

The Ergative Subject Preference in the Acquisition of *Wh*-questions in Tongan

Koichi Otaki, Manami Sato, Hajime Ono, Koji Sugisaki, Noriaki Yusa, Soana Kaitapu, ‘Ana Heti Veikune, Peseti Vea, Yuko Otsuka, and Masatoshi Koizumi

1. Subject advantage

One well-known fact about the acquisition of *wh*-questions/relative clauses (RCs) is that children perform better on subject *wh*-questions/RCs than object *wh*-questions/RCs in many languages (e.g., Tyack & Ingram, 1977 [English]; van der Meer et al., 2001 [Dutch]; Roesch & Chondrogianni, 2014 [German], among many others; see also Roeper & de Villiers, 2011, for a review). In this study, we take up two hypotheses concerning the *subject advantage* observed in the acquisition of *wh*-questions and test the predictions of the two hypotheses by investigating the acquisition of *wh*-questions in Tongan.¹

* Koichi Otaki (corresponding author), Kanazawa Gakuin University, koichi.otaki@gmail.com; Manami Sato, Okinawa International University; Hajime Ono, Tsuda University; Koji Sugisaki, Kwansai Gakuin University; Noriaki Yusa, Miyagi Gakuin Women’s University; Soana Kaitapu, Tonga Ministry of Education and Training; ‘Ana Heti Veikune, University of South Pacific, Tonga; Peseti Vea, University of South Pacific, Tonga; Yuko Otsuka, Sophia University; Masatoshi Koizumi, Tohoku University. We are grateful to the participants of our experiment as well as the teachers of Mata’aho Kindergarten and the staff members of the University of South Pacific, Tonga Campus. We are also indebted to Dr. Raelyn Esau of the Tonga Ministry of Education and Training, without whose assistance we could not have conducted this research. We would also like to thank the audience at Crosslinguistic Perspectives on Processing and Learning (Zürich, Switzerland) and BUCLD 44 for invaluable comments and suggestions. All remaining errors are of course our own. Part of this work was supported by a Grant-in-Aid for Scientific Research (S) (#19H05589, PI: Masatoshi Koizumi) and for Challenging Research (Exploratory) (#19K21634, PI: Yuko Otsuka) from the Japan Society for the Promotion of Science (JSPS).

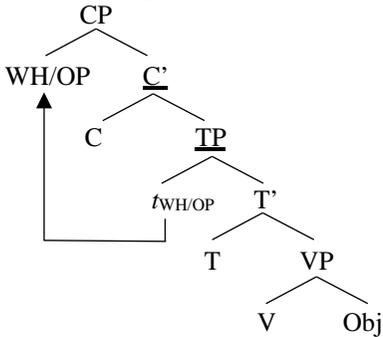
¹ There also exist other hypotheses concerning the subject advantage found in the acquisition of *wh*-questions/RCs. For example, the Relativized Minimality Account (Friedmann et al., 2009; Belletti et al., 2012) argues that a phrase that structurally intervenes between a moved *wh*-phrase/relative operator and its gap (usually a subject) serves as an intervener when it possesses identical morphological features as the *wh*-phrase/relative operator, whence it triggers an intervention effect, resulting in the poor performance on the object *wh*-questions/RCs. Since the purpose of our study is to first investigate whether the subject advantage holds in Tongan using the most basic paradigm used in previous studies (with phrases having identical morphological features) and we did

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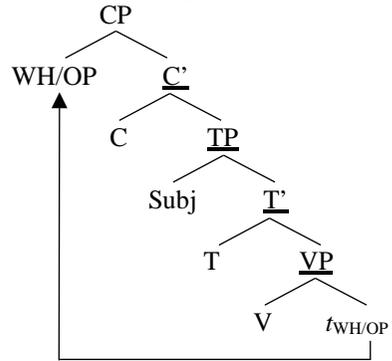
Proceedings of the 44th Boston University Conference on Language Development, ed. Megan M. Brown and Alexandra Kohut, 465-478. Somerville, MA: Cascadilla Press.

