pakt de vaas.



Het bed kleurt een paasei.



Pad eet tompoes.



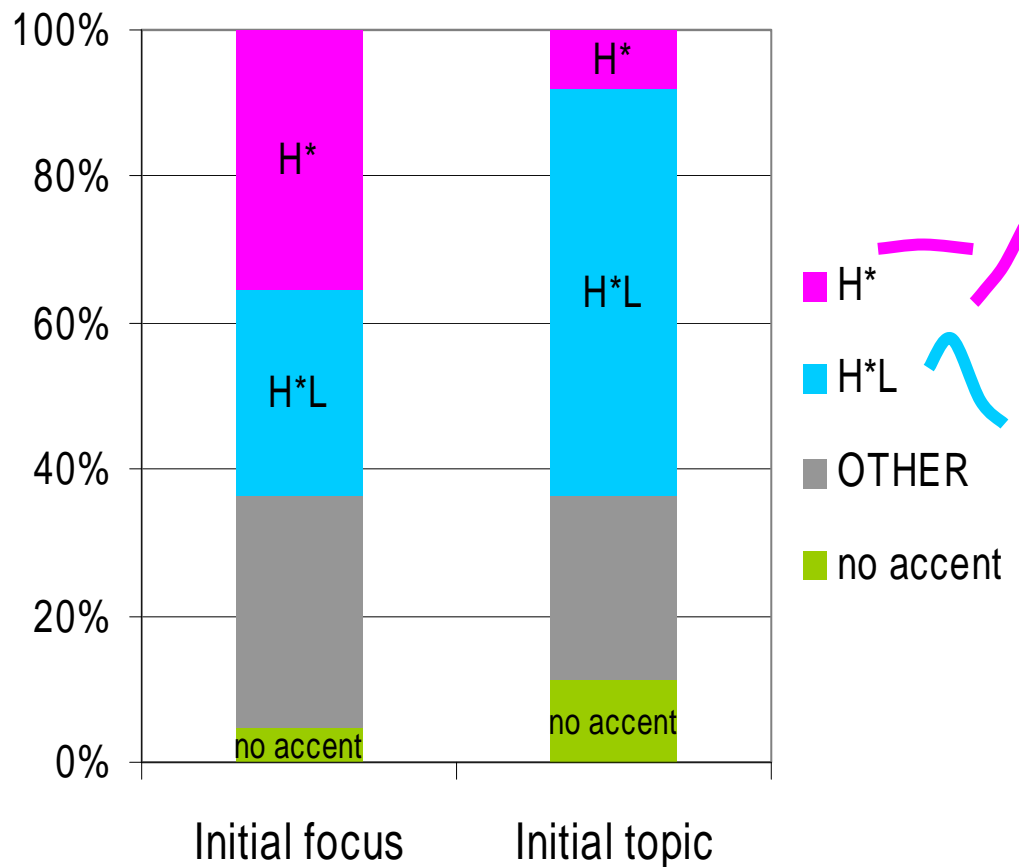
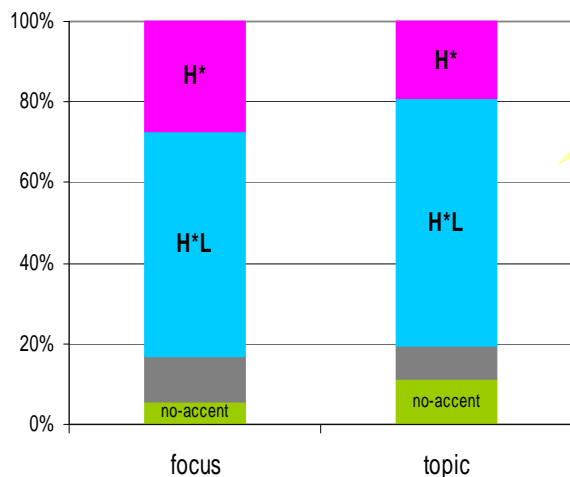
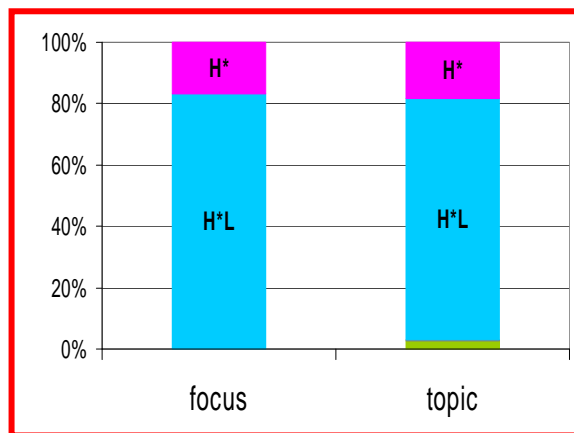
De poetsvrouw pakt de vaas.



