



Children's Understanding of Weak Negative Epistemic Sentences in Turkish

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Workshop on Negation

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The Issue

- How do Turkish-speaking children interpret weak negative epistemic sentences?

Introduction

- Operators in negative sentences with epistemic modals:
 - negation
 - modality

Scope Relations between Modality and Negation

- narrow scope (possible > not reading)
- wide scope (not > possible reading)

(1) Mary might not come
(possible>not)

(2) Mary cannot come
(Mary not can come)
(not>possible)

Superset vs. Subset

(1) Mary might not come

Mary's coming is not certain



**WEAK
SUPERSET**

(2) Mary cannot come

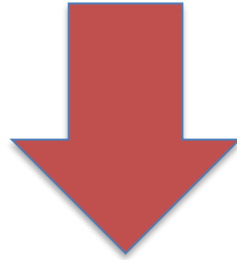
Mary is certain not to come



**STRONG
SUBSET**

Superset vs. Subset

Asymmetric entailment



learnability problem

(Moscati and Crain, 2014)

Learnability Problem

(1) Mary might not come

Mary's coming is not certain



**WEAK
SUPERSET**

(2) Mary cannot come

Mary is certain not to come



**STRONG
SUBSET**

Previous Studies

- Noveck (2001)
- Moscati (2008)
- Moscati and Crain (2014)

Moscati and Crain (2014)

- Semantic Subset Principle (SSP)
- Initial preference for strong readings

What is SSP?

- SSP is based on the issues of language learnability
- Initial preference for superset (strong reading in this case) for sentences that convey weak readings for adults

What is SSP?

- Order of the possible interpretations in LAD (Language Acquisition Device)
- Initial acquisition of the subset reading which is true in narrower circumstances

Experiment: Design

- 25 monolingual Italian-speaking children
(mean: 5;4)
- Truth-Value Judgment Test

Modality and Negation in Italian

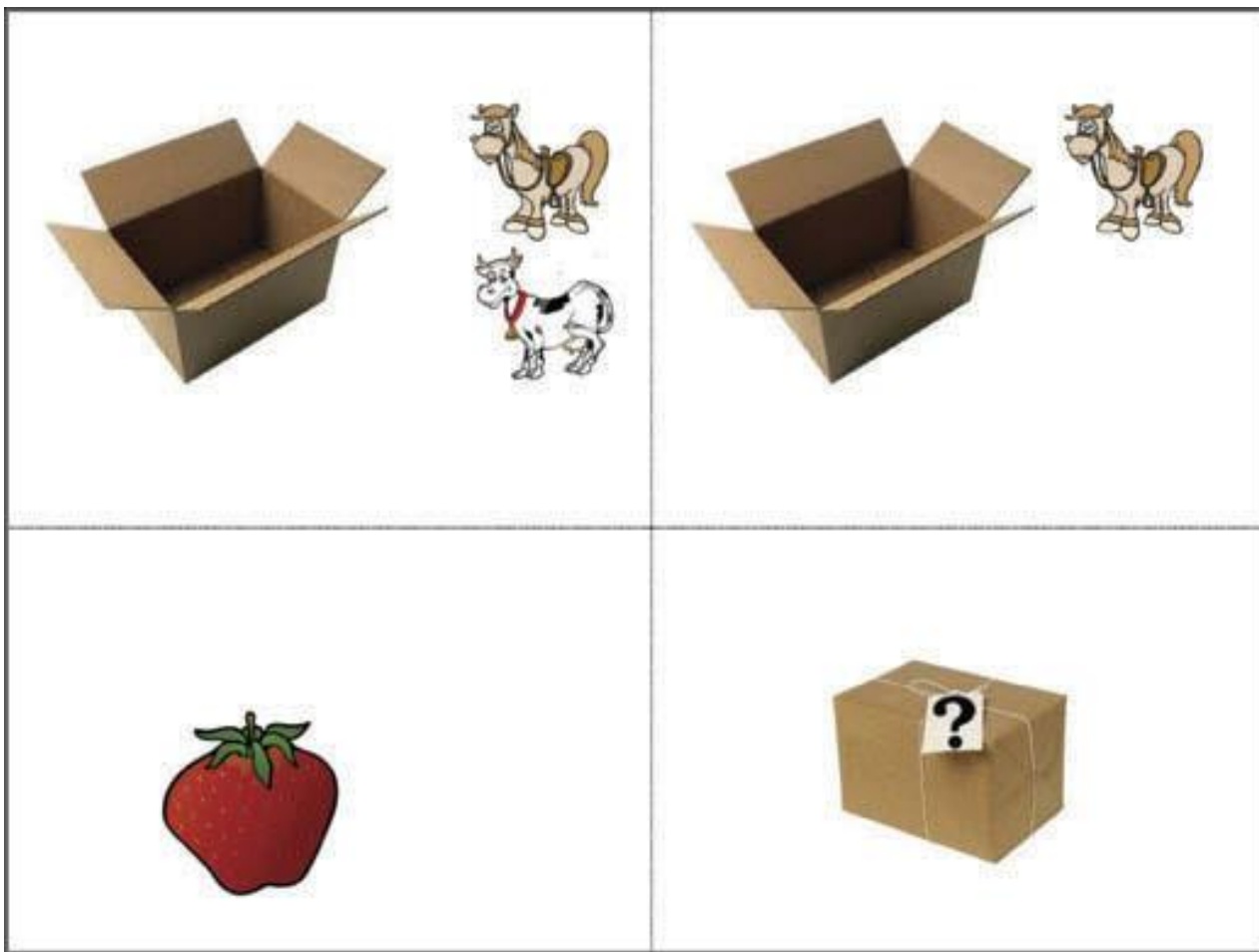
- *potere*
- *Potere* denotes both ability and possibility.
- Epistemic *potere* (possibility)