One hypothesis we address in this paper is the Structural Distance Hypothesis (O'Grady, 1997; Hawkins, 2004), which argues that structural distance between a moved *wh*-phrase/relative operator and its gap reflects processing costs: since subjects are structurally higher than objects, this hypothesis predicts that subjects are easier to process than objects. More specifically, in the structure of subject *wh*-questions/RCs in (1a), for example, there are only two nodes intervening between the moved *wh*-phrase/operator and its original position (C' and TP). In the structure of object *wh*-questions/RCs in (1b), on the other hand, there are four nodes between the moved *wh*-phrase/operator and its original position (C', TP, T' and VP).

(1) a. Subject *wh*-question/RC



b. Object *wh*-question/RC



The Structural Distance Hypothesis assumes that the number of intervening nodes reflects processing costs. Therefore, given the Difficulty Principle in (2), it explains why subject *wh*-questions/RCs are easier to comprehend/acquire than object *wh*-questions/RCs.

(2) Difficulty Principle (O'Grady, 2011)

Processing difficulty should impede use and mastery of particular form-meaning mappings.

The second hypothesis is the Accessibility Hierarchy Hypothesis (Keenan & Comrie, 1977; 1979), which argues that the extraction of subjects is more widely available than extraction of other types of NPs because subjects are syntactically more prominent than other types of NPs, as illustrated in the hierarchy in (3).

not want to make the experimental design unnecessarily complex, we did not include in our experiment test sentences that touch on the Relativized Minimality Account.

Another candidate that explains the subject advantage in the acquisition of *wh*-questions/RCs is the Frequency Account, which argues that the more frequent a particular construction is in the input, the easier it is acquired (produced/comprehended) (see Ambridge et al., 2015, for a review). Unfortunately, since no corpus data (written or spoken) are available in Tongan at the moment, we put this account aside in this paper.

- (3) Accessibility Hierarchy (Keenan & Comrie, 1977; 1979)
 Subject >> Direct Object >> Indirect Object >> Oblique >> Genitive
 ('A >> B' means A is syntactically more prominent than B.)

This hierarchy means that if a language allows extraction of NPs of a particular type, say oblique for instance, then NPs that are higher in the hierarchy (i.e., subject, direct object, and indirect object) are also allowed to undergo extraction. Assuming that the Accessibility Hierarchy has a direct bearing on sentence processing (Hawkins, 1999), the subject advantage in the acquisition of *wh*-questions/RCS is a natural consequence.

However, this typological implication does not hold for languages with ergative/absolutive case alignment (Keenan & Comrie, 1977, 1979; Aldridge, 2008). To be more specific, in many ergative/absolutive languages, intransitive subjects and transitive objects (i.e., absolutive arguments) *wh*-move/relativize with a gap, while transitive subjects (i.e., ergative) do not. In other words, intransitive subjects and transitive objects form a natural class in terms of extraction and case, contrary to the Accessibility Hierarchy in (3).

Incorporating the facts from ergative/absolutive languages, Otsuka (2006), building on Marantz's (1991) and Chomsky's (1993) insight, proposes that Accessibility Hierarchy should be stated in terms of Case rather than grammatical relations, as illustrated in the Case Accessibility Hierarchy in (4).

- (4) Case Accessibility Hierarchy (Otsuka, 2006)
 Unmarked Case (NOM/ABS) >> Marked Case (ACC/ERG) >> Oblique

This hierarchy states that extraction of NPs with unmarked Case (nominative and absolutive) is more widely available than extraction of NPs with marked Case (accusative and ergative), because NPs with unmarked Case are syntactically more prominent than NPs with marked Case.

Most of the previous studies on the acquisition of *wh*-questions/RCS have targeted languages with a nominative/accusative Case system, for which the two hypotheses above make the same prediction, namely, the subject/nominative advantage, and research on the acquisition of *wh*-questions/RCS in ergative/absolutive languages is quite limited (but see Gutierrez-Mangado, 2011; Muāgututi'a, 2017, for notable exceptions). In this paper, we report findings from our experimental study of the acquisition of *wh*-questions in Tongan, a language with an ergative/absolutive Case system. The results from our experiment suggest that Tongan-speaking children show an ergative subject preference, supporting the prediction of the Structural Distance Hypothesis.

