

## Processing of the Quantifier *kazhdyj* ‘every’ in Russian

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Research in language acquisition has established that children often understand the quantifier *every* in ways different from native adult speakers (Drozd, 2005). Thus, when a Russian sentence (1) is paired with a picture in Fig.D, they erroneously reject this pairing as incorrect.

- (1) *Kazhdyj alligator lezhit v vanne* -- ‘Every alligator lies in the bath tub’ OBJECT  
(2) *V kazhdoj vanne lezhit po alligatoru* -- ‘In every bath tub lies an alligator’ CONTAINER

Roeper (2007) argues that children progress through silent stages of interpreting “*every*”: from applying it to the entire proposition *every [alligator lie bath tub]* to overexhaustively spreading it to both nouns in *every alligator* and *every bath tub* to the adult interpretation. This theory suggests that children should fixate components of the pictures differently if they engage in spreading. The goal of our project is to use the visual world paradigm to investigate the path of acquisition of this quantifier by comparing how adults and children process sentences like (1-2).

We used a speeded sentence-picture matching task (24 trials) contrasting 2 control (one-to-one correspondence between alligators and bath tubs) with 2 experimental conditions:

Control Container (CC):	Fig. A-(2)	Experimental Container (EC):	Fig. C-(2)
Control Object (CO):	Fig. B-(1)	Experimental Object (EO):	Fig. D-(1)

42 monolingual Russian adults (the control group) participated in Experiment 1. Their accuracy, RTs (button-pushes for the sentence-picture matching task) and eye movements were recorded. Surprisingly, there was an interaction in accuracy and RTs: participants were less accurate and slower in **EC** than in **CC** (90%, 3507 ms vs. 98%, 3327 ms) but not in the Object conditions (95%, 3253 ms vs. 93%, 3314 ms), making the **EC** condition the most difficult one.

Linear mixed models allowed us to analyze eye movements by comparing proportions of fixations to (i) extra objects/containers in Fig. C-D with those to distractor objects/containers in Fig. A-B, and (ii) alligator/bath tub pairs separately for the correct (94%) and incorrect (6%) trials. Participants almost exclusively fixated the alligators/tubs/distractors but inspected them differently. To process **CC/EC** “*In every bath tub...*” correctly, listeners needed to focus their attention on the bath tubs. Indeed, those who made errors looked more to the toilets/alligators in incorrect (38%) than in correct trials (24%) suggesting that distractors/extras pulled their attention away from the alligator/bath tub pairs (59% vs. 75%). To process **CO/EO** “*Every alligator...*” correctly, the reverse was true although the effect was modest: checking out distractors/extras ensured the right interpretation in correct (24%) compared to incorrect trials (19%) but the alligator/bath tub pairs did not matter (75% vs. 73%).

These findings constitute the baseline for investigating how Russian children process the same sentences (Experiment 2) especially because of much higher number of incorrect trials. So far, we have completed the accuracy analysis from 32 Russian 6-year-olds and found a main effect of condition: 93% accuracy in control but only 68% in experimental trials (no interaction). Fixation and time course analyses (in progress) promise to deliver an experimental testing of the path of acquisition hypothesis for “*every*” in Russian, in particular, whether children make errors because they “spread” *kazhdyj* ‘every’ over all objects/containers (Roeper, 2007).

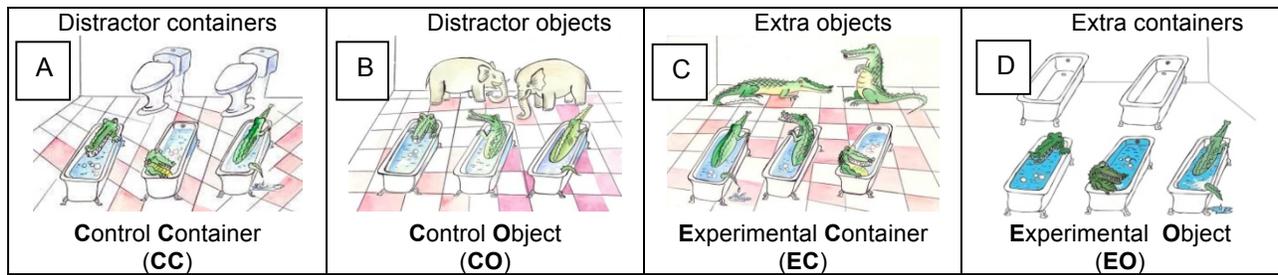


Figure. Examples of four pictures paired with sentences (1)-(2).

## References

- Drozd, K. (2005). Comments from our guest editor. On the acquisition of quantification. *Language Acquisition*, 13(3), 169-175. doi: 10.1207/s15327817la1303
- Roeper, T. (2007). *The Prism of Grammar*. Cambridge, MA: The MIT Press.