Modality and Negation in Italian

- (1) Gianni puo non venire (possible > not)
Gianni mod neg come
'Gianni might not come.'

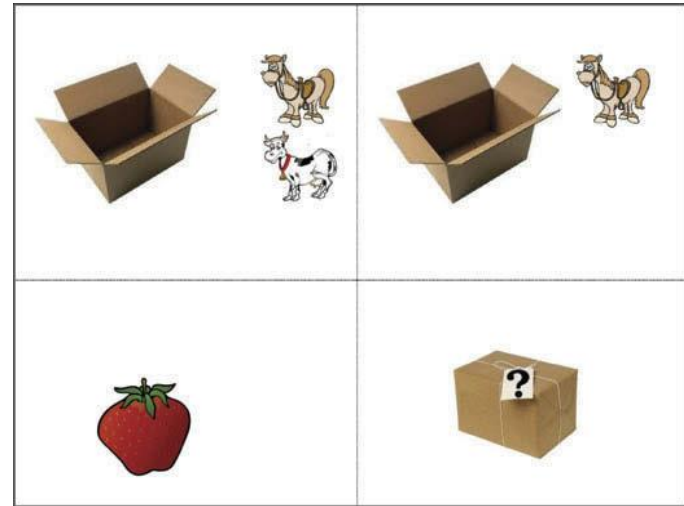
- (2) Gianni non puo venire (not > possible)
Gianni neg mod come
'Gianni cannot come'

Experiment: Procedure



Experiment: Procedure

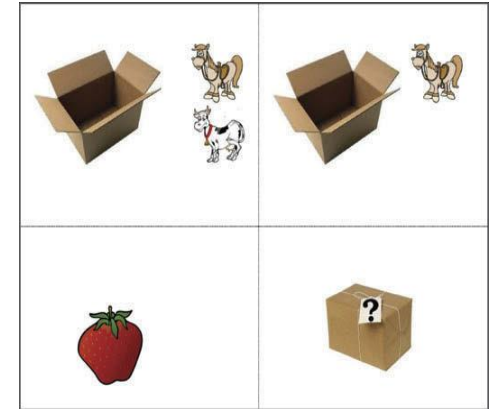
- 3 boxes in each case
- The content of the closed box is identical with one of the open boxes
- Judge the puppet's predictions about the closed box



