

## Parsing case in the face of ditransitive garden paths: Reading time evidence from Georgian

**Introduction:** An active parsing strategy often forces native adult comprehenders to take calculated risks during incremental processing [1]. Given the disproportionate interpretive weight of verbs' lexical semantics in the comprehension of a typical clause, verb-final structures pose a particular challenge to active comprehenders seeking to efficiently establish a clause's fundamental syntactic–semantic dependencies. Processing studies on the comprehension of these core grammatical relations (GRs) has been conducted in a small but rapidly growing set of languages. However, even though psycholinguistic theories (e.g., eADM [2]) can make clear predictions about a wide range of GRs, rarely have ones beyond transitive subject (S) and direct object (O) been directly addressed in the design of previous studies. This abstract describes ongoing research broadening the understanding of GR parsing strategies by investigating when comprehenders of Georgian are compelled to posit an indirect object (IO).

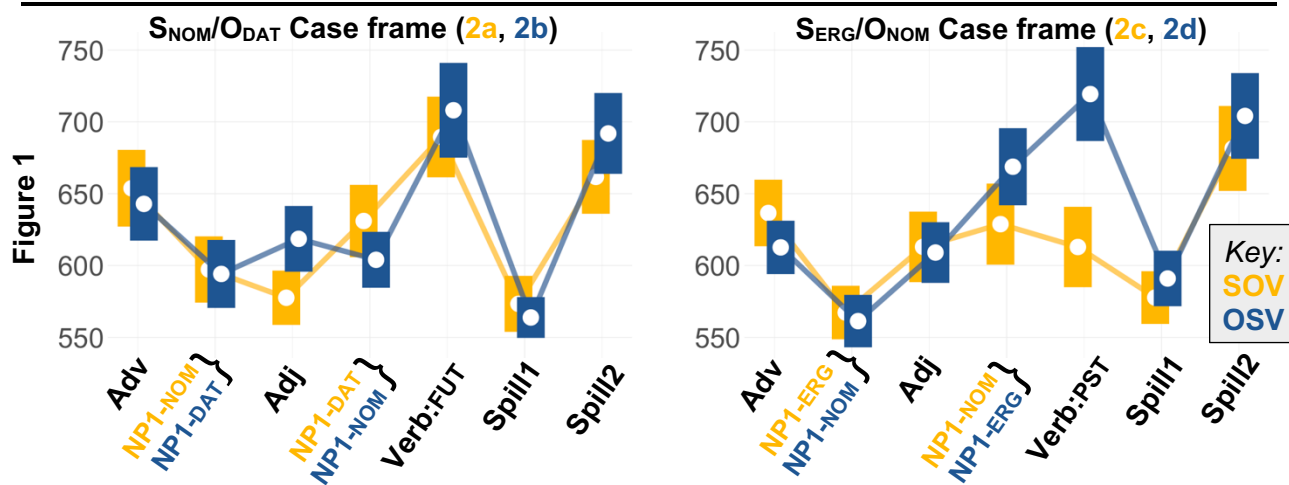
**Grammatical background:** Georgian is a flexible word-order language with a baroque split-ergative case system that manifests in the case alignment of Ss, Os, and IOs [3]. There are three major case frames, each licensed by a certain tense; Tables in (1) summarize. There are only three core cases (NOMinative, ERGative, and DATive), which differ greatly in specificity: ERG is unique to PST-tense S; NOM is found on S and O; DAT on S, O, and IO. Combined with flexible word order and null pronouns, this split-ergative case system frequently results in hurdles to active comprehenders — often, it forces them to choose between possible continuations with radically different interpretations. For example, a preverbal “NP<sub>NOM</sub> – NP<sub>DAT</sub>” sequence is compatible with a future-tense SOV parse (i.e., S<sub>NOM</sub>O<sub>DAT</sub>V<sub>FUT</sub>), a perfect-tense OSV parse (O<sub>NOM</sub>S<sub>DAT</sub>V<sub>PERF</sub>), and also a number of ditransitive parses (including S<sub>NOM</sub>IO<sub>DAT</sub>V<sub>DITR.FUT</sub>O<sub>DAT</sub>).

**Previous findings:** The ramifications of Georgian split ergative for incremental processing have been investigated from several methodological and grammatical angles [e.g., 4,5]. A consistently observed set of effects suggests that Georgian comprehenders are easily garden pathed into S-initial parses. A pair of recent studies [6] add nuance to this picture by comparing RTs across clauses with a variety of carefully controlled incremental GR-ambiguities. Design & results are summarized briefly here. Two self-paced reading experiments (N<sub>SUBJ</sub>=41) conducted via Ixby Farm [14] tested Georgian comprehenders' parsing strategies. In each, 28 itemsets were constructed in a 2×2 design, crossing Case Frame (S<sub>NOM</sub>/O<sub>DAT</sub> or S<sub>ERG</sub>/O<sub>NOM</sub>) and Word Order (SOV or OSV) of simple root clauses. Stimuli for Exp. 1 had only human-denoting arguments; a sample itemset is given in (2). Stimuli for Exp. 2 had an identical design but only inanimate arguments. The experiments were run simultaneously, among 52 other filler sentences. RT data from Exp. 1 are shown in Fig. 1; the key finding is a case–order interaction at the verb region ( $t = -2.29$   $p < 0.05$ ); verbs are read faster in S<sub>ERG</sub>O<sub>NOM</sub>V<sub>PST</sub> clauses (2c) than any other. Slow OSV verbs are expected (they foil S-initial parses), but the slow S<sub>NOM</sub>O<sub>DAT</sub>V<sub>FUT</sub> verb (2b) is surprising.

