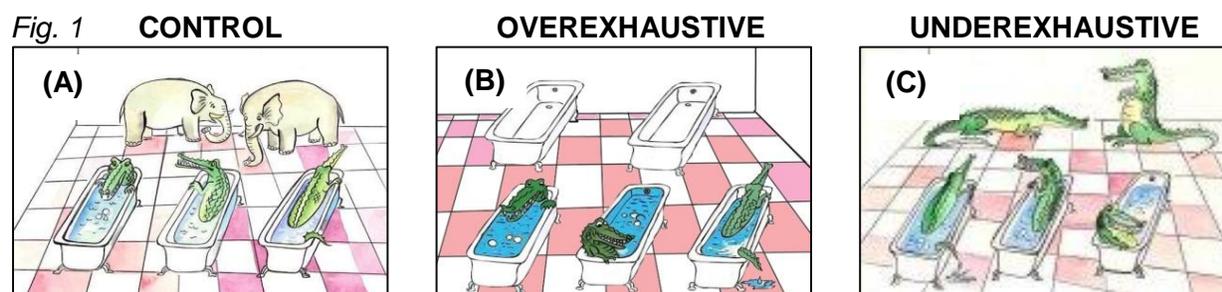


The “Signature” of Q-Spreading Errors in Children and Bilingual Heritage Adults

Method. We investigated online processing of the universal quantifier *kazhdyj* ‘every’ in Russian by three groups—monolingual adult controls, 5-6-year-old children, and bilingual heritage Russian (HL)-English adults using the Visual World eye-tracking. As their eye movements were recorded, participants in each group (*N*s: 40, 31, 30) performed the sentence-picture matching task in which the spoken sentence (1) was paired with a picture in 3 conditions (Fig. 1):

(1) *Kazhdyj alligator lezhit v vanne.*
 Every_{MASC-NOM-SG} alligator_{MASC-NOM-SG} lies_{PRES-SG} in bathtub_{FEM-PREP-SG}.
 ‘Every alligator lies in a/the bathtub.’

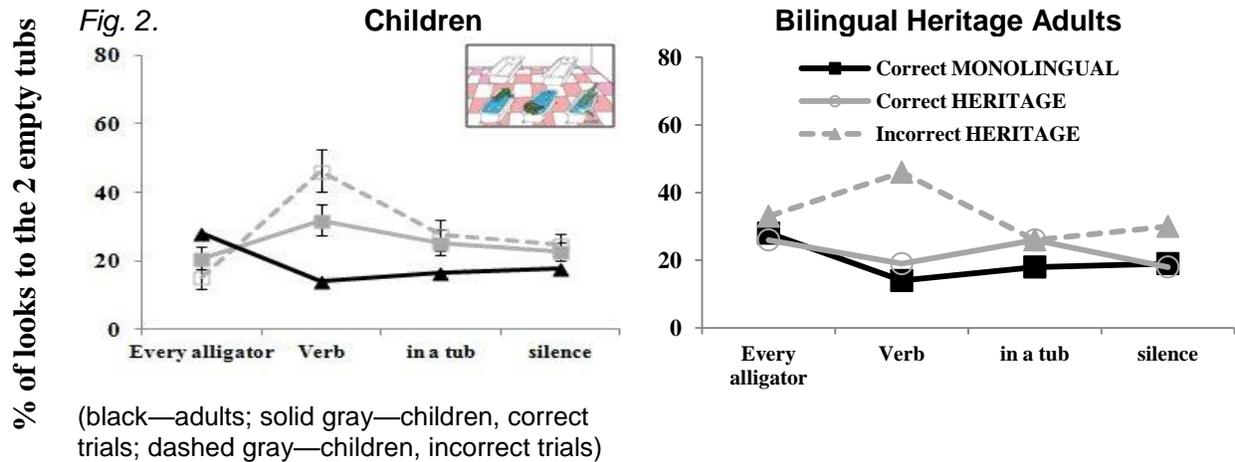


Results. Accuracy (%) in the sentence-picture verification task, RTs (adults only), and patterns of eye movements were analyzed to investigate the impact of visual attention.

Conditions:	Control	Overexhaustive	Underexhaustive
Monolingual adults	95.0	97.0	94.0
Monolingual children	90.0	65.0**	(not run)
Bilingual heritage adults	95.0	81.0*	93.0

Similar to monolingual children (35% errors), the HL speakers made 19% *q*-spreading errors in the Overexhaustive condition, in contrast to the Underexhaustive and the Control conditions (RTs are parallel to the accuracy data). Eye movements in the Overexhaustive condition (Fig. 2) revealed that when both children and bilingual HL speakers engaged in *q*-spreading (incorrect trials), they spent more time looking at the distractors (2 empty bath tubs, Fig. 1B) while listening to the Verb; we argue that this is the signature pattern of *q*-spreading errors.

Discussion. Our results contribute novel empirical evidence to the debate between the representational and processing deficiencies explanations (see Rakhlin, 2007, for review) of *q*-spreading errors for universal quantifiers. Finding such errors in the HL of the bilingual adults was a surprise (the control experiment in English demonstrated absence of *q*-spreading in their dominant language). It suggests that non-adult-like knowledge of quantifier semantics and/or syntax-semantics mapping (Drozd & Loosbroek, 1998; Geurts, 2003; Philip, 1995) is unlikely, as a parsimonious, unifying, explanation should be put forward. We argue that the underlying cause of this deficit in both groups is processing load incurred by the quantified sentences--it exceeds children’s resources and taxes those of HL speakers, along the lines of the inefficient processor idea of O’Grady and colleagues (2011).



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