This paper is organized as follows. In the next section, we briefly review some basic properties of Tongan that are relevant for this study. Section 3 reports the experiment we conducted with Tongan-speaking children, and finally Section 4 concludes the paper.

2. Some basic properties of Tongan

Tongan is an Austronesian language of the Polynesian branch spoken by approximately 110,000 people living in the Kingdom of Tonga in the South Pacific (Blust, 2013). This section summarizes some grammatical/morphological properties of the Tongan language that are relevant to this paper (see Churchward, 1953; Otsuka, 2000, for broader aspects of Tongan grammar).

First, the basic word order of Tongan is VSO, as shown in (5).

- (5) Na'e 'ofa'i ['e Sione] ['a e fefine].
 Past love Erg John Abs Def² woman
 'John loved the woman.'

In (5) the verb 'ofa'i (love) comes first with the past tense marker *na'e*. Then, the subject *Sione* (John) with the ergative marker 'e follows the verb, and at the end, the object *fefine* (woman) comes with the absolutive marker 'a and the definite particle *e*. VSO is considered to be the syntactically most basic word order in Tongan, although other word orders such as VOS, SVO, and OVS are also allowed (Otsuka, 2000; Custis, 2004).

Second, Tongan exhibits ergative-absolutive case alignment. For example, the intransitive subject *fefine* (woman) in (6) bears the absolutive marker 'a, which is identical to the one used for the transitive object in (5).

- (6) Na'e 'alu ['a e fefine] ki Tonga.
 Past go Abs Def woman to Tonga
 'The woman went to Tonga.'

Third, argument *wh*-phrases can either remain in-situ or be placed in sentence-initial position, as shown in (7) and (8), respectively.

- (7) In-situ absolutive object *wh*-question
 'Oku tuli 'e he sipi 'a e manu fē?
 Pres chase Erg Def sheep Abs Def animal which
 Lit. 'The sheep is chasing which animal?'

- (8) Absolutive object question with a *wh*-phrase in sentence-initial position
 Ko e manu fē 'oku tuli 'e he sipi Δ ?
 Pred Def animal which Pres chase Erg Def sheep
 'Which animal is the sheep chasing?'

² Strictly speaking, the article *e* (allomorph *he*) indicates specificity and not definiteness. The latter is expressed in Tongan phonologically as *definitive accent*, stress on the final vowel of the final word of the relevant noun phrase, orthographically indicated as an acute accent, as in *fefiné* vs. *fefine*. In this paper, however, we gloss *e/he* as definite and dispense with orthographic representation of definitive accent in Tongan examples for the sake of simple exposition.

The example in (7) is a *wh*-in-situ question where the absolutive object *wh*-phrase ‘*a e manu fē* (which animal) stays in the original position. When occurring in sentence-initial position, as in (8), the *wh*-phrase is accompanied by *ko*, a particle marking predicate nominals. *Wh*-questions like (8) involve a pseudo-cleft construction, whose structure is illustrated in (9), where the *wh*-phrase is the predicate and the remaining part of the sentence serves as the subject, headless relative clause.

- (9) Ko [e manu fē] [CP OP_i [C' ‘oku tuli ‘e he sipi Δ_i] ?
 Pred Def animal which Pres chase Erg Def sheep

Nonetheless, *wh*-questions like (8) differ from *wh*-in-situ questions in that the former involves A-bar extraction (though not of the *wh*-phrase *per se*, but of a null operator). In what follows, Δ indicates the position of the gap resulting from the operator movement, where the *wh*-phrase is interpreted.

Lastly, let us see an example of an ergative subject question with a *wh*-phrase in sentence-initial position.

