Irina Sekerina and Luca Campanelli, City University of New York

Interference in Children's Online Processing of simple *Wh*-Questions: Evidence from Russian

There exists theoretical and psycholinguistic evidence that complex syntactic dependencies (Subject relative clauses) are easier for children to comprehend than Object RC, and one theoretical explanation is interference from the intervening Subject. Friedmann et al. (2009) argued that the Obj RC are more difficult <u>only</u> when the moved Object and the intervening Subject DPs share DP-internal features such as gender (Adani et al., 2010). Simple syntactic dependencies such as single clause *wh*-questions are easier than RC: Subj *wh*-questions are easy because there is no movement, and Obj should be also easy if the two DPs share few features. We conducted a Visual World Paradigm experiment in Russian that demonstrates that even when children answer Obj *Wh*-questions correctly, their online processing shows interference from the other present referent (Competitor) regardless of whether it intervenes or not and whether the two DPs are different in features.

Russian adults (*N*=8) and 5-to-7-year-old children (*N*=20) listened to 3-sentence stories while viewing 4 pictures (Fig. 1: *goat, rabbit, hunter, and hole*) and answered a *wh*-question by clicking; their eye movements were recorded (Dickey et al., 2007). Materials were 20 subject- (1a-b) and object- (1c-d) *wh*-questions with different word orders containing unambiguously case-marked *wh*-words (*kto* NOM for Subj, *kogo* ACC for Obj).

(1)		Word Order	**4 Regions of Interest (ms)**				Fig. 1
			1-1000	1001-2000	2001-3000	3001+ ms	
Subject	a.	**Wh$_{SUBJ}$ V O** (canonical):	*Kto*	*spas*	*kozla*	*v jame?*	
			who$_{NOM}$	saved	goat$_{ACC}$	in the hole	
	b.	**Wh$_{SUBJ}$ O V** (scrambled):	*Kto*	*kozla*	*spas*	*v jame?*	
		Intervening Obj	'Who saved the goat in the hole?'				
Object	c.	**Wh$_{OBJ}$ V S** (scrambled):	*Kogo*	*spas*	*zajac*	*v jame?*	
			who$_{ACC}$	saved	rabbit$_{NOM}$	in the hole	
	d.	**Wh$_{OBJ}$ S V** (canonical):	*Kogo*	*zajac*	*spas*	*v jame?*	
		Intervening Subj	'Who$_1$ did the rabbit save __$_1$ in the hole?				

Conditions (1a, d) replicate the English contrast: the Who-Obj (*kogo*) in (1d) is displaced from the post-verbal position and the Subj (*rabbit*) intervenes between the filler and the gap. Conditions (1b, c) are Russian-specific, with the reverse pattern of interference that makes Obj RC easier to process for adults (Levy et al., 2013). We analyzed fine-grained time course of looks to the Target (answer to the question) and Competitor (the other referent) in 4 regions of interest (ROIs; 0-3000 ms).

PREDICTIONS: (1) **Who-Subj (1a-b):** No Subj (*rabbit*) reactivation at the Verb; no interference from Obj (*goat*) in (1b). (2) **Who-Obj (1c-d)**: Obj (*goat*) reactivation at the gap after the Verb; no interference from Subj (*rabbit*) in (1c); interference from Subj in (1d).

