

## Focus interpretation in typical and atypical acquisition of Hungarian

Bence Kas<sup>1,3</sup> and Ágnes Lukács<sup>1,2</sup>

[benkas@nyitud.hu](mailto:benkas@nyitud.hu)

1 Research Institute for Linguistics, HAS  
2 Budapest University of Technology, Department of Cognitive Science  
3 Eotvos Lorand University of Sciences, Department of Phonetics and Logopedics

## Aims

- To study the exhaustive interpretation of focus sentences in typical and atypical language acquisition
- To investigate children's sensitivity to structural differences related to specific semantics without lexical markers like 'csak' (only)

A szarvas javítja a tévét  
The deer fixes the TV-Acc



A SZARVAS javítja a tévét  
The deer fixes the TV-Acc  
„It is the deer who fixes the TV”



## Focus marking in Hungarian

- Syntactic markers
  - Focussed phrase directly precedes the verb (syntactic cue 1)
  - Verb modifier follows the verb (syntactic cue 2)
- Prosodic marker
  - Contrastive stress (prosodic cue)

## Questions

- At what age do children interpret focus to mark exclusion?
- Which cues do they rely on?
  - Pre-verbal position, stress or prefix movement?
  - Does the coalition of cues (syntactic and prosodic) help?
  - Do children with language disorder show limitations or deviant profiles in the comprehension of focus?

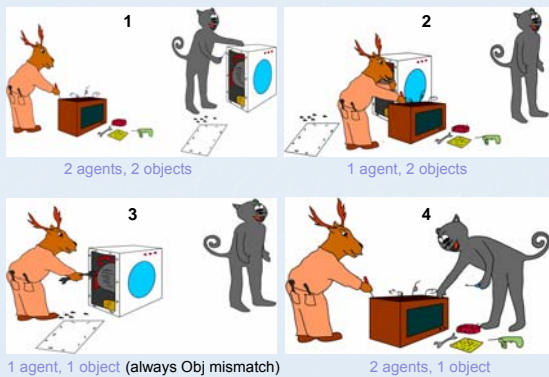
## Participants and method

- 21 adults (12 women and 9 men)
  - Age: 19;10 – 51;1 years
- 28 children with language disorder (LD)
  - two age groups: 4;10 – 7;2 and 9;6 – 13;4
- 28 typically developing children (TD) matched on receptive vocabulary scores
  - two age groups: 3;6 – 6;9 and 7;2 – 10;8
- Verification of picture-sentence pairs
  - Judgements of match between sentence and picture (yes/no)
  - 4 picture types X 6 sentence types = 24 item types
  - 6 settings with different referents
  - 144 items altogether
  - Digitized experiment with randomized items for each child

## Sentence types

Pattern	Example
(a) Neutral SVO	A 'szarvas 'szereli a 'tévét. The deer fixes the TV-Acc
(b) SVO with object stress	A 'szarvas 'szereli a *'tévét. The deer fixes the TV-Acc
(c) SVO with subject focus and verbal prefix	A "szarvas szereli meg a 'tévét. The deer fixes Perf the TV ,It is the deer that fixes the TV"
(d) Neutral SOV	A 'szarvas a 'tévét 'szereli. The deer the TV-Acc fixes
(e) SOV with object focus	A 'szarvas a *'tévét szereli. The deer the TV-Acc fixes ,It is the TV that the deer fixes"
(f) SOV with object focus and verbal prefix	A 'szarvas a *'tévét szereli meg. The deer the TV-Acc fixes Perf ,It is the TV that the deer fixes"

## Picture types



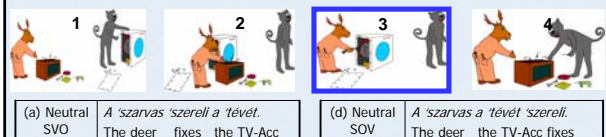
## Hypotheses

- Children accept one and two agents or objects with neutral sentences (except picture 3 with object reference mismatch)
- Children only accept single objects with object focus sentences
- Children only accept single agents with subject focus sentences
- Presence of more focus cues increases exclusionary interpretation
- Older children understand the exclusionary meaning of focus better
- Children with LD exhibit problems with interpretation of focus-sentences

