Probing OR vs. NOT-OR in French children

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Child disjunction across positive and negative contexts: Evidence from French

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Positive disjunction (OR)

- Pragmatic reasoning: scalar implicature.

(1) Liz drew the flower **or** the tree.
= Liz drew **either** the flower **or** the tree.
→ *Exclusive* reading.

(2) a. **Generate AND alternative**
Liz drew the flower and the tree.
b. **Strengthening**
Liz drew the flower or the tree…
…but not both.

- Children's non-target readings of OR:

(3) Liz drew the flower **and/or** the tree.
→ *Inclusive* reading "**and/or**" [1].
Failure to compute scalar implicature.

(4) Liz drew the flower **and** the tree.
→ *Conjunctive* reading "**both**" [7].
i. Failure to generate AND alternative.
ii. Conjunctive inference trigerred by (i).
(via an exhaustification mechanism)

Negated disjunction (NOT-OR)

- Cross-linguistic differences (PPI parameter)

(5) Liz did **not** draw the flower **or** the tree.
a. Liz drew **neither** the flower **nor** the tree.
b. **Either** Liz did **not** draw the flower **or** she did **not** draw the tree.
c. Liz did not draw the flower **and/or** the tree.
→ *Not both* reading

Neither (5a) (-PPI)	*Exclusive* (5b) (+PPI)
Dutch, English, Korean, German, Greek, Romanian, …	**French**, Italian, Japanese, Russian, Mandarin Chinese, …

- Children:
Preference for *neither* reading [5].
→ Semantic Subset Principle [2].

> When UG makes available two readings in a subset-superset relation (e.g. *neither*/*not-both*), children initially assign the subset reading (*neither*).

- Adults: *neither* reading is in fact accessible even in *exclusive* languages [3].

Selected references

[1] Chierchia, G., Guasti M.T., Gualmini A., Meroni L., Crain S., and Foppolo F. (2004). Semantic and Pragmatic Competence in Children's and Adults' Comprehension of Or. In *Experimental Pragmatics*. Edited by Ira A. Noveck and Dan Sperber, 283–300. New York: Palgrave Macmillan. **[2] Crain**, S. (2012). *The Emergence of Meaning*. Cambridge University Press. **[3] Lungu**, O., Fălăuș A. & Panzeri F. (2021). Disjunction in negative contexts: A cross-linguistic experimental study. 38 (2), 221-247. **[4] Marty,** P. & Nicolae, A. (2021). Conjunctive disjunctions: When adults behave like children. **[5] Pagliarini**, E. , Lungu O., van Hout A., Pintér L., Surányi B., Crain S. & Guasti M.T. (2021): How Adults and Children Interpret Disjunction under Negation in Dutch, French, Hungarian and Italian: A Cross-Linguistic Comparison, Language Learning and Development. **[6] Skordos**, D., Feiman R., Bale A. & Barner D. (2020). Do children interpret 'or' conjunctively? *Journal of Semantics* 37(2). 247–267. **[7] Singh**, R., Wexler K., Astle-Rahim A., Kamawar D. & Fox D. (2017). Children interpret disjunction as conjunction: Consequences for theories of implicature and child development. *Natural Language Semantics* 24. **[8] Szabolcsi**, A. (2002). Hungarian disjunction and positive polarity. In Kenesei & Siptar (eds.), *Approaches to Hungarian 8*. Budapest: Akademiai Kiado. **[9] Tieu**, L., Yatsushiro K., Cremers A., Romoli J., Sauerland U. & Chemla E. (2017), On the role of alternatives in the acquisition of simple and complex disjunctions in French and Japanese. *Journal of Semantics* 34.

Aim of study

- No acquisition study has investigated children's range of interpretation for OR across contexts.
- Research question:
To what extent are (non-)target interpretation patterns for OR and NOT-OR related within learners?
- Approach: test OR in both positive and negative contexts.
  - Same set-up and task.
  - Same participants.
- Language of interest: French.