- (10) Ergative subject question with a *wh*-phrase in sentence-initial position
 Ko e manu fē ‘oku **ne** tuli Δ ‘a e sipi?
 Pred Def animal which Pres RP chase Abs Def sheep
 ‘Which animal is chasing the sheep?’

As with the object *wh*-question in (8), the *wh*-phrase *e manu fē* (which animal) in (10) appears in sentence-initial position. One crucial difference between (8) and (10) is the presence of the resumptive pronoun (RP) *ne* (3sg) in (10), which is obligatory in ergative subject *wh*-questions in Tongan.³ This means that ergativity is not confined to morphological marking but also manifests in syntactic domains. Tongan is therefore said to show *syntactic ergativity*.

Interestingly, the Structural Distance Hypothesis and the Case Accessibility Hierarchy Hypothesis discussed in Section 1 make different predictions for the acquisition of *wh*-questions in Tongan. Given the standard analysis, where subjects are structurally higher than objects, the Structural Distance Hypothesis predicts that the subject advantage will also be observed in the acquisition of *wh*-questions in Tongan. The Case Accessibility Hierarchy Hypothesis, on the other hand, predicts that ergative subject *wh*-questions will be more difficult to comprehend than absolutive object *wh*-questions, because ergative Case, being lower in the Case Accessibility Hierarchy in (4), is less prominent than absolutive

³ This pronoun *ne* (3sg) is also used as a subject clitic pronoun, as shown in (i), and changes its form according to person and number (e.g., *nau* (3pl), *ke* (2sg)).

- (i) Ko hai ‘oku **ne** teke Δ ?
 Pred who Pres 3sg push
 ‘Who is (s)he pushing?’

Case. In the rest of this paper, we report our experimental findings of the acquisition of Tongan *wh*-questions, which we believe constitute a good testing ground for these competing hypotheses.

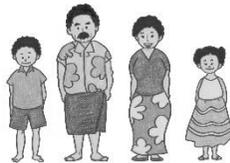
3. Experiment

3.1. Participants

Participants were 27 Tongan-speaking children aged 4 to 5 (mean age, 4;10). Sixty Tongan-speaking adults also participated as controls. Children were recruited from a kindergarten in Nuku'alofa, Tonga. Adult participants were students and staff members recruited from the University of South Pacific, Tonga Campus.

3.2. Procedure and materials

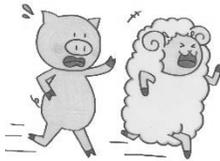
Before the main experiment, we had a practice session in which an experimenter, a native speaker of Tongan, asked participants some simple questions using the pictures below.



Ko fē 'a e ta 'ahine?
'Where is the girl?'



Ko fē 'a e pusi?
'Where is the cat?'



Ko e hā e me 'a 'oku fai 'e he puaka?
'What is the pig doing?'



Ko e hā e me 'a 'oku fai 'e he tamasi 'i?
'What is the boy doing?'

Figure 1: Sample pictures and questions used in the practice session

When they hesitated in answering or gave a wrong response, the experimenter gave the correct answer. This ensured that participants knew the words referring to the characters and actions used in the experiment.

In the main session, the experimenter orally asked participants the four types of *wh*-questions listed in (11).

(11) Sample test sentences

a. Absolutive subject questions

Ko e manu fē 'oku hiva Δ mo e pusi?
 Pred Def animal which Pres sing with Def cat
 'Which animal is singing with the cat?'

b. Ergative subject questions

Ko e manu fē 'oku ne tuli Δ 'a e sipi?
 Pred Def animal which Pres RP chase Abs Def cat
 'Which animal is chasing the cat?'

c. Absolutive object questions

Ko hai 'oku teke 'e he fa'ē Δ ?
 Pred who Pres push Erg Def mother
 'Who is the mother pushing?'

d. In-situ absolutive object questions

'Oku teke 'e he ta'ahine 'a hai?
 Pres push Erg Def girl Abs who
 Lit. 'The girl is pushing who?'

