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Agreement groups and dualistic syntactic processing

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We would like to draw attention to the dualistic characteristics of the Agreement Groups (AG) model of linguistic processing, a distributional approach based on the cognitive mechanisms of storing groups of similar utterances in memory, and mechanisms for mapping utterances onto such groups.

Agreement groups, i.e. groups of utterances differing from a base utterance in only one word, provide a means for processing novel utterances on the basis of utterances already encountered. Analysing 2-5 word long English mother-child utterances, Drienkó (2012a, 2014) found that at any stage of linguistic development the agreement groups extracted from the body of utterances encountered up to that point can account for a certain proportion of the utterances (novel, and non-novel) of the stage in question. Similar results were reported for Hungarian and Spanish (Drienkó 2013a). The maximum proportion of English utterances that were compatible with AG's was 41%.

For the processing of longer sequences the notion of 'coverage' was introduced in Drienkó (2013b, 2015). The basic idea is to break down utterances into shorter (2-5 word long) fragments which are compatible with AG's. Fragments then can "cover" the longer utterance. The author found 78% and 83% average coverage values for the "continuous" and the "discontinuous" case, respectively.

In terms of linguistic modelling the results suggest at least two basic levels of processing. The first level corresponds to direct mappings onto AG's. Shorter utterances, holophrases, formulaic expressions can be handled relatively readily here. The second level requires more computational efforts since first legal (i.e. AG-compatible) fragments have to be found (Level 1 operation), then an optimal combination of fragments must be selected in order to effect grammaticality. This duality is reflected in the "coverage structure" of utterances. Drienkó (2016) proposes a "continuum" model of linguistic generalisation based on the operations and generalisation objects associated with the two major levels and their possible sublevels. The model may have parallelisms with the dual-process model of Van Lancker Sidtis (2008) based on holistic and analytic levels of processing for formulaic and novel utterances, respectively, and schemata representing the interplay of the two levels.

The AG approach may accord with neurological findings. For instance, Bahlmann & Friederici (2006) documented different ERP components for the processing of sequences of different structural types, namely, AB^n sequences from a Finite State Grammar and A^nB^n sequences from a Phrase Structure Grammar. In the AG framework this dichotomy could be explained in terms of 'continuous' and/or 'discontinuous' coverage: as for AB^n utterances, continuous AB fragments can cover any sequence, whereas A^nB^n sequences require n-1 discontinuous fragments. Discontinuity, in turn, involves a computationally more complex process in the AG model. Cf. Table 1 and Table 2, also the difference in coverage effectiveness, 78% vs. 83%, for the experiment mentioned above.

a1	b1	a2	b2	a3	b3	a4	b4
a1	b1						
		a2	b2				
				a3	b3		
						a4	b4

Table 1

a1	a2	a3	a4	b4	b3	b2	b1
			a4	b4			
		a3			b3		
	a2					b2	
a1							b1

Table 2

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