## Results

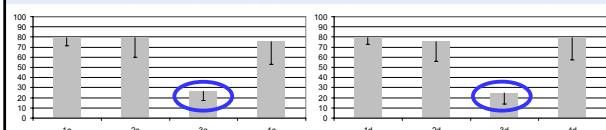
- Adult data
- Child data (typical and atypical development)

## Acceptance of pictures for neutral sentences by adults

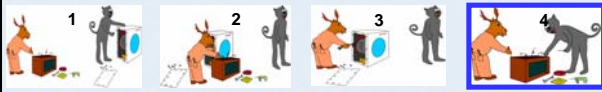


Adult group: 1=2>\*\*\*3<\*\*\*4

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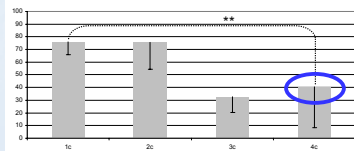


## Acceptance of pictures for subject focus sentences by adults



(c) SVO with subject focus and verbal prefix  
A 'szarvas szereli meg a 'tévét.  
The deer fixes Perf the TV  
'It is the deer that fixes the TV'

Adult group: 1=2>\*\*\*3=4

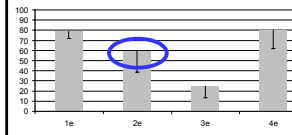


## Acceptance of pictures for object focus sentences by adults



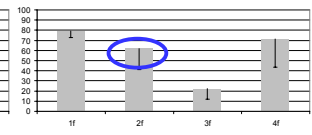
(e) SOV with object focus  
A 'szarvas a 'tévét szereli.  
The deer the TV-Acc fixes  
'It is the TV that the deer fixes'

Adult group: 1>\*\*\*2>\*\*\*3<\*\*\*4



(f) SOV with object focus and verbal prefix  
A 'szarvas a 'tévét szereli meg.  
The deer the TV-Acc fixes Perf  
'It is the TV that the deer fixes'

Adult group: 1>\*2>\*\*\*3<\*\*\*4

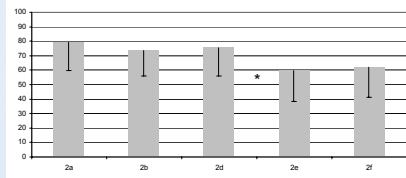


## Acceptance of sentences for one agent on two objects by adults

- (a) Neutral SVO
- (b) SVO with object stress
- (d) Neutral SOV
- (e) SOV with object focus
- (f) SOV with object focus and verbal prefix



Adult group: a=b=d>\*e=f



## 2. Results for children

### ■ Repeated measures ANOVA:

#### ■ Between subjects

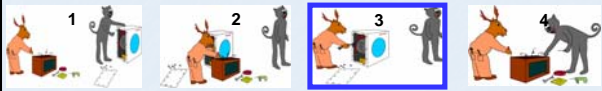
- GROUP (TD-LD) ns.
- AGE GROUP (younger-older) p<0,01

#### ■ Within subjects

- PICTURE (1-4) p<0,001
- SENTENCE (a-f) p<0,05
- PICTURE\*SENTENCE n. s.



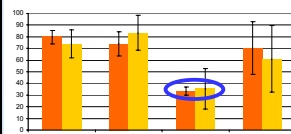
## Acceptance of pictures for neutral sentences in typical development



(a) Neutral SVO  
A 'szarvas 'szereli a 'tévét.  
The deer fixes the TV-Acc

Younger group: 1=2>\*\*\*3<\*\*\*4

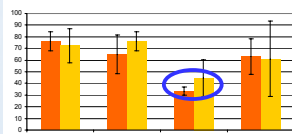
Older group: 1=2>\*\*\*3<\*4



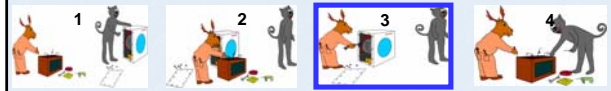
(d) Neutral SOV  
A 'szarvas a 'tévét 'szereli.  
The deer the TV-Acc fixes

