

## Background

- In addition to literal, truth-conditional meaning, meaning in language can also be obtained via
  - Pragmatic inferences
    - Generalized conversational implicatures, including scalar implicatures
    - Particularized conversational implicatures (Grice 1975; Levinson 1983, 2000)
  - Presuppositions: background information
    - Lexical presupposition
    - Implicated presupposition

## The acquisition of scalar implicatures and presuppositions

- Early studies suggest that children favor a logical, literal meaning interpretation over a pragmatically implicated meaning.

### Disjunction: (Brain & Romain 1981)

- Adults - 'either  $p$  or  $q$ '
- 7-9yo children - ' $p$  or  $q$  and perhaps both'

### Quantified expressions:

- A more logical reasoning in 4-7yo children – some being compatible with *all*, e.g., *Some giraffes have long necks.* (Smith 1980; Noveck 2011)

- Additionally, 6yo children base their felicity judgement merely on the lexical EXISTENTIAL presupposition, rather than implicated presuppositions, e.g., '*Every girl here is playing soccer*'

- Implicated presuppositions and scalar implicatures pattern together in their acquisition path, being acquired later than lexical presuppositions. (Yatsushiro 2008)

## Pragmatic deficits and autism:

- Pragmatics difficulties are consistently found across the autism spectrum disorders (ASD).

(Kim et al. 2014; Volkmar et al. 1987; a.o.)

- No significant difference between adolescents with autism and their typically developing (TD) controls in their interpretation of scalar implicatures.

- Some sparrows are birds.*
- Zebras have black or white stripes.*

(Chevallier et al. 2010; Pijnacker et al. 2009)

- Adolescents with autism over-computed scalar implicatures in a task where the answers need to be based on another person's epistemic state.

(Hochstein et al. 2017)

## Directly comparing semantic and pragmatic meanings:

### 'Not every monkey is holding a banana.'

- $\exists P_s$  (Dom): Existential presupposition for the domain

- \* *There is a monkey.*

- $\exists Imp$  (Restr  $\cap$  Scope): Restrictor-nuclear scope intersection implicature

- \* *There is a monkey holding a banana.*

- $>1 ImpPs$  (Dom): Anti-uniqueness implicated presupposition

- \* *There is more than one monkey.*

- $\neg\forall$ : Literal Not All meaning

- \* *It is not true that every monkey is holding a banana.*

## Methods

This study adapted the Covered Box paradigm (Huang et al., 2013). After the context, the participants were instructed to choose either the visible picture or the covered box to map with the auditory description.

## Methods (Cont.)

☞ In this group, every animal is holding an ice cream, ...



☞ ...but in this group, not every zebra is holding an ice cream.

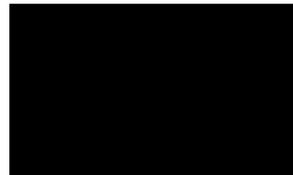


Figure 1: Example context screen (top) and test screen (bottom)

	$\exists P_s$ (Dom)	$\exists Imp$ (Restr $\cap$ Scope)	$>1 ImpPs$ (Dom)	$\neg\forall$
AllViolated	*	*	*	✓
ImpViolated	✓	*	✓	✓
ImpImpPsViolated	✓	*	*	✓
AllMet	✓	✓	✓	✓

Note: ✓ indicates a visible picture selection; \* indicated a covered box selection.

Figure 2: Predictions for compatibility of readings in all the conditions

### Filler 1



### Filler 2



### Filler 3



Figure 3: Fillers

## Inclusion criteria:

- Accuracy score over 50% in the *AllMet* condition
- Accuracy score over 50% in the *Filler 3* condition
- Accuracy score over 50% on average between *AllMet* and *Filler 3*

Table 1: Participant information

	Adults		ASD		TD	
	Included	Excluded	Group 1	Group 2	Group 1	Group 2
N (Female N)	37 (15)	3 (1)	19 (2)	13 (1)	32 (7)	28 (4)
M Age	32.43	37	10;0	9;1	8;5	7;5
M NVIQ	NA	NA	99.79	89.24	120.71	111.97

