

When syntactic complexity shifts the subject preference in an SOV language: Processing [OV]S vs. [SV]O sentences in Turkish

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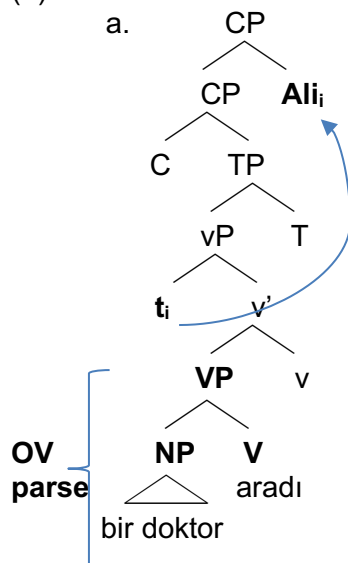
Introduction. Word order of a language might be rigid (e.g. English) or flexible (e.g. Turkish). Non-canonical orders in flexible word order languages have been shown to be difficult to process in isolation [1,2,3]. Some have attributed this to their syntactic complexity assuming a movement-based derivation [2,4] while others to their discourse dependence [1,5]. **Current study.** We focus on processing of two non-canonical orders in an SOV language: OVS and SVO orders in Turkish where the initial noun is string-wise ambiguous between a bare object and a nominative subject (*bir doktor* ‘a doctor’ in 1). Previously, an ambiguous initial noun has been shown to be processed faster when it disambiguates at the verb as the subject compared to the object [9]. Crucially, in this study the disambiguation region is the second argument in the postverbal position in nominative or accusative form (*Ali/Ali-yi* in 1). Thus, the ambiguity involves the verb. Importantly, this means the parser can revise the initial ‘subject of an intransitive verb’ interpretation to ‘object of a transitive verb’ before reaching the disambiguation region. Based on previous research on the syntactic properties of bare objects in Turkish [6,7,8], we hypothesized that the OVS order is syntactically simpler than the SVO order since a bare object is thought to stay VP-internal, resulting in a smaller syntactic unit, but an external argument (i.e., subject) is not (2a-b). **Questions.** Our research questions were: i) Does the parser prefer one noncanonical order over the other when both are presented in isolation? ii) If yes, is it the syntactically simpler one? iii) Does this preference change when both are presented with contextual cues? Syntactic complexity-based approaches like the Minimal Chain Principle [4] would predict that the syntactically simpler one (i.e.OVS) is the initial parse and the contextual cue only facilitates reanalysis (from OVS to SVO). On the other hand, discourse dependence approaches [1,5] would predict the two orders to be processed at equal difficulty with or without context as both are noncanonical with similar context requirements; in both orders the preverbal argument is new while the postverbal is old information. **Methods.** There were two self-paced reading experiments; each consisted of 24 filler and 24 experimental items. In experiment 1, word order (OVS vs. SVO) was the one factor manipulated, resulting in 2 conditions. Experiment 2 had a 2x2 within subjects factorial design with factors of word order (OVS. vs. SVO) and context (supporting vs. unsupporting), with 4 conditions in total. Agent oriented purpose clauses were added at the beginning of the experimental items used in experiment 1 (after a separate norming study). As contextual cues, these made either the subject+verb (i.e. [SV]O) or the object+verb (i.e. [OV]S) parse for the ambiguous region more plausible(3). For example, “In order to get examined on his/her heart” supported the OV parse for the bare object *bir doktor* ‘a doctor’ with the verb *arıyordu* ‘looking for’ while “In order to examine his/her heart” cued the SV parse with *bir doktor* ‘a doctor’ as the subject. Participants were native speakers of Turkish (N=24 in each). Excluding 1 participant due to low accuracy rate to comprehension questions, data from 23 participants were analyzed in each experiment. Reading times were log transformed and residualized to word length. **Results.** In both experiments, there was an increase in RTs at the disambiguation (“Ali/Ali’yi”) and the spill-over (“diye”) regions. This effect was greater for SVO sentences in both experiment 1(Fig.1a) and experiment 2(Fig.2a). A mixed-effects model on the spill-over data revealed a marginal word order effect ($p=0.059$) in experiment 1(Fig.1b). In experiment 2, the same region revealed main effects of word order ($p=0.0001$) and context ($p=0.005$), which are qualified by the interaction ($p=0.04$). These results suggest that both word orders were processed slower in unsupporting contexts, especially the SVO order. (Fig.2a-b). **Conclusions.** The results show that the subject (of an intransitive verb) preference for an ambiguous initial argument in Turkish can be shifted to the object (of a transitive verb) when it yields a syntactically simpler parse (i.e. OV). This provides supporting data for processing theories like MCP that put syntactic complexity before any contextual effect while posing a problem for discourse dependence approaches. As both orders are noncanonical with the

Background on word order in Turkish. The canonical word order in Turkish is SOV(4). It is possible to embed a simplex finite complement clause with the complementizer *diye* ‘that’ under a verb like *duy-* ‘hear’. Turkish is also a pro-drop language for the subject. The main clause subject *ben* ‘I’ was dropped in our experimental items and the OVS or SVO finite clauses were embedded clauses to produce the spill-over regions needed in a natural way(5). The non-canonical orders have been analyzed to be derived with leftward movement by some [10] and via rightward movement by some others[11,12]. Either way, the preverbal noun stays inside the VP only when it is the bare object and results in a simpler syntactic structure(6a-b). Assuming rightward movement to keep things simple here, representations of the derivations in (2a) and (2b) would be as in (6a-b). These representations also assume no EPP movement for the subject, but this is an assumption again made for simplification and would not affect the main analysis.

- (4) (S) Ali (O) bir doktor (V) aradı.
 Ali.nom a doctor looked.for
 ‘Ali looked for a doctor.’

- (5) Dün (ben) [**Ali bir doktor aradı**] diye duydum.
 yesterday I.nom Ali.nom a doctor looked.for that I.heard
 ‘Yesterday, (I) heard that Ali looked for a doctor.’

- (6) **OVS:**



- SVO:**

