

Children can compute *any* free choice inference

INTRODUCTION: Experimental work in adult sentence processing and child language acquisition has revealed differences between the generation of scalar implicatures (SIs) and that of free choice inferences (FCIs) in disjunctive statements (Chemla & Bott, 2012; Zhou et al., 2013 (hereafter ZRC)). This paper presents evidence that 4- to 5-year-old children also compute FCIs with the FC indefinite *any*. The processing and acquisition data are challenging for theoretical approaches that treat FCIs as a type of SI (Fox, 2007; Chemla, 2010). Given the observation that explicitly mentioning alternatives helps children compute SIs (e.g., Barner et al., 2011), ZRC proposed that the relevant factor was that alternatives associated with FCIs (but not SIs) are explicitly mentioned in the target sentences. This predicts, however, that children should fail to generate FCIs if the alternatives are not explicitly mentioned, a prediction not borne out by the present data.

EXPERIMENT: We conducted a TVJT with 15 children (4;01-6;08, M=5;01). Stories involved a protagonist being given instructions by Mr. Cat, who dictates what actions can and cannot be performed on three possible objects. At the end of each story a puppet tries to recall Mr. Cat's rule, and the child's task is to judge whether the puppet was right or wrong. On a typical trial (3), Lucy was visiting a rabbit zoo and was told that she was allowed to hold the big rabbits, but not the medium-sized or small rabbits. The puppet then uttered: "Lucy was allowed to hold *any* rabbit." If children computed the FCI, they were expected to reject the sentence. Following 2 training trials, each child received 4 test and 6 control items, randomized and counterbalanced.

RESULTS:[Table-1] Children performed at ceiling on all control trials, and near ceiling on test trials, rejecting the critical FC *any*-statements 95% of the time. Children's justifications for rejecting the puppet's statements made explicit reference to the subdomain alternatives that were and were not "allowed," according to Mr. Cat's rule. Construction of domain alternatives was attested by the frequent use of *only*, e.g. "Lucy was only allowed to hold the big rabbits."

DISCUSSION: The FC disjunction and FC indefinite data converge. Children are able to compute both kinds of FCIs equally well. Since the indefinite sentences did not explicitly mention the alternatives, the findings disconfirm ZRC's proposal that children's successful generation of FCIs is due to explicitly mentioned alternatives. We explore a different hypothesis based on Singh et al. (2012), who proposed that the children's non-adult behavior with SIs is due to their inability to retrieve scalar alternative from the mental lexicon. Children have no problem with alternatives that arise from FCIs as these do not involve accessing the lexicon. Instead, the alternatives associated with FCIs correspond to a domain variable and its subsets, which are pragmatically determined (Chierchia 2006, in press). In sum, children perform well with FCIs, but less well with SIs, because constructing domain alternatives from the context poses less of a burden for children than does retrieving scalar alternatives from the mental lexicon.

Word count: 500

EXAMPLES & DATA

- (1) a. $\diamond(p \vee q)$ b. $\{\diamond p, \diamond q\}$ c. $\diamond p \wedge \diamond q$

(2) a. *Context:* Kung Fu Panda is participating in a car-pushing race with a green car and an orange car, and is only allowed to push the green car.

gongfu xiongmao keyi tui luse xiaochē huozhē juse xiaochē
 Kungfu Panda may push green car or orange car *Rejection rate: 91%*

b. *Context:* Mermaid found a white and a blue shell.

hongse meirenyu zhaodao-le baise beike huozhē lanse beike
 red mermaid find-asp white shell or blue shell *Rejection rate: 18%*

(3) *Example story (Critical test trial)*

		
<p>1. Today Lucy is visiting a rabbit farm. There are big rabbits, medium rabbits, and little baby rabbits! Will Lucy get to hold the rabbits? Let's see what Mr. Cat says. Remember, he knows all the rules!</p>	<p>2. Mr. Cat says: "Lucy, you may hold the big rabbits, but you may not hold the medium rabbits and you may not hold the small rabbits, because they're still growing."</p>	<p>3. Exp: Hey Baba, can you tell us something about the story? Baba: Hmm... Lucy was allowed to hold any rabbit!</p>

Table 1. Results on control and test trials

Trial type	Item type	N subjects	N observations	# Target	% Target
Control	FC <i>any</i>	15	30	30	100
	Modal	15	30	30	100
	NPI <i>any</i>	15	30	26	87
Test	FC <i>any</i>	15	60	57	95

REFERENCES

BARNER, D., BROOKS, N., & A. BALE. 2011. "Accessing the unsaid: the role of scalar alternatives."
CHEMLA, E. & L. BOTT. 2012. "Processing inferences at the semantics-pragmatics frontier: disjunctions and free choice."
CHEMLA, E. 2010. "Similarity: Towards a unified account of scalar implicatures, free choice permission and presupposition projection."
CHIERCHIA, G. 2006. "Broaden your views: Implicatures of domain widening and the logicity of language." *Linguistic Inquiry* 37:535-590.
FOX, D. 2007. "Free choice and the theory of scalar implicatures."
SINGH, R., WEXLER, K., HASTLE, A., KAMWAR, D., & D. FOX. 2012. "Children's interpretation of disjunctive sentences and the theory of scalar implicatures."
ZHOU, P., ROMOLI, J., & S. CRAIN. 2013. "Children's knowledge of alternatives." To appear in *Proceedings of SALT 23*.