Younger group: 1=2>\*\*\*3=4

Older group: 1=2>\*\*\*3<\*\*\*4



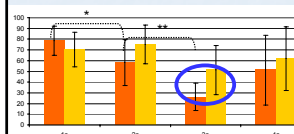
## Acceptance of pictures for neutral sentences in language disorder



(a) Neutral SVO  
A 'szarvas 'szereli a 'tévét.  
The deer fixes the TV-Acc

Younger group: 1=2=3=4

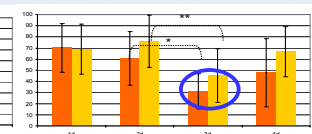
Older group: 1<\*2>\*\*\*3=4



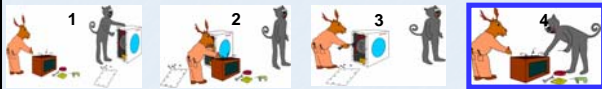
(d) Neutral SOV  
A 'szarvas a 'tévét 'szereli.  
The deer the TV-Acc fixes

Younger group: 1=2>\*\*\*3=4

Older group: 1=2>\*3=4



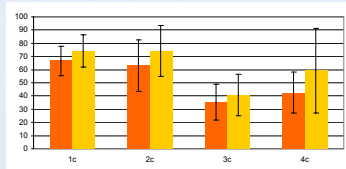
## Acceptance of pictures for subject focus sentences in TD



(c) SVO with subject focus and verbal prefix

A "szarvas szereli meg a 'tévét.  
The deer fixes Perf the TV  
,It is the deer that fixes the TV"

Younger group: 2 > \*\*\*3 = 4; 1 = 4  
Older group: 2 > \*\*3 = 4; 1 = 4



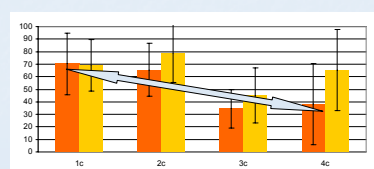
## Acceptance of pictures for subject focus sentences in LD



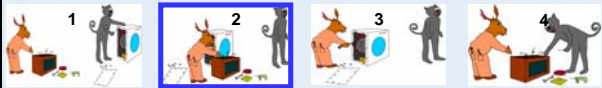
(c) SVO with subject focus and verbal prefix

A "szarvas szereli meg a 'tévét.  
The deer fixes Perf the TV  
,It is the deer that fixes the TV"

Younger group: 2 > \*\*3 = 4; 1 = 4  
Older group: 2 > \*\*3 = 4; 1 > 4



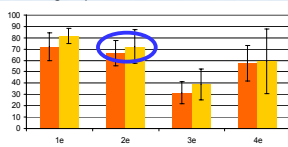
## Acceptance of pictures for object focus sentences in TD



(e) SOV with object focus

A szarvas a "tévét szereli.  
The deer the TV-Acc fixes  
,It is the TV that the deer fixes"

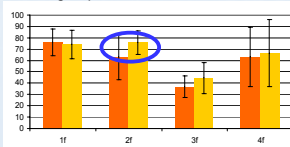
Younger group: 1 = 2 > \*\*\*3 < \*4  
Older group: 1 = 2 > \*\*3 < \*\*4



(f) SOV with object focus and verbal prefix

A "szarvas a "tévét szereli meg.  
The deer the TV-Acc fixes Perf  
,It is the TV that the deer fixes"

Younger group: 1 = 2 > \*\*\*3 < \*4  
Older group: 1 = 2 > \*3 < \*\*4



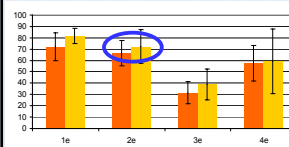
## Acceptance of pictures for object focus sentences in LD



(e) SOV with object focus

A szarvas a "tévét szereli.  
The deer the TV-Acc fixes  
,It is the TV that the deer fixes"

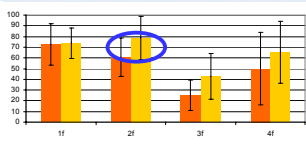
Younger group: 2 > \*\*3 = 4; 1 = 2 = 4  
Older group: 2 > \*\*3 = 4; 1 = 2 = 4



