

Processing pluralities: syntax and the lexicon

Jakub Dotlačil (CLCG Groningen) & Adrian Brasoveanu (UCSC)

j.dotlaci@gmail.com

Previous research: Sentences with pluralities can receive at least two interpretations. For example, *John and Bill lifted one box* could be true if the boys lifted one box jointly (**collective** reading), or if the boys individually lifted a box, i.e., there were two lifting events and two boxes might have been lifted in total (**distributive** reading). Frazier et al. (1999) showed in an eye-tracking experiment that the processor prefers the collective interpretation. This finding was confirmed in Kaup et al. (2002) and Boylan et al. (2011).

New study: In semantics, two types of distributivity/collectivity are standardly distinguished: **lexical** and **phrasal**. In the former case, the distributivity/collectivity targets a word and could be seen as a purely lexical phenomenon: e.g., in *the boys won*, the interpretations "{each boy / the group of boys} won" can be derived just from the vagueness of *won*, i.e., from the fact that *won* can be true of groups or individuals. Phrasal distributivity cannot be specified in the lexicon: in *the boys won an award*, the interpretation that each boy won a different award requires us to assume that the whole predicate (verb + indefinite) is interpreted distributively when composed with the subject. Phrasal distributivity is derived with the help of a **dist** operator requiring the combination of a predicate and its subject to be interpreted distributively (Winter, 2000, Kratzer, 2013, a.o.). The distinction between phrasal and lexical distributivity/collectivity, known in semantics, was ignored in previous psycholinguistic research. Our study is the first to take it into account.

Experiment: We ran a self-paced reading experiment in a 2x2x2 design (see one item in (1)). As in Frazier (1999), every item included disambiguators: either the **distributive** adverb *individually*, or the **collective** adverb *collectively*. The disambiguators appeared **pre-verbally**, (1-a), or **post-verbally**, (1-b). The main novelty of the experiment was the manipulation of the **presence / absence** of the object (all predicates were chosen to allow object drop), which tested the difference between lexical and phrasal distributivity. The experiment was run on a locally hosted installation of the IBEX platform (51 subjects, 32 items, 96 fillers). Analyzing the data using mixed-effects regression with residualized log times as the dependent variable, we found that the **post-verbal distributive** disambiguator caused a slowdown when the object was **present**, i.e., in the case of phrasal distributivity. The effect was significant on the 3rd word after the predicate (*science* in (1); $t = 3.1, p < .01$). No other cost of disambiguation towards distributivity was detected.

- (1) a. The girls individually/collectively won (an award) during the science fair.
b. The girls won (an award) individually/collectively during the science fair.

Discussion: The findings are compatible with the position that the processor dis-prefers phrasal distributivity. Distributivity *per se* is not dispreferred since no general cost of post-verbal distributive disambiguation was seen. The results provide evidence for two distributivity types in grammar. They are compatible with the hypothesis that only phrasal distributivity requires a distributivity operator in syntax (under the assumption that the human parser prefers minimal syntactic structures -- Minimal Attachment, Frazier, 1978, a.o.).