Sample Test Items

POSITIVE

- a. Ci può essere una mucca nella scatola (T)
'There might be a cow in the box'



NEGATIVE STRONG

- b. Non ci può essere una mucca nella scatola (F)
'There cannot be a cow in the box'

NEGATIVE WEAK

- a. Ci può non essere una mucca nella scatola (T)
'There might not be a cow in the box'

Results

<i>Groups</i>	<i>Positive</i>			<i>Negative Strong</i>			<i>Negative Weak</i>		
	<i>T</i>	<i>F</i>	<i>tot.</i>	<i>T</i>	<i>F</i>	<i>tot.</i>	<i>T</i>	<i>F</i>	<i>tot.</i>
Adults	100%	100%	100%	88.7%	100%	94.4%	95%	93.7%	94.3%
	(80/80)	(80/80)	(160/160)	(71/80)	(80/80)	(151/160)	(76/80)	(75/80)	(151/160)
Children	51.5%	94%	72.8%	76.5%	78%	77.2%	35.7%	77%	56.5%
	(51/99)	(94/100)	(145/199)	(75/98)	(78/100)	(153/198)	(35/98)	(77/100)	(112/198)

Results indicate that...

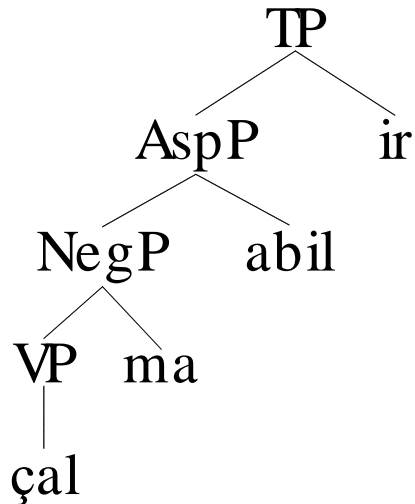
- Initial preference for strong reading
- Relatively low percentage of correct answers for Positive True Condition
 - Covert only

Modality and Negation in Turkish

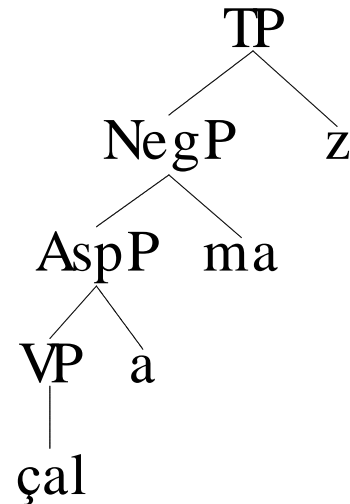
- Turkish is a morphologically rich, head-final language
- Scope relations of negation and modality are assigned by morphology i.e. through bound morphemes

Modality and Negation in Turkish

(3) Deniz çal-ma-(y)abil-ir
verb-NEG-MOD-aorist.3sg
'Deniz might not play.'



(4) Deniz çal-a-ma-z
verb-MOD-NEG-aorist.3sg
'Deniz cannot play.'



Back to our issue...

- How do Turkish-speaking children interpret weak negative epistemic sentences?