(11a) is an intransitive sentence with an absolutive subject *wh*-phrase. (11b) is an ergative subject *wh*-question, which obligatorily requires that a resumptive pronoun be placed between the tense marker and the verb. (11c) is an absolutive object *wh*-question, and (11d) is an in-situ absolutive object *wh*-question, where a *wh*-phrase stays in the original object position. Each sentence type had three tokens (one with human characters and *hai* (who), and the others with animal characters and *manu fē* (which animal)), yielding twelve test sentences in total. The order of the test sentences was semi-randomized so that participants did not hear the same types of sentences consecutively.

Test sentences were given to participants with pictures shown on a computer display. In the pictures with transitive questions such as (11b), (11c), and (11d), one character acts on another character, who acts on yet another character in a transitive manner, as illustrated in Figure 2 below (cf. Longenbough & Polinsky, 2016).



Figure 2. Sample picture and test sentence in the transitive conditions

The correct answer for the ergative subject *wh*-question in Figure 2 is ‘rabbit,’ but there also is a good chance that children would choose ‘dog’ as an answer if they misunderstand it for an absolutive object *wh*-question.

In the pictures with intransitive questions such as (11a), two characters carry out the same intransitive action (e.g., singing), while the other character carries out a different intransitive action (e.g., listening), as shown in Figure 3.



Ko e manu fē 'oku hiva mo e pusi?
‘Which animal is singing with the cat?’

Figure 3. Sample picture and test sentence in the intransitive condition

If participants correctly understand the absolutive subject *wh*-question above, they are expected to choose ‘dog’ as their answer.

Test trials were split into two lists, half presented in an inverted order and with mirror image pictures to avoid potential order and directionality effects.

3.3. Predictions

The predictions that the two hypotheses discussed in Section 1 (the Structural Distance Hypothesis and the Case Accessibility Hierarchy Hypothesis) make are summarized in Table 1.

Table 1. Predictions for each sentence type

	Structural Distance	Case Accessibility Hierarchy
(11a) Absolutive Subj.	Easy	Easy
(11b) Ergative Subj.	Easy	Difficult
(11c) Absolutive Obj.	Difficult	Easy
(11d) In-situ Abs. Obj.	Easy	Easy

The two hypotheses predict that children will have no difficulty comprehending absolutive subject *wh*-questions in intransitive sentences (11a), as no competing arguments exist within a sentence. This condition serves as a baseline for comparison with other experimental conditions. Importantly, the two hypotheses make different predictions for (11b) and (11c). The Structural Distance Hypothesis predicts that children will have difficulty comprehending absolutive

object *wh*-questions (11c), because objects are lower in the structure than subjects, hence imposing greater processing loads. The Case Accessibility Hierarchy Hypothesis, on the other hand, predicts that ergative subject *wh*-questions (11b) will be difficult for Tongan-speaking children to comprehend, because ergative Case is lower in the Case Accessibility Hierarchy in (4) than absolutive Case. Lastly, since no movement is involved in in-situ absolutive object *wh*-questions (11d), the two hypotheses predict no difficulty in this condition.⁴ This condition is necessary to see whether any difficulties found in the experiment result either from the dependency between the *wh*-phrase and the gap or from children's general cognitive bias (e.g., agent is easier to process/comprehend than patient/theme).

3.4. Results

The summary of the results is given in Figure 4 below. First, adult controls behaved as expected, with over 90% correct responses across conditions. Though a One-way Repeated-measures ANOVA with four levels on the independent variable revealed a significant main effect of sentence type ($F(3,177)=2.81$, $p<.05$), post-hoc pairwise comparisons (Tukey's HSD test) showed no statistically significant difference between conditions. A One-way Repeated-measures ANOVA was also conducted for the children, revealing a significant main effect of sentence type ($F(3,78)=7.31$, $p<.001$). Post-hoc pairwise comparisons (Tukey's HSD test) showed that there was no statistical difference between ergative subject questions (11b) and absolutive subject questions (11a), while absolutive object questions (11c) were significantly more difficult than absolutive subject questions (11a).