**Planned research:** A suite of reading-time experiments has been designed to follow up on a specific interpretation of the slowdown in (2b): one which explicitly considers a wider array of GRs. Specifically, if S, O, and IO are all countenanced when parsing an ambiguous preverbal NP, then certain strings can lead comprehenders down ditransitive garden paths. As described above, the DAT-case NP2 in a S<sub>NOM</sub>O<sub>DAT</sub>V<sub>FUT</sub> clause (2a) can be incorrectly parsed as an IO. It is hypothesized that this extra GR ambiguity contributes to the unexplained elevated RTs at the verb region for the future SOV condition (2b). This hypothesis will be tested in four-condition study whose design is sketched in (3). The strength of the S-initiality preference will be tested by comparing RTs across FUT-tense OSV clauses (3a) and PERF SOV ones (3b), which have identical preverbal strings. The strength of a potential IO-garden path effect induced by preverbal DAT NPs will be tested by comparing FUT monotransitive S<sub>NOM</sub>O<sub>DAT</sub>V clauses (3c) to FUT ditransitive S<sub>NOM</sub>IO<sub>DAT</sub>V clauses (3d). Besides Study (3), we also intend to replicate [6]'s monotransitive-only studies with refined designs. Data collection is anticipated to begin within a few months.

(1)		S	IO	O		S	IO	O
	Future	NOM	DAT		ERG	Past	—	
	Past	ERG	DAT	NOM	NOM	Future	—	Past, Perf.
	Perfect	DAT	(PP)	NOM	DAT	Perfect	Fut., Past	Future

- (2) a. *dġes sŧumar-i kera xuro-s gaaxarebs ketili sačukr-it.* **S<sub>NOM</sub>O<sub>DAT</sub>V**  
today guest-NOM blond carpenter-DAT gladden.FUT kind gift-INST  
“Today the guest will gladden the blond carpenter with a kind gift.”
- b. *dġes sŧumar-s kera xuro gaaxarebs ketili sačukr-it.* **O<sub>DAT</sub>S<sub>NOM</sub>V**  
today guest-DAT blond carpenter.NOM gladden.FUT kind gift-INST  
“Today the blond carpenter will gladden the guest with a kind gift.”
- c. *dġes sŧumar-ma kera xuro gaaxara ketili sačukr-it.* **S<sub>ERG</sub>O<sub>NOM</sub>V**  
today guest-ERG blond carpenter.NOM gladden.PST kind gift-INST  
“Today the guest gladdened the blond carpenter with a kind gift.”
- d. *dġes sŧumar-i kera xuro-m gaaxara ketili sačukr-it.* **O<sub>NOM</sub>S<sub>ERG</sub>V**  
today guest-NOM blond carpenter-ERG gladden.PST kind gift-INST  
“Today the blond carpenter gladdened the guest with a kind gift.”



- (3) a. *msaxiob-s mçeral-i daarçmunebs čemi švil-is ničiereba-ši.* **O<sub>DAT</sub>S<sub>NOM</sub>V**  
actor-DAT writer-NOM convince.FUT my child-GEN talentedness-in  
“The writer will convince the actor of my child’s talent.”
- b. *msaxiob-s mçeral-i daurçmunebia čemi švil-is ničiereba-ši.* **S<sub>DAT</sub>O<sub>NOM</sub>V**  
actor-DAT writer-NOM convince.PERF my child-GEN talentedness-in  
“The actor has convinced the writer of my child’s talent.”
- c. *msaxiob-i mçeral-s daarçmunebs čemi švil-is ničiereba-ši.* **S<sub>NOM</sub>O<sub>DAT</sub>V**  
actor-NOM writer-DAT convince.MONO my child-GEN talentedness-in  
“The actor will convince the writer of my child’s talent.”
- d. *msaxiob-i mçeral-s daurçmunebs švil-s čems ničiereba-ši.* **S<sub>NOM</sub>IO<sub>DAT</sub>V**  
actor-NOM writer-DAT convince.DITR child-DAT my talentedness-in  
“The actor will convince the child (DO) of my talent for the writer (IO).”

**References:** [1] Frazier 1987; [2] Bornkessel–Schlesewsky & Schlesewsky 2009. *Processing syntax and morphology*; [3] Aronson (1990). *Georgian: A reading grammar*; [4] Skopeteas et al. (2012). Case inversion in Georgian: Syntactic properties and sentence processing. *Case, Word Order, and Prominence*. [5] Foley & Wagers (2017). Subject gaps are still easiest: Relative clause processing and Georgian split ergativity. CUNY Poster. [6] Foley (2020). PhD dissertation, UCSC.