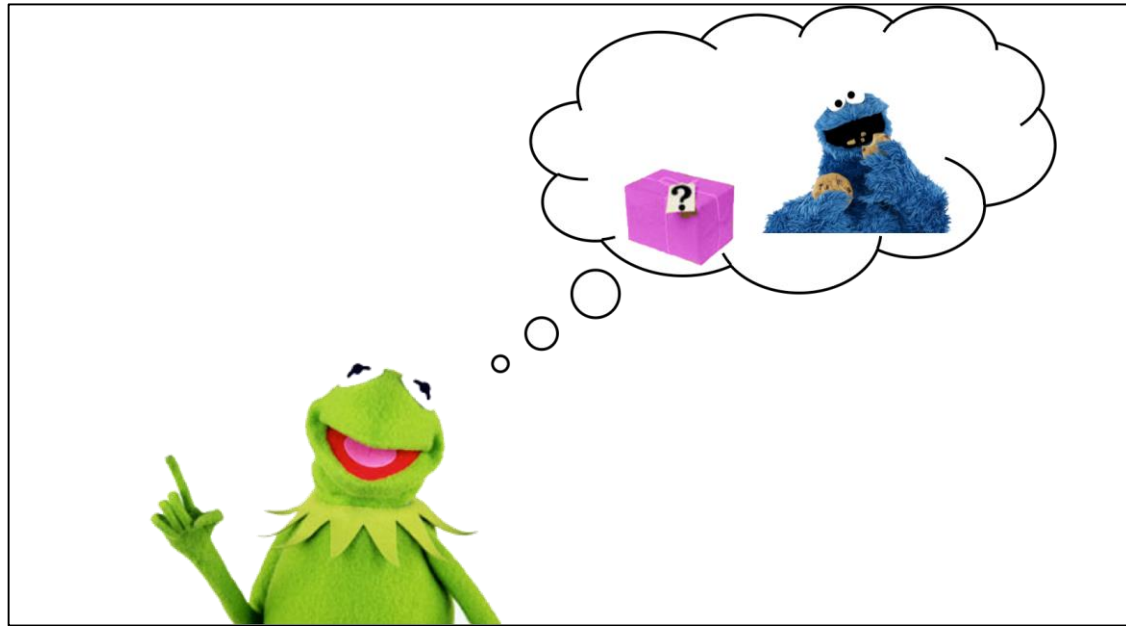
Experiment: Design

- A computer-based experiment
 - Pictures
 - Videos
- Four interconnected scenarios
- A guessing game in each scenario