⁴ One note is in order here. The Structural Distance Hypothesis predicts no difficulty in (11d), as discussed in the text, only under the assumption that only overt movement that creates a non-canonical word order has consequences for processing filler-gap dependencies, whereas covert movement at LF does not impose such processing loads. On the other hand, if the overt/covert distinction is not relevant for processing and dependencies created by covert movement also give rise to processing difficulties, the Structural Distance Hypothesis predicts that absolutive object *wh*-questions will be difficult to comprehend in (11d).

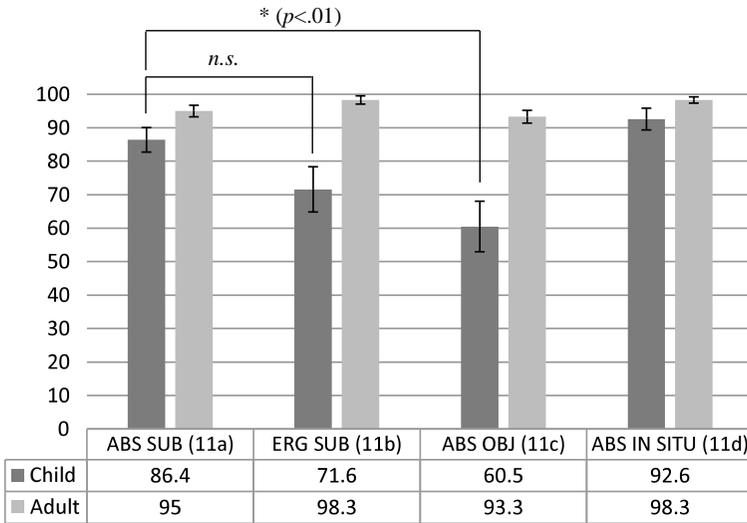


Figure 4. Summary of the results (% correct responses)

In addition, a significant difference between in-situ absolutive object questions (11d) and ergative subject questions (11b), and also between in-situ absolutive object questions (11d) and absolutive object questions (11c), was observed ($p < .05$ and $p < .01$, respectively). Other comparisons did not reach statistical significance.

3.5. Discussion

The most important finding of the current experiment was that the subject advantage was observed even in the acquisition of *wh*-questions in Tongan, which exhibits ergative-absolutive case alignment. This supports the Structural Distance Hypothesis – it is more difficult for Tongan-speaking children to comprehend object *wh*-questions than subject *wh*-questions because objects are lower in the structure than subjects.

Note that children's difficulty with object *wh*-questions is not due to a general cognitive difficulty comprehending objects/patients. In fact, Tongan-speaking children did very well with in-situ absolutive object *wh*-questions (11d). This indicates that Tongan-speaking children had no difficulty comprehending object

wh-questions *per se*, and children's difficulties in the experiment stem from the dependency between a *wh*-phrase and a gap.^{5,6}

The Case Accessibility Hierarchy Hypothesis is not a good candidate to explain children's comprehension of *wh*-questions in Tongan. This does not mean that the Case Accessibility Hierarchy itself should be rejected. In fact, Ono et al. (in press) report that adult Tongan-speakers show an absolutive object advantage when processing relative clauses, in conformity with the Case Accessibility Hierarchy. What the results of this experimental study suggest is that children are somehow more sensitive to structural distance than markedness of Case when comprehending/processing *wh*-questions.

Why do children adhere to structural distance? One possible reason is that acquisition of ergativity itself is difficult and thus children lack the prerequisite knowledge to access the Case Accessibility Hierarchy. Muāgututi'a (2017), for example, investigated the acquisition of ergativity in Samoan, which is another Austronesian language with ergative/absolutive case alignment, and reported that ergativity in Samoan is acquired late. More specifically, he elicited transitive sentences from Samoan-speaking children aged 5 to 7 and found that they produced an ergative case marker only 32% of the time, while adult Samoan speakers produced one 93% of the time. Based on these findings, Muāgututi'a (2017) argues that ergativity is acquired late, possibly around 7 years of age. If the same ergative difficulty is no less true in the acquisition of Tongan, we expect that children are not able to take advantage of the Case Accessibility Hierarchy, and as a result, structural distance stands out in the comprehension of *wh*-questions.

