

## The Effect of Givenness on the Dative Alternation in Norwegian: A Reaction Time Study

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The question of what determines the choice of word order in ditransitives has been a long standing one. Several factors have been shown to affect the order of the objects. For example, results from self-paced reading tasks and reaction timed (RT) grammaticality judgements in English and Danish reveal that the double object dative (DOD, *Erik gave **the girl** a car*) is better when the recipient is given than when the theme is given, while the prepositional dative (PD, *Erik gave **the car** to a girl*) is found to be insensitive to givenness (Bridgwater et al. 2019; Brown et al. 2012; Clifton & Frazier, 2004; Kizach & Balling, 2013). As a result, PD has been argued to be the canonical order. Furthermore, the fact that both word orders are generally accepted suggests that this preference is due to information structure rather than grammaticality.

The current study investigates the alternation between PD and DOD to test whether the same sensitivity to information structure can be found in the dative alternation in Norwegian. We ask: (i) To what extent are ditransitive structures that violate the given-before-new principle accepted as grammatical in Norwegian? (ii) Is this reflected in RTs as in Danish and English? And, (iii), how are violations of given>new perceived when the given object is realized by a pronominal object as opposed to a DP? We designed a speeded grammaticality judgement task in Open Sesame, with a 2x2x2 design (structure, givenness, referring expression- table 1). All test sentences were preceded by a context (examples 1&2) introducing one of the object arguments; RTs were measured from when the test sentence appeared on the screen. The participants had to rate the sentences as either “good” or “bad”. A total of 96 ditransitive structures were tested on 32 adult native speakers of Norwegian.

The results are summarised in table 2 and reveal both similarities and differences with previous studies. DODs appear to be more sensitive to information structure than PDs in Norwegian as well: theme-given DODs were consistently regarded as less acceptable (63% and 44%), while recipient-given PDs were judged as less acceptable only when the theme was realised by a pronoun (73%). A linear mixed effects analysis revealed that for both structures new>given orders have lower acceptancy rates, this is however more pronounced for the DOD (p-value  $6.33e^{-16}$  vs.  $0.000377$ ). Further, our statistical analysis also revealed that items violating given>new are significantly slower than orders obeying this principle: p-value= $0.001813$  for PD and p-value= $0.000539$  for DOD; this means that PDs are also context dependent, even if considerably less so than DODs. For PDs, this is surprising, as previous research has shown no tendency related to word order with these structures. We also ran an analysis on the two referring expressions separately, having the structure as a fixed effect which revealed that PDs are faster than DODs with DP items (p-value  $1.99e^{-15}$ ), but are significantly slower with pronominal items (p-value  $0.00714$ ).

We conclude that violations of the given>new principle with DODs seem to be less acceptable in Norwegian than in Danish and English (more items judged as “bad”); second, RTs reveal that PDs are also sensitive to information structure (slower RTs when given>new violation); and third, the type of referring expression clearly plays a role when it comes to how degraded violations of givenness principles are considered (both on RTs and acceptance ratio). This shows that pronouns play an important role for word order in ditransitives, something that the previous studies missed due to the inclusion of only DP objects. The canonical status of the PD may need to be re-evaluated in light of this, at least for Norwegian.

Structure	Given	Referring exp	Target
DOD	THEME	DP	He gave a cat the tuna.
PD	THEME	DP	He gave the tuna to a cat.
DOD	RECIPIENT	DP	He gave the cat tuna.
PD	RECIPIENT	DP	He gave tuna to the cat.
DOD	THEME	Pr	He gave a cat it.
PD	THEME	Pr	He gave it to a cat.
DOD	RECIPIENT	Pr	He gave it tuna.
PD	RECIPIENT	Pr	He gave tuna to it.

Table 1: 2x2x2 design of the test sentences

- (1) Eric was cleaning out the fridge and found **an open can of tuna**. He was unsure whether **it** was good enough to eat, but he also didn't want to throw **it** away. [THEME-GIVEN]  
(2) Eric was woken up by **a cat** meowing under his balcony. **The cat** was small and cute, and Eric wanted to help **it** so... [RECIPIENT-GIVEN]

Structure	Realization of given objects	Recipient given (IO)		Theme given (DO)	
		RT (ms)	% Accepted	RT (ms)	% Accepted
DOD	Definite DP	3528	92 %	4048	63%
PD	Definite DP	3057	92%	2730	98%
DOD	Pronoun	2811	98%	3366	44%
PD	Pronoun	3319	73%	3223	95%

Table 2: Mean RTs and acceptance rates; (the pragmatically felicitous conditions are shaded)

**References:** **Bridgwater, Kyröläinen & Kuperman** (2019). The influence of syntactic expectations on reading comprehension is malleable and strategic: An eye-tracking study of English dative alternation. *Canadian Journal of Experimental Psychology*, 73(3), 179-192. **Brown, Savova & Gibson** (2012). Syntax encodes information structure: Evidence from on-line reading comprehension. *Journal of Memory and Language*, 66(1), 194-209. **Clifton & Frazier** (2004). Should given information come before new? Yes and no. *Memory & Cognition*, 32(6), 886-895. **Kizach & Balling** (2013). Givenness, complexity, and the Danish dative alternation. *Memory & Cognition*, 41(8), 1159-1171.