- Characteristics of 'playful' 4- to 5-year-olds
 - A wider pitch span (150 ~ 600Hz vs. 100Hz ~ 450 Hz in other children)
 - Substantial intra-speaker variation in voice quality and speaking styles
 - Phrasing
 - More ups and downs in their intonation
 - Laughing while speaking sometimes



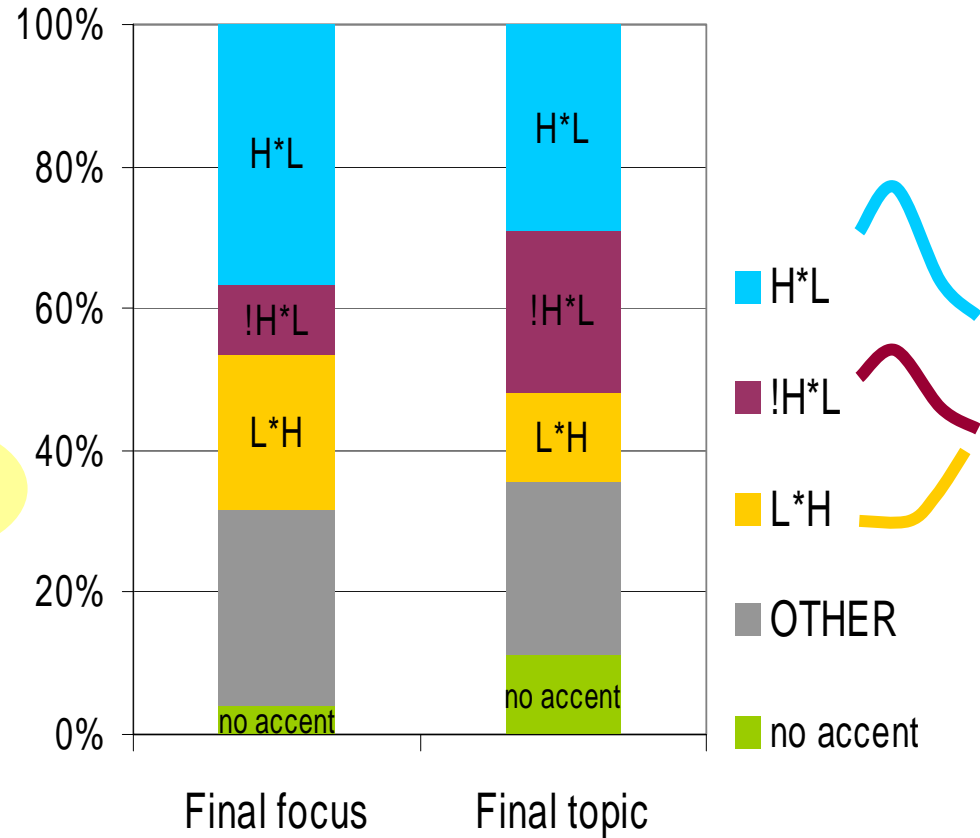
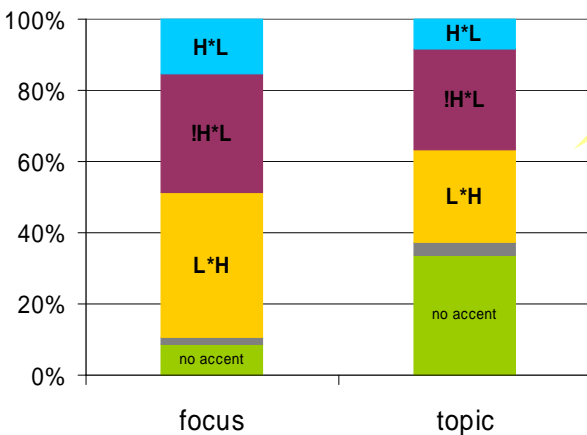
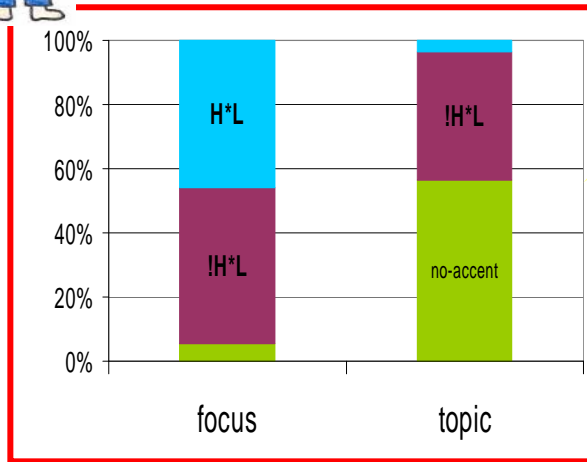
Results: 'playful' group - sentence initial



- Accent both topic and focus, like adults and 'neutral' group
- But: H* more likely in focus than in topic, compared to H*L (P < 0.005)



Results: 'playful' group _sentence final



- Accent focus as well as topic, unlike adults and 'neutral' group
- No clear preference for H*L in focus

Conclusions: 'playful' group vs. 'neutral' group and adults

- More frequent use of accentuation to realise a noun regardless of sentence position and information structure in 'playful' group
 - This is interpreted as a tendency to speak in an emphatic manner
 - This interpretation fits nicely with the observation that they break a sentence into more than one IP more often than the other children
- The 'playful' group's preference for H* to H*L in initial focus but for H*L to H* in initial topic
 - Conveying new information in a less predictable pattern (i.e. H*); conveying given information in a more predictable pattern (i.e. H*L)



Study 3

- Same picture matching game
- 7- to 8-year-olds (N=12, mean age 8;0)
- Overall quite adultlike:
 - Preference for H*L over !H*L in sentence-final focus
- Different from adults:
 - Preference for H*L to H* in sentence-initial focus but not in sentence-initial topic -> a strategy for distinguishing focus from topic