## Results

### ADULTS' ACCURACY -

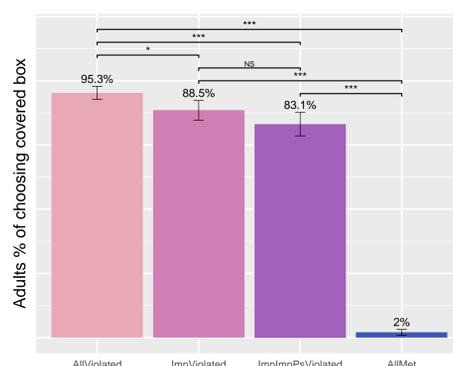


Figure 4: Adults' accuracy by condition

## Results (Cont.)

### GROUP 1 CHILDREN'S ACCURACY -

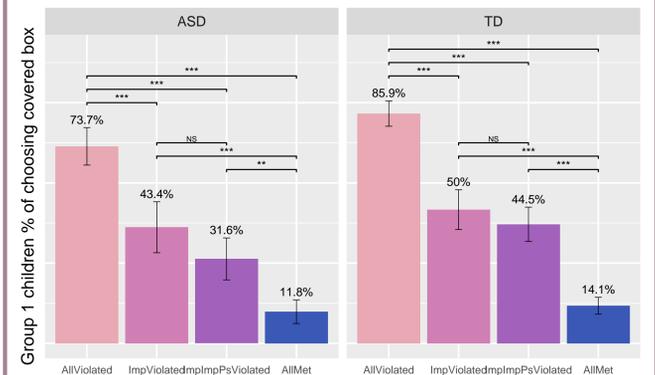


Figure 5: Group 1 children's accuracy by condition

### GROUP 2 CHILDREN'S ACCURACY -

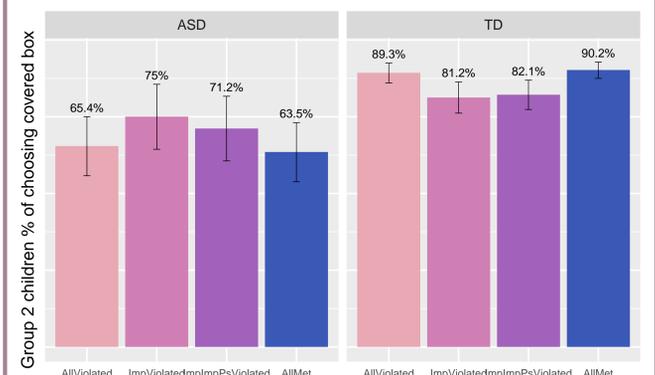


Figure 5: Group 2 children's accuracy by condition

Mixed effects logistic regression model were fitted to the covered box responses.

### ADULT DATA:

- the *AllViolated* and the *ImpImpPsViolated* conditions – empirical evidence for their access the derived meaning from EXISTENTIAL lexical presupposition
- the *ImpViolated* and the *AllMet* conditions – their computation of scalar implicature
- No significant additive effects were obtained from the ANTI-UNIQUENESS implicated presupposition in this experiment.

### CHILD DATA:

- While high proportions of children were excluded from the main statistical analyses, the included children display the same pattern as adults.
- Both children with ASD and TD children can access the meaning derived from lexical presupposition and scalar implicature.
- The most indicative of group difference between children with ASD and TD children is the children with ASD's higher acceptance of literal meaning in the *AllViolated* condition.

## Implications

- Further empirical evidence to the literature (Chevallier et al. 2010; Hochstein et al. 2017; Pijnacker et al. 2009) that not only do adolescents with ASD perform on par with TD adolescents, children with ASD are also age-appropriate in their performance on deriving scalar implicatures.
- However, children with ASD still tend to give more logical, literal responses, compared to their peers.
- Additionally, the current results adds to the literature (Legendre et al., 2011; Yatsushiro, 2008) that types of implicated presupposition matter in the acquisition pattern, considering their performance on another task in the same data collection.
- Rates of deriving scalar implicatures were also previously observed to differ by scalar terms (Papafragou and Musolino, 2003).
- It is still worth noting, though, that the effect of implicated presupposition in this task is an additional effect, on top of the incompatibility with the scalar implicature reading.