NOT EVERY sentence is complex than SOME

A standard assumption in semantics is that quantifiers form an ordered scale with other quantifiers of the same type (e.g., <some, many, most, all>) that is responsible for the occurrence of scalar implicatures (SI) (1,2). The logical meaning of weak quantifiers like *some* (i.e., *some and possibly all*) is typically enriched to exclude stronger members of the scale (i.e., enriched *some* winds up meaning *some but not all*) (1,2). Under negation, the scale is reversed and indirect SIs are generated with strong quantifiers (i.e., *not every* logically means *not every and possibly none,* but with an SI it comes to mean *some*) (3). This implicature is assumed to be more complex than the direct one, as more elements and operations are involved. The comprehension of direct SI has been extensively studied in adults and children, showing that their behavior diverges: whereas adults tend to use the enriched meaning of *some*, children tend to stick to its logical meaning (4,5,6). However children's rates of adult-like behavior improve under certain conditions (e.g., using truth value judgment task; 4,7). This study is aimed to explore the comprehension of indirect SI in adults and children and to compare the direct and indirect implicatures in each group. Sixteen adults (mean age=22 years) and fifteen children (mean age=6 years; range 5.8-6.4) performed a truth value judgment task where they were asked to determine if statements given by a puppet in response to short videos were said well or not. Six conditions were included in the experiment: sentences with some ("some sentences") presented with videos in which all or some of the individuals performed the action mentioned in the sentence ("all videos" and "some videos"); "not every sentences" with some or none videos and "no sentences" with some or none videos (Figure 1). Both adults and children correctly responded to control items more than 90% of the trials. On critical items, most adults (14/16) adopted the enriched meaning of both *some* and *not every*. Children rejected 68% of the trials of "some sentences" presented with "all videos" and 55% of the trials of "not every sentences" with "none videos", using the implicature to explain their rejection. The difference between the rates of generating each type of implicature was significant in children (p=0.045), but not in adults. Interestingly, most of the children alternated between the two meanings of *some* and *not every*, sometimes accepting the statements, and sometimes rejecting them (Figure 2). Additionally, a significant correlation was found between the number of rejection for each of the critical conditions (p=0.006). Our results confirm that indirect implicatures are generated (although to a different extent) by both adults and children. This finding provides further evidence against the lexical approach to SI, which assumes that implicatures are attached to the lexical items and thus do not predict any indirect implicatures (8). Moreover, the lower rates of generating indirect SI in children indicate that computing indirect implicatures is more difficult than computing direct SI.

Reference

[1] Horn, L. (1989). *A natural history of negation*. Chicago, IL: University of Chicago Press. [2] Gadzar, G. (1979). *Pragmatics: Implicature, presupposition and logical form*. New York: Academic Press. [3] Chierchia, G. (2004). Scalar implicatures, polarity phenomena, and the syntax/pragmatic interface. In A. Belletti (Ed.), *Structures and beyond*. Oxford: Oxford University Press. [4] Guasti, M. T., Chierchia, G., Crain, S., Foppolo, F., Gualmini, A., & Meroni, L. (2005). Why children and adults sometimes (but not always) compute implicatures. *Language and Cognitive Processes*, *20*, 667–696. [5] Huang, Y. & Snedeker, J. (2009). On-line interpretation of scalar quantifiers: Insight into the semantics-pragmatics interface. *Cognitive Psychology*, *58*, 376-415. [6] Noveck, I. A. (2001). When children are more logical than adults: Experimental investigations of scalar implicatures. *Cognition*, *78*, 165-188. [7] Papafragou, A., & Musolino, J. (2003). Scalar implicatures: Experiments at the semantics-pragmatics interface. *Cognition*, 86, 253–282. [8] Levinson, S. (2000). *Presumptive meanings*. Cambridge, MA: MIT Press.
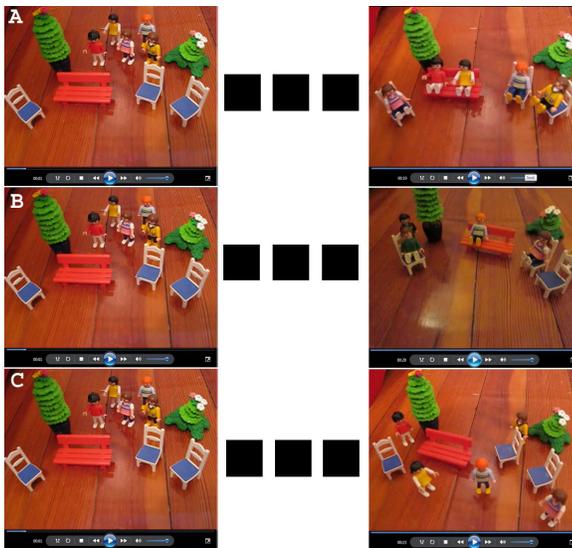
Figure 1: Illustration of the videos used in the experiment, on the left- is the first frame of the video, and on the right is the last frame of the video. (A) shows an "all video" where all the children sat down; (B) shows a "some video" where some of the children sat down; and (C) shows a "none video" where none of the children sat down.
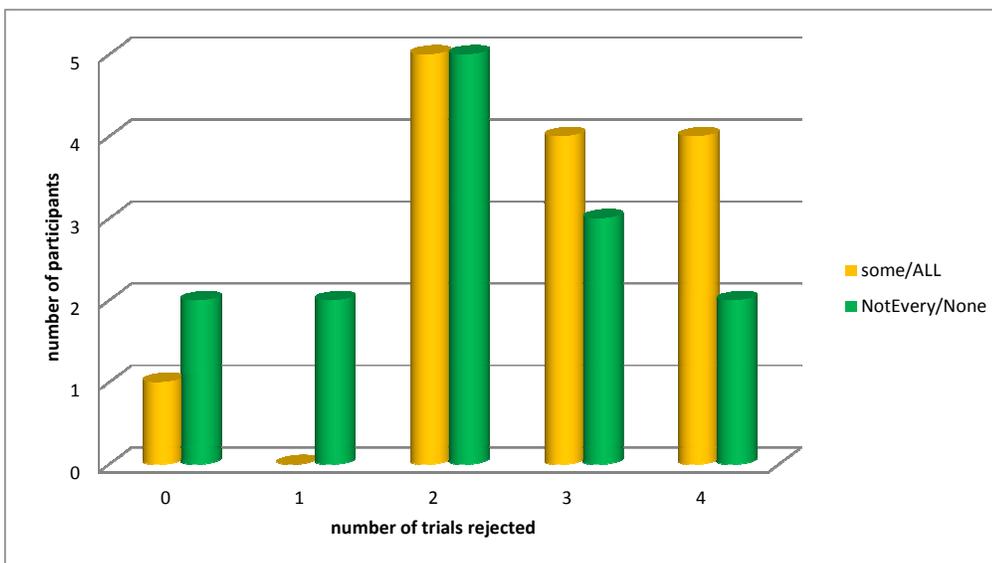

Figure 2: Distribution of children's rejected trials