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Title. Relative clause processing in Tongan: an effect of syntactic ergativity on the object preference

Introduction. In the psycholinguistic literature, it has been found that the processing cost for the subject relative clauses (SRC) is lower than that for the object relative clauses (ORC) in many languages (Kwon, et al., 2010, for review). At the same time, the set of languages that have been investigated in the psycholinguistic field in general is quite small and widening the linguistic diversity is called for (Anand, et al., 2011). Our study examined the relative clause processing in Tongan (Austronesian, Tonga), a V-initial language with syntactic ergativity. A self-paced reading experiment shows that Tongan has the ORC preference over the SRC.

A handful of studies have examined processing of relative clauses in V-initial languages (Tagalog; Tanaka, 2016; Chamorro; Wagers, et al., 2018) and ergative languages (Avar; Polinsky, et al., 2012; Basque; Carreiras, et al., 2010). While Chamorro, a V-initial language, showed the subject advantage, Avar and Basque showed the absolutive case (ABS) advantage; Avar additionally showed the subject advantage. Because these languages have SOV word-order and pre-nominal relative clauses, the observed “ABS advantage” may come from the bias for the linearly-short dependency. On the other hand, Tongan is V-initial and has post-nominal relative clauses. In other words, the absolutive object is not only structurally distant, but also linearly distant from the head noun. Therefore, Tongan is a great testing ground for delineating or defining the possible causes of the ABS advantage (i.e. the ORC preference) in the relative clause processing. Furthermore, unlike Avar and Basque, Tongan exhibits “syntactic” ergativity in addition to “morphological” ergativity.

Syntactic Ergativity. Tongan exhibits syntactic ergativity in relative clause structures. As shown in (1a), when a transitive subject (ergative NP) is relativized (SRC), the pre-verbal resumptive pronoun (RP) *ne* must be present; on the other hand, as shown in (1b), when a transitive object (absolutive NP) is relativized (ORC), such an RP cannot appear.

- (1a) 'a e tōketā [na'a *(ne) taa'i ____ 'a e neesi].
 ABS doctor PST 3sRP hit ABS nurse "the doctor who hit the nurse"
- (1b) 'a e tōketā [na'e (*ne) taa'i 'e he neesi ____].
 ABS doctor PST 3sRP hit ERG nurse "the doctor who the nurse hit"

Because relativization of ergative argument involves an extra grammatical complexity, we could hypothesize that Tongan exhibit the ABS advantage.

Experiment. Sixty-one native speakers of Tongan participated in the study. They are students and staff members at the University of South Pacific, Tonga campus. Sixteen sets of SRC target sentence pairs and sixteen sets of ORC target sentence pairs were prepared, along with 40 filler sentences. A sample set of SRC target sentence pairs is shown in (2).

- (2a) **No gap condition**
- | | | | | |
|-----------------|-------------|---------------------|----------------|----------------|
| Na'e fakakaukau | 'a e tōketā | [na'e tuli | 'e he loea | 'i he matātahí |
| PAST think | ABS doctor | PAST chase | ERG lawyer | on.the.beach |
| 'a e pailate] | koe'uhi | na'e lolotonga kikī | hono kaume'á. | |
| ABS-pilot | because | was screaming | his girlfriend | |
- “The doctor thought that [the lawyer chased the pilot on the beach] because . . .”
- (2b) **SRC condition**
- | | | | | | |
|-----------------|--------------|---------------------|----------------|-------|----------------|
| Na'e faitaa'i | 'e he tōketā | 'a e loea | [na'a ne | tuli | 'i he matātahí |
| PAST photograph | ERG doctor | ABS-lawyer | PAST-AGR | chase | on the beach |
| 'a e pailate] | koe'uhi | na'e lolotonga kikī | hono kaume'á. | | |
| ABS-pilot | because | was screaming | his girlfriend | | |

“The doctor photographed the lawyer [who _ chased the pilot on the beach] because . . .” The critical region 8 (underlined) contains an ABS NP in both conditions. If native speakers of Tongan have the ORC preference, they would posit a gap in the ABS object position upon seeing the tense and verb that mark the beginning of the relative clause. In (2b, SRC condition), the ORC preference leads the reader to predict an object gap corresponding to *e loea* ‘the lawyer’ and consequently that the clitic *ne* is a 3rd person singular subject pronoun rather than an RP. The appearance of the ABS NP ‘the pilot’ in (2b) will then reject such an ORC analysis and cause a filled-gap effect (Stowe, 1986), compared to the same ABS NP in (2a). In (2a, No gap condition), there is no need to posit a gap in the ABS object position; the existence of the ABS NP should cause no trouble.

A self-paced reading study was conducted using the software *Linger* (written by Douglas Rohde), with which the reading time for each phrase was measured. All of the stimulus sentences were followed by a yes-no comprehension question.

Analysis. One participant was excluded whose accuracy rate was exceedingly low; similarly, responses were excluded that were beyond 4,000ms and below 100ms. The mean accuracy rate for the comprehension questions for the SRC target sentence pairs was 69%. The rest of the data was modeled using LME, with random intercepts for participants and items.

Results. The mean reading time at Region 8 (critical region) showed that there was a slowdown in the SRC condition (2b), compared to its control No gap condition (2a) ($\beta = 162.55$, $t = 3.63$, $p < 0.01$). On the other hand, no region showed a significant difference in the ORC target sentence pairs.

Discussion. The reading time pattern suggested that there was a filled-gap effect in the SRC condition. Upon seeing the verb, the parser wrongly posited a gap in the ABS object position, assuming that it is reading an ORC, but the structure turned out to be an SRC.

This ORC preference suggests that there is an ABS advantage in Tongan, like Avar and Basque. Unmarkedness of the ABS in ergative languages influences on the processing cost of the relative clauses, although the ORC structure actually creates a longer filler-gap dependency (both structurally and linearly). This suggests that the structural distance in RCs (Hawkins, 2004; O’Grady, 1997) or the linear distance (Gibson, 2000) does not play a major role in Tongan relative clause processing.

Subject advantage was not observed, unlike Avar and Chamorro. The subject advantage in Avar, an ergative language (Polinsky, et al. 2012), suggests that ergative-absolutive case system is in principle compatible with the subject advantage. We suggest that the syntactic ergativity is one key factor that suppresses the subject advantage in Tongan.

In sum, Tongan exhibits an ORC preference unlike many other languages examined in the literature (English, Japanese, etc.). We argue that syntactic ergativity contributes to such a preference, further suggesting that the subject advantage in RC is not universal, but the grammar of a language like syntactic ergativity may have a strong influence for the bias.

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