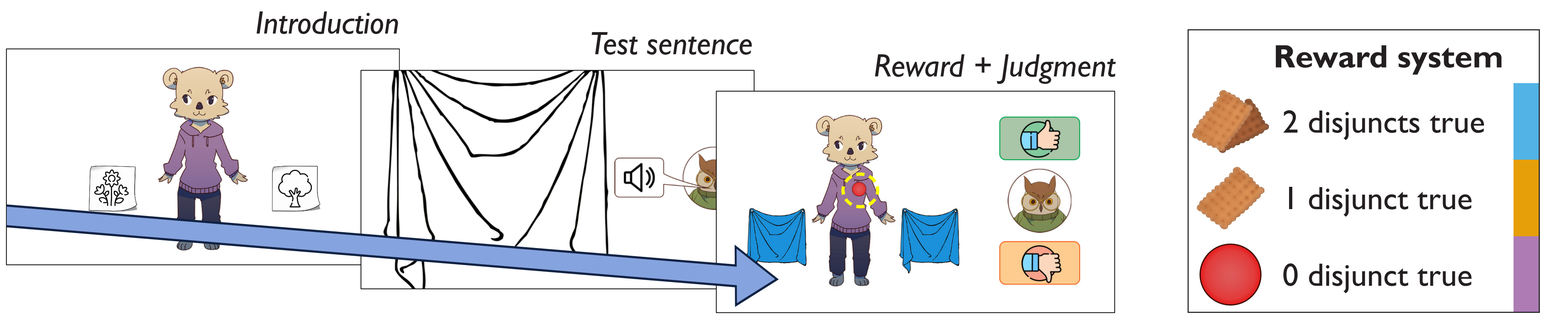
Hypotheses

- **H1:** Two adult patterns: (1) *exclusive* with OR and NOT-OR ; (2) *exclusive* OR and *neither* NOT-OR.
- **H2:** Children who fail to generate scalar implicature in positive context will fail to generate scalar implicature in negative context (assuming +PPI OR).
- **H3:** Children who fail to generate AND alternative in positive context (p AND q) will fail to generate AND alternative in negative context (¬p AND ¬q).

Predict: *Conjunctive* OR interpreters should only show *neither* readings in negative context (NOT-OR).

Methods and materials

- Truth-Value Judgment Task in Prediction mode.
  - Satisfy ignorance inference [4].
  - Falsifiable disjunctive guess [6].
- Participants: native French speakers.
  - 84 children (age = 3;6 – 8;5 | μ = 6;3), 4 age groups.
  - 77 adults (age = 18 – 67 | μ = 28;2).
- Participants have to infer from the reward what Liz did and say whether the owl made the right guess or not.



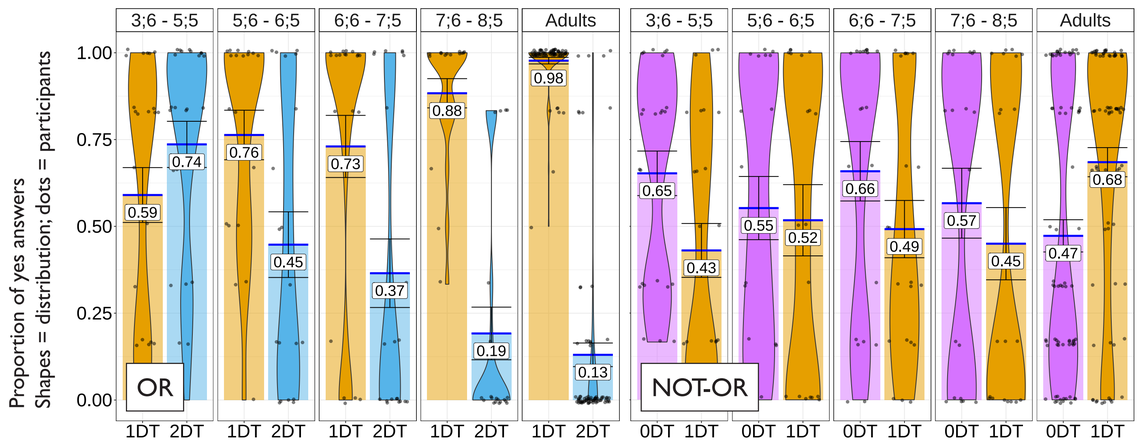
- Sample test sentences:

(6) a. OR Liz a colorié la fleur **ou** l'arbre.
"Liz colored the flower **or** the tree."

b. NOT-OR Liz **n'**a **pas** colorié la fleur **ou** l'arbre.
"Liz did **not** color the flower **or** the tree."

Results

- Systematic response patterns with OR and NOT-OR.
Bimodal distribution with NOT-OR in adults and children.
- Age effect with OR.
GMMs: *Estimate* = 2.20; *std.error* = 0.43; z = 5.11; Pr(>|z|) >.0001
But not with NOT-OR.
GMMs: *Estimate* = -0.46; *std.error* = 0.23; z = -1.94; Pr(>|z|) = 0.0518
- **Unattested**, systematic **adult** and **non-adult** patterns.
Strong criteria to categorize participants: accept 5/6 times a condition, and reject 5-6 others.



Children (ADULTS)		NOT-OR patterns			
		Exclusive	*Not-both*	*Neither*	Other
OR patterns	*Exclusive*	20 (29)	0 (2)	9 (13)	10 (17)
	Inclusive	0 (0)	1 (4)	5 (1)	4 (3)
	Conjunctive	0 (0)	0 (0)	12 (0)	2 (2)
	Other	2 (2)	0 (2)	11 (0)	8 (2)

Discussion

- **Hypothesis 1:** validated across adults as well as children.
  - **Adult pattern 1:** Idealized *exclusive* French
  - **Adult pattern 2:** *Neither* French
- **Hypothesis 3:** validated.
Conjunctive interpreters only show *neither* readings.
Two sources of *neither* readings:
  - +PPI OR and missing AND alternative.
  - −PPI OR.
- **Future research:** develop experimental paradigm that targets specifically knowledge of AND alternative.

- **Hypothesis 2:** validated.
Children either always calculate scalar implicature (SI) or do not.

OR	NOT-OR	
Exclusive SI ✓	*Exclusive* (+PPI / SI ✓)	**Adult 1**
	Not-both (+PPI / SI ✳)	✳
	Neither (−PPI)	**Adult 2**
Inclusive SI ✳	*Exclusive* (+PPI / SI ✓)	✳
	Not-both (+PPI / SI ✳)	**Non-adult**
	Neither (−PPI)	**Non-adult**