Finally, we would like to discuss yet another possibility that could explain the subject advantage observed in our experiment. Longenbaugh and Polinsky (2016) report that in the relative clause construction in Niuean, another Austronesian language showing ergative/absolutive case alignment (but without the resumptive pronoun strategy in ergative *wh*-questions), processing ergative subject gaps as in (12a) is more costly than processing absolutive subject gaps as in (12b) for adult speakers.

⁵ More specifically, as noted in Section 2, Tongan *wh*-questions (with a *wh*-phrase in sentence-initial position) involve a pseudo-cleft construction. Therefore, the effect of A-bar extraction comes from movement of an operator, not from movement of a *wh*-phrase *per se*. Tongan *wh*-questions are different from an ordinary *wh*-movement construction in that there are two kinds of dependency involved: (i) OP and its base position, and (ii) OP and the predicate *wh*-phrase. Thus, the observed difficulty in the comprehension of absolutive object *wh*-questions is considered to reflect the difficulty in processing the dependency between the *wh*-phrase and the gap via operator movement.

⁶ There remains a possibility that Tongan-speaking children construed the first argument in a sentence as an agent (the Agent-first Strategy: Suzuki, 2011; Tanaka et al., 2015). The use of in-situ object *wh*-questions with a VOS (scrambled) word order may help to determine whether children take this kind of strategy.

- (12) a. e kuli [ne epoepo Δ e puti]
 Det dog NFT lick Abs cat
 ‘the dog that is licking the cat’
- b. e puti [ne epoepo he kuri Δ]
 Det cat NFT lick Erg dog
 ‘the cat that the dog is licking’

They argue that in the absolutive object gap sentence, the presence of an ergative argument in a relative clause provides a cue to the parser that the clause is transitive and an absolutive argument should be projected, while in the ergative subject gap sentence, the presence of an absolutive argument cannot be a strong predictor (as the sentence could be transitive or intransitive).

This *case-cueing* effect makes an interesting prediction for the processing of *wh*-questions in Tongan. As repeated in (13) below, ergative subject *wh*-questions in Tongan require a resumptive pronoun such as *ne* (3sg) before a verb.

- (13) Ko e manu fē ‘oku **ne** tuli Δ ‘a e sipi?
 Pred Def animal which Pres RP chase Abs Def cat
 ‘Which animal is chasing the cat’

This property leads us to suspect that the resumptive pronoun serves as a strong predictor indicating that the sentence is an ergative subject question, and the processing advantage triggered by the resumptive pronoun resulted in the ergative subject advantage observed in our experiment. To test this possibility experimentally, it will be necessary to examine the time course of children’s sentence processing using online techniques such as self-paced listening and eye tracking, which we leave for future research.⁷

⁷ In fact, we also collected eye movement data from the Tongan-speaking children who participated in our study, and no case-cueing effect was found at the point when they processed resumptive pronouns (Otaki et al., 2019). We suspect that the absence of a case-cueing effect was due to a temporal ambiguity involved in the test sentences. More specifically, as noted in footnote 3, the resumptive pronoun *ne* (3sg) in (13) can also be used as a subject clitic pronoun, as repeated in (i).

- (i) Ko hai ‘oku **ne** teke Δ ?
 Pred who Pres 3sg push
 ‘Who is (s)he pushing?’

At the point when a hearer encounters *ne* in (i), there remain two possible structures – one is an object *wh*-question with *ne* serving as a subject clitic pronoun, just as in (i), and the other is an ergative subject *wh*-question with *ne* serving as a resumptive pronoun (this possibility is eventually cancelled in (i) due to the absence of an absolutive argument after the verb). This temporal ambiguity might have obscured the case-cueing effect of resumptive pronouns in our eye-tracking study. Further research is needed to fully understand the effects of case-cueing in