(f) SOV with object focus and verbal prefix

A szarvas a "tévét szereli meg.  
The deer the TV-Acc fixes Perf  
,It is the TV that the deer fixes"

Younger group: 2 > \*\*3 = 4; 1 = 2 = 4  
Older group: 2 > \*\*3 = 4; 1 = 2 = 4



## Discussion - adults

- Linguistic predictions confirmed:
  - Acceptance of neutral sentences for events with any number of agents or objects
  - Bigger rejection rates of pictures with two agents for subject focus sentences
  - Bigger rejection rates of pictures with two objects for object focus sentences
- Exclusionary interpretation linked to the combination of verb-preceding position and contrastive stress (syntactic and prosodic cues)

## Discussion - children

- No signs of exclusionary interpretation of either subject or object focus by either TD or LD children
- Great inter-individual differences in focus interpretation
- A slight tendency for subject focus sensitivity only in the older LD group
- Similar pattern of difficulties for children with language disorder and younger controls
  - A difference: LD children treated neutral sentences as exhaustive for subjects
- Coalition of two cues helped focus recognition
  - The third cue did not add to this (lower accessibility?)
- Does not decide between parametric and prosodic theories of focus (discussed by Costa and Szendrői 2006)

## Overall conclusions

- Children do not always include explicit sets of alternatives for focus sentences in their discourse models, and accept any event consistent with the sentence regardless of focus (Paterson et al. 2003)
- This phenomenon persists in LD for a longer period
- Computation of contrast sets also seems to be costly for adults (40% and 60% acceptance rates for S and O focus, respectively)

## Further research

- Interpretation of focus sentences with lexical markers of exclusion ('csak')
- More natural experimental situation to help children recognise set relations (e.g. explicit reference to contrast sets in the preceding context).

## Acknowledgments

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- Participants
- OTKA (T 034814), NIH 2 R01DC00458-18/511-1776-01 to prof. Laurence B. Leonard

Thank you for your attention!



## Focus marking across languages

- Focus-marking shows parametric variation: syntactic or prosodic (Horváth 1986, Rizzi 1997)
  - If a language marks focus syntactically, prosodic effects are coincidental. Syntactic marking is sufficient for encoding focus information, and prosody plays no role
- Focus is universally marked by prosodic prominence (Reinhart 1995, Szendrői 2001)
  - Any syntactic effects associated with focus are direct consequences of the prosodic organization of the language

## Acquisition data and focus theories

- Costa & Szendrői's (2006) general claims:
  - Parametric view → difficulties with syntactic marking in a L that marks focus syntactically, with prosodic marking in a L that marks it prosodically, and with both in L that uses both (no difference in relative difficulty between languages, as all strategies require the setting of one parameter)
  - Prosodic view → difficulties only with prosodic focus marking

## Predictions for Hungarian

- Parametric view: Hungarian marks focus syntactically with coincidental prosodic patterns → syntactic problems during acquisition
- Prosodic view: Syntactic patterns are governed by the prosodic type of the language → prosodic problems during acquisition
- A problem: verb-preceding position is only recognised as focus with contrastive stress and vica versa → the above predictions are not clearly distinguishable
- A different view: when both syntactic and prosodic focus markers are present, it is not their principal relationship that determines processing but their accessibility and reliability → cue strength

## Competition model (MacWhinney & Bates)

- Usage-based model of language processing and acquisition
- Key notions of learnability: accessibility and reliability of cues linked to a certain construction
  - Accessibility: the degree to which a cue is present in the input
  - Reliability: the degree to which a cue is linked to a certain meaning/function

## Learnability of focus cues

- In Hungarian, prosodic and syntactic cues together are fully reliable markers of focus (alone neither is!).  
A 'szarvas 'javítja a 'tévét.      A 'szarvas 'javítja a "TEVET.  
The deer fixes the TV.              The deer fixes the TV.
- The postverbal position of the verb modifier is not fully accessible  
A "szarvas javítja (meg) a tévét.  
The DEER fixes (Perf) the TV.
- Prediction: sentences with a coalition of cues are more likely to be recognised as focus sentences (marking exclusion) than those with only one cue