RESULTS. Question answers were at ceiling for both groups (98% adults; 99.15% children). Adults' fixations to the Target (Fig. 2, blue lines) were significantly greater than to the Comp starting from the verb in (Fig. 3a-b, d); there were no signs of interference (proportions of fixations to the Comp do not exceed 20% except for 1c). In contrast, children (pink lines) fixated the Comp significantly more in 3 conditions (except 1a) during the first 3 ROIs (0-3000 ms). This interference was strong in the Obj (Fig. 3c, d) and Subj *wh*-question with the interfering Obj (Fig. 3b). Thus, contrary to the lexical restriction theory (Friedmann et al., 2009), children's processing of simple syntactic dependencies is burdened by referential competition even when other DPs do not intervene. This evidence supports the retrieval cue-based theory (Van Dyke & McElree, 2006), according to which effects of interference increase as complexity of syntactic dependencies increases, explaining difficulties children, bilingual speakers, and people with aphasia exhibit in processing RC, passives, and other non-canonical word orders.
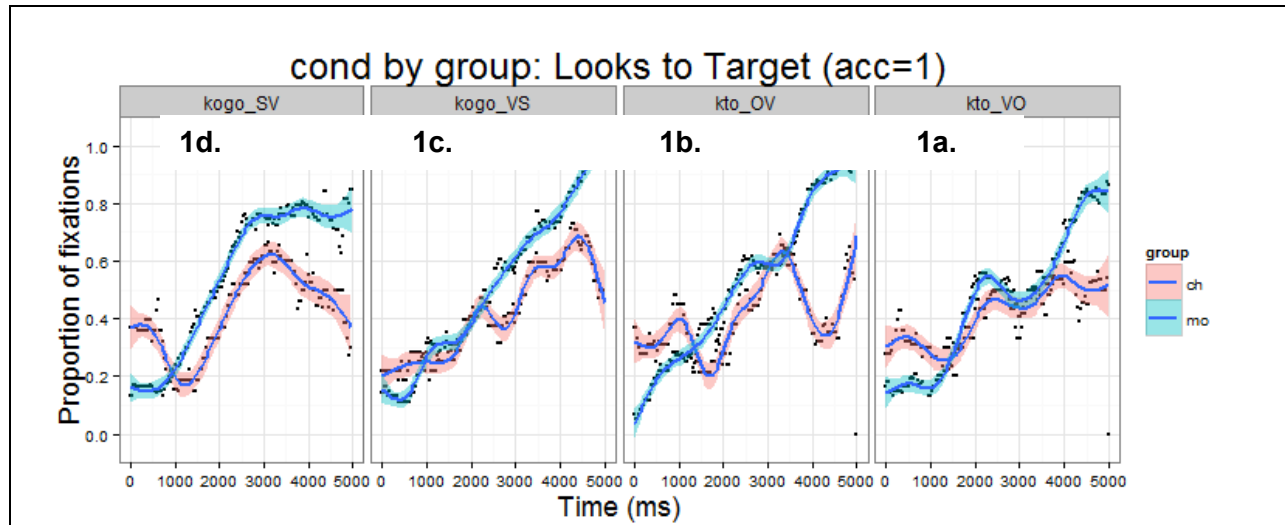
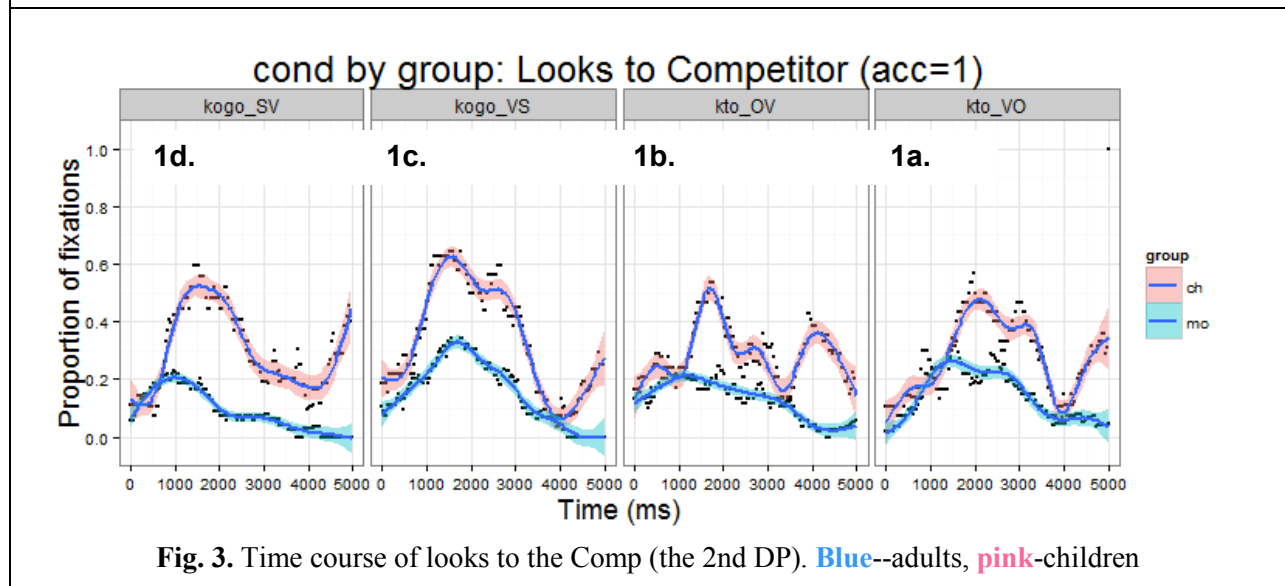**Fig. 2.** Time course of looks to the Target (answer to the question). **Blue**--adults, pink-children

Fig. 3. Time course of looks to the Comp (the 2nd DP). **Blue**--adults, pink-children

REFERENCES

Adani, F., van der Lely, H. K. J., Forgiarini, M., & Guasti, M. T. (2010). Grammatical feature dissimilarities make relative clauses easier: A comprehension study with Italian children. *Lingua, 120*, 2148-2166.

Dickey, M. W., Choy, J. J., & Thompson, C. K. (2007). Real-time comprehension of wh-movement in aphasia: Evidence from eyetracking while listening. *Brain and Language, 100*, 1-22.

Friedmann, N., Belletti, A., & Rizzi, L. (2009). Relativized relatives: Types of intervention in the acquisition of A-bar dependencies. *Lingua, 119*, 67-88.

Levy, R., Fedorenko, E., & Gibson, E. (2013). The syntactic complexity of Russian relative clauses. *Journal of Memory and Language, 69*, 461-495.

Van Dyke, J. A., & McElree, B. (2006). Retrieval interference in sentence comprehension. *Journal of Memory and Language, 55*, 157-166.