Sample Scenes



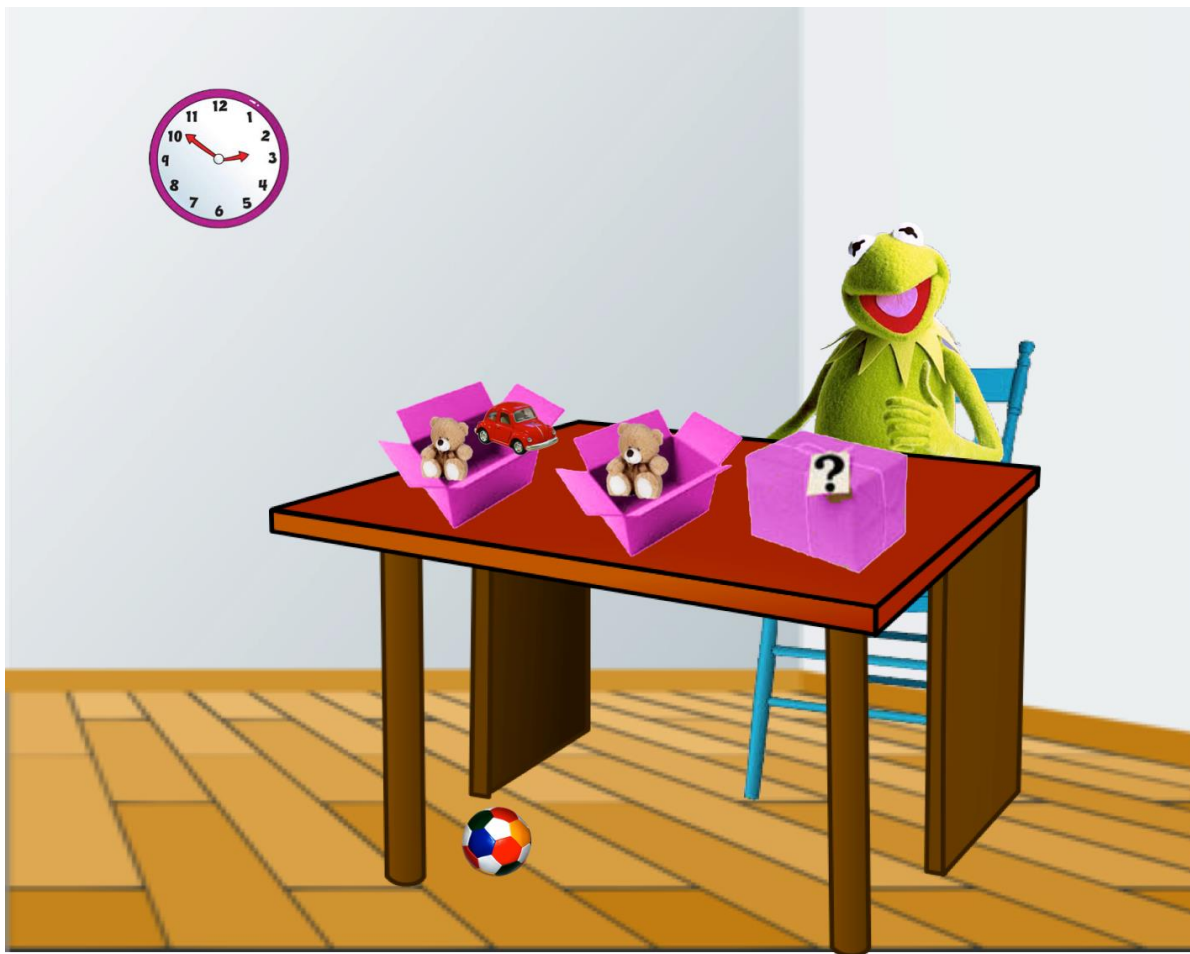
Sample Scenes



Sample Scenes



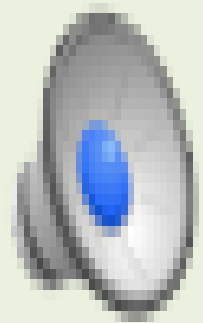
Sample Scenes



Sample Scenes



There might be
a car in the box.



Sample Test Items

	Sentences	Verb-in-use
Positive	a. There might be a car in the box. (T)	ol-abil-ir
	b. There might be a ball in the box (F)	verb-MOD-aorist.3sg
Negative Weak	a. There might not be a teddy bear in the box. (F)	ol-ma-(y)abil-ir
	b. There might not be a car in the box. (T)	verb-NEG-MOD-aorist.3sg
Negative Strong	a. There cannot be a teddy bear in the box. (F)	ol-a-ma-z
	b. There cannot be a ball in the box. (T)	verb-MOD-NEG-aorist.3sg

