

When is children's scope interpretation non-isomorphic, and why?

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Claims:

- (1) Hungarian preschoolers can access both the isomorphic and the inverse scope readings of doubly quantified sentences – contrary to Musolino's (1998) Observed Isomorphism.
- (2) Scopal ambiguity represents a garden-path problem (Musolino & Lidz 2003; 2006), which children resolve by sticking to the default reading as long as it is compatible with pragmatics. The default reading of doubly quantified sentences is not the isomorphic but the collective reading.
- (3) As distributive readings are dissociated from the linear flow of speech, their scope order can be determined by factors other than linear order, e.g., by thematic prominence, or the structure of the visual input, which may yield inverse readings.

Claim 1:

The interpretation of doubly quantified sentences is not isomorphic!

Evidence: Experiment 1

Research question: Do Hungarian preschoolers accept the isomorphic and the inverse distributive readings of doubly quantified sentences such as (1)?

Participants: 46 children (aged 6;5, SD 4 months)

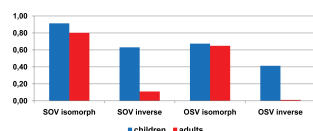
Materials: sentence-picture pairs where the sentence is SOV or OSV, and the picture shows either its isomorphic reading (Picture A) or its inverse reading (Picture B).

Method: Truth value judgement

- (1) *Két tornyot is három fiú épít.*
two tower-ACC DIST three boy builds
'Two towers each are being built by three boys.'



Results: Children show only a mild bias towards isomorphism, whereas adult answers are highly isomorphic:



Acceptance of isomorphic and inverse scope in Exp.1

Experiment 2:

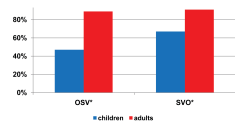
Research question: Do Hungarian preschoolers prefer the isomorphic or the inverse scope interpretation of doubly quantified sentences?

Participants: 41 preschoolers (aged 6;5, SD 4 months)

Materials: doubly quantified SOV and OSV sentences such as (1) associated with pairs of pictures such as Pictures A-B showing their isomorphic and inverse readings

Method: Forced Choice (Which picture is the puppet talking about?)

Results: Children show no clear preference for isomorphic readings, as opposed to adults:



Isomorphic scope choices in Exp.2

Why don't Hungarian children show the isomorphism observed by Musolino (1998)?

Because Musolino's generalization is based on sentences involving quantification and negation, whereas we tested doubly quantified sentences. English and Chinese children are also less isomorphic than adults in the interpretation of doubly quantified sentences (Musolino 2009; Lee 2003).

Observed isomorphism is limited to the interaction of quantification and negation, and does not extend to doubly quantified sentences.

Claim 2:

The default reading of doubly quantified sentences is the collective reading!

Evidence: Experiment 3

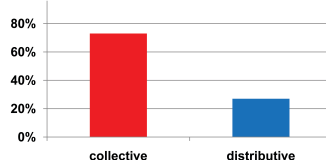
Participants: 48 preschoolers (aged 6;5, SD 4 months)

Research question: Which is the default reading of doubly quantified sentences for Hungarian preschoolers?

Materials: Doubly quantified sentences such as (2)-(3); sets of identical toys

Method: Acting Out

Results: Children acted out the collective reading in 72,5% of all the test cases. Distributive interpretations occurred only when the collective reading was pragmatically implausible (as in (3)).



- (2) *Három maci is két autóval játszik.*
three bear DIST two car-with plays
'Three bears each are playing with two cars'

Collective reading (3 bears/2 cars): 100%
Dist. reading (3 bears/6 cars, or 6 bears/2 cars): 0%

- (3) *Három maci is két cukorkát kapott.*
three bear DIST two candies got.
'Three bears each got two candies.'

Collective reading (3 bears/2 candies): 65%
Distributive reading (3 bears/6 candies): 35%

Musolino & Lidz (2003, 2006) argue that the default reading of sentences with quantification and negation, to which children are committed, is the isomorphic reading. We show that the **default reading of doubly quantified sentences**, to which children are committed until pragmatics forces them to revise it, **is the collective reading!**

References

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Musolino, J., 1998. Universal Grammar and the Acquisition of Semantic Knowledge: An Experimental Investigation of Quantifier-negation Interactions in English. Doctoral Dissertation, University of Maryland.
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Claim 3:

The distributive readings are accessed at a second attempt!

As the default reading of doubly quantified sentences is the collective reading, distributive readings are accessed at a second attempt, i.e., their interpretation is dissociated from the linear flow of speech. Hence their scope order can be determined by factors other than linear order, e.g., by thematic prominence, or the structure of the visual input, which may yield inverse readings.

Evidence: Experiment 4

Hypothesis: As a distributive reading represents a garden-path problem, it requires a longer reaction time than the collective reading.

Participants: 23 children (aged 5;11, SD 6 months)

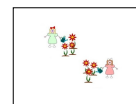
Materials: sentence-picture pairs where the sentence (e.g. (4)) is SOV or OSV, and the picture shows its collective (Picture C), or isomorphic (Picture D), or inverse reading (Picture E).

Method: Reaction-time of truth value judgements

- (4) *Két lány is három virágot locsol.*
two girl DIST three flower-ACC waters
'Two girls each are watering three flowers.'



Picture C

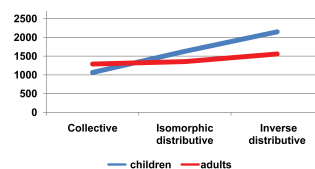


Picture D



Picture E

Results: Children access the distributive readings significantly more slowly than the collective readings. They also access the inverse readings significantly more slowly than the isomorphic readings. Adults' reaction times by readings do not differ significantly.



Reaction times of collective, isomorph distributive, and inverse distributive readings (ms)

The increased reaction time of children's distributive answers supports the hypothesis that distributive readings are accessed after the failure of the collective interpretation, at a 2nd attempt.

For adults, there is no difference between the reaction times. They face no garden-path problem –presumably because the distributive particle *is* 'each' blocks the collective interpretation for them.