The effects of input typicality (or variability) on the acquisition of argument structure constructions

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Partial productivity of argument structure constructions poses a major challenge to language learners (Pinker 1989). It is acknowledged that learners can generalize over individual sentences like *John pulled the drawer open* and add an abstract form-and-meaning representation or *construction* to their mental grammar such as [NP$_x$ verb NP$_y$ RP$_z$] meaning 'X makes Y become Z (by verb-ing)' (Goldberg 1995). Then, they can use it productively with other verbs and result phrases such as *Tom pushed the door shut*. At the same time, however, they are expected not to produce odd sentences such as *John scolded Tom unhappy* to mean 'John makes Tom unhappy by scolding him.' It is not clear yet how learners eventually learn and use an abstract construction while avoiding such errors. The present study investigates the nature of language input that can facilitate the generalization and production of an argument structure construction called the resultative construction by varying the typicality (or variability) of verbs and result-phrases, respectively.

We conducted two experiments on two groups of subjects (L1 Korean), i.e. advanced and high-intermediate English learners based on test scores such as TOEFL. The experiments consisted of a reading phase and a test phase while no explicit teaching was involved. In Experiment 1, we tested one of the most influential proposals in the acquisition of argument structure constructions that the acquisition is driven by the most typical and frequent verb of the construction, e.g. *give* for the ditransitive construction and *make* for the resultative construction (Boas 2011). Two sets of nine stimuli were prepared to test the proposal (Table 1). One set contains nine resultative sentences with three different verbs (*pull*, *rub* and *kick*) paired with three different result phrases, respectively; the other set used the same verb *make* across the nine stimuli. Each resultative sentence is preceded and followed by a context sentence to help readers capture the meaning of the resultative sentences in a natural way (an example in (1)). In the reading phase, participants read the stimuli, each followed by a comprehension question; in the test phase, they were presented with a short video clip (snapshots of an example video in (2)) and asked to describe the event occurring in the video most preferably in a single sentence. We annotated the production data as to whether they used the resultative construction in describing the event or not.

In Experiment 2, we further investigated the role of variability (or typicality) in verbs and result phrases by manipulating the number of verbs and result phrases in the input. We tested whether the variability (or typicality) of the verbs or that of result phrases is more effective in facilitating the acquisition of the resultative construction. We prepared a third set of nine stimuli where one result phrase is paired with three different verbs and compared it with the first set in Experiment 1 (Table 1). Namely, in the reading phase, participants were exposed to 3 verbs x 9 RPs in the verb-centered condition and to 9 verbs x 3 RPs in the result-centered condition. All other settings were kept constant across the two experiments.

The results showed that subjects produced significantly fewer resultative sentences in the *make*-only exposure condition than in the resultative exposure condition (*b*=-1.355, *p*<.05) in Experiment 1 and they also produced fewer resultatives in the result-centered condition than in the verb-centered condition (*b*=-1.27, *p*<.05) in Experiment 2. In both experiments, advanced learners produced more resultative sentences than high-intermediate learners. Our results disconfirm the previous contention that the *make*-construction plays the key role in the acquisition of the resultative construction (Exp 1) and support that subjects tend to make verb-centered generalization in learning resultatives (Exp 2). Our study provides empirical evidence on the effect of typicality/variability on the acquisition of the resultative construction and also suggests that exposure to a small set of different verbs with some repetition is crucial in facilitating the argument structure acquisition.

Example stimuli:

(1) Learning phase (reading & comprehension): a stimulus consisting of three sentences

*The detective suspected the woman concealed the jewelry in the drawer. <u>He **pulled** the drawer **open**</u> to see what was inside. He found the diamond watch in there.*

(2) Test phase (production): snapshots of a video stimulus (about 15 sec.) with captions

It's a circle. This is painting. The circle is red.

Table 1. Verb & result-phrase pairings in stimuli for each condition

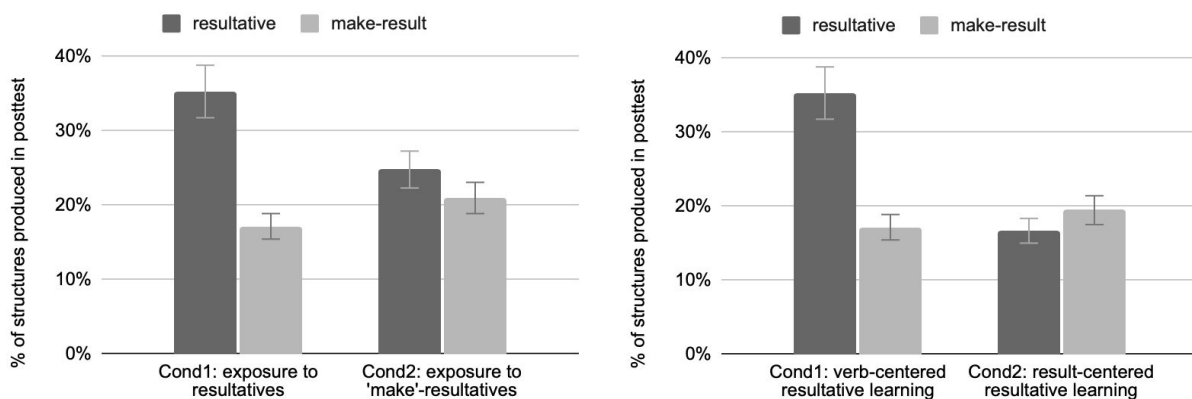| Condition 1 in both Experiments 1 & 2		Condition 2 in Experiment 1		Condition 2 in Experiment 2	
Verb	Result phrase	Verb	Result phrase	Verb	Result phrase
pull	open	make	open	pull	open
	shut		shut	push	
	loose		loose	break	
rub	clean		clean	rub	clean
	dry		dry	wipe	
	smooth		smooth	sweep	
kick	dead		dead	kick	dead
	high		high	knock	
	unconscious		unconscious	shot	

Figure 1. Percentages of resultatives in Experiments 1 & 2 (advanced+high-intermediate)

References

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Goldberg, Adele E. (1995). *Constructions: a construction grammar approach to argument structure*. UCP.

Pinker, S. (1989). Learnability and cognition: the acquisition of argument structure. MIT Press.