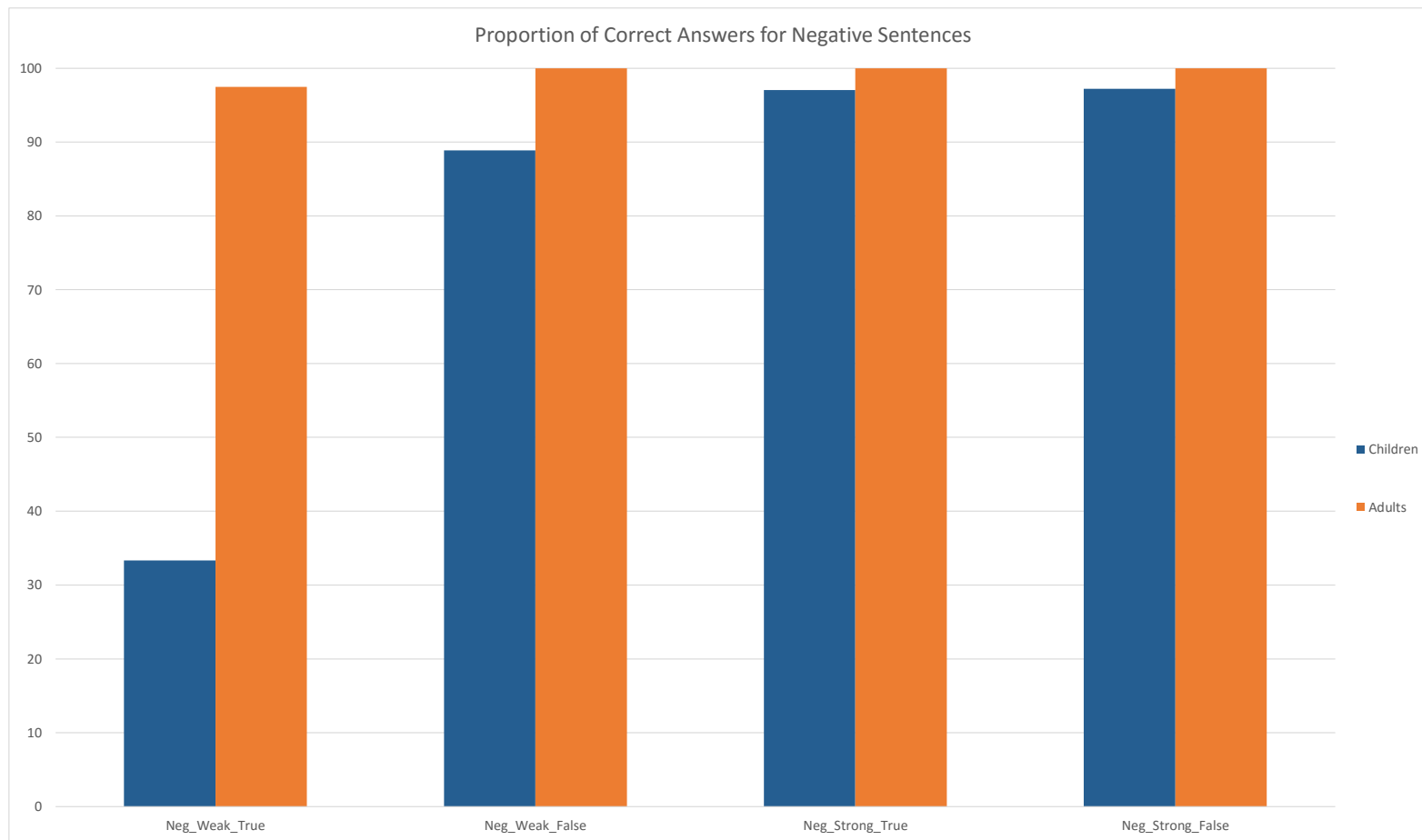
Results: Proportion of Correct Answers by Condition for The Two Groups

Groups	<u>Positive</u>		<u>Negative Weak</u>		<u>Negative Strong</u>	
	T	F	T	F	T	F
Adults	100%	100%	97,50%	100%	100%	100%
Children	<u>72,22%</u>	97,22%	33,33%	88,88%	97,05%	97,22%

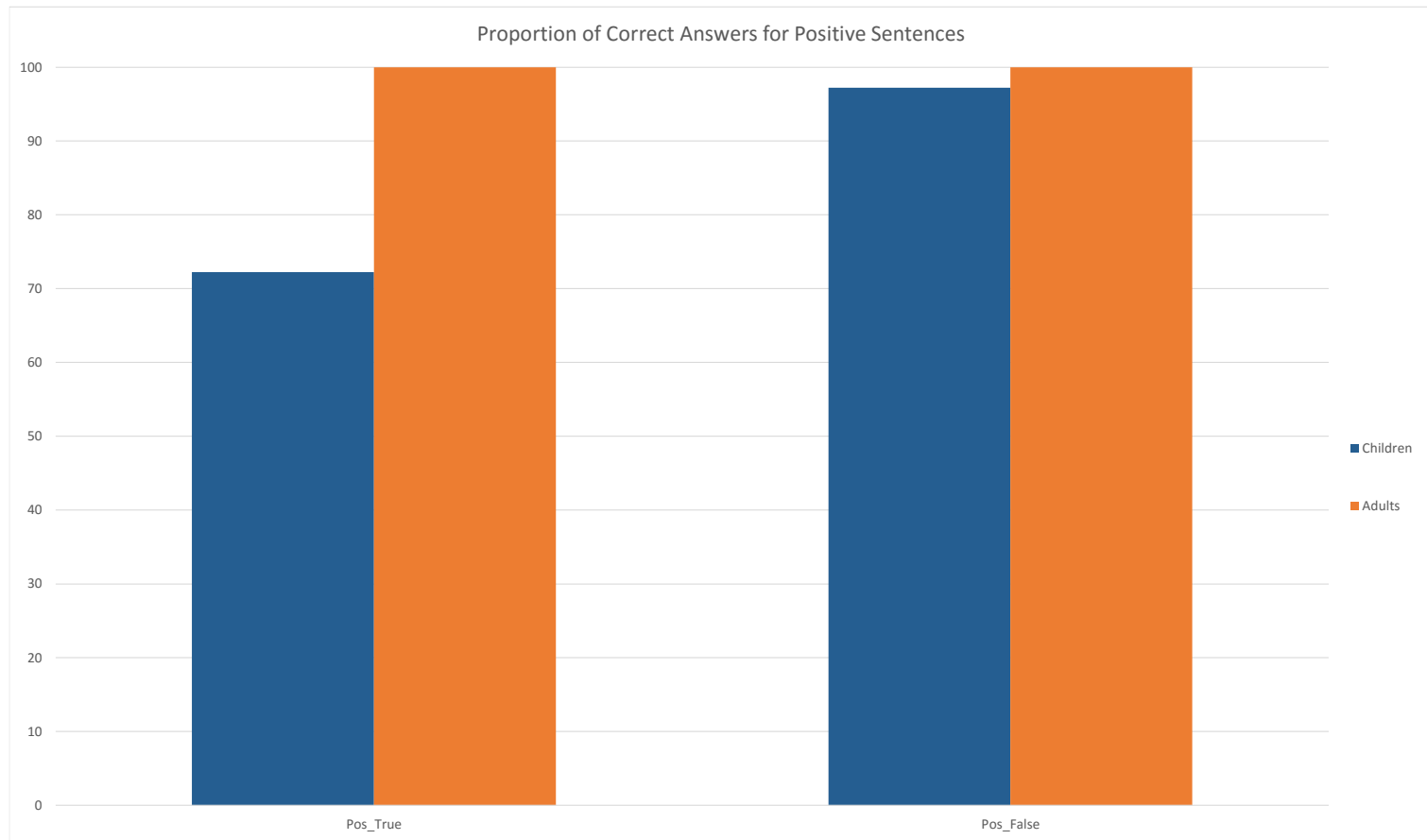
Results indicate that...

- Initial preference for strong reading
- Relatively low percentage of correct answers for Positive True Condition
 - Covert only

Results: Percentage of Correct Answers for Negative Sentences



Results: Percentage of Correct Answers for Positive Sentences



Conclusion

- Turkish-speaking children behave like their Italian speaking age-mates
 - Initial preference for strong reading
 - Relatively low percentage of correct answers for Positive True condition
- SSP
- Universal constraints on language acquisition

References

- Kelepir, M. (2001). Topics in Turkish Syntax: Clausal Structure and Scope. Ph.D. dissertation, Massachusetts Institute of Technology. Distributed by MIT Working Papers in Linguistics, Cambridge, MA.
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- Moscati, V., & Crain, S. (2014). When Negation and Epistemic Modality Combine: The Role of Information Strength in Child Language. *Language Learning and Development*, 10(4), 345–380.
- Noveck, I. (2001). When children are more logical than adults: Experimental investigations of scalar implicature. *Cognition*, 78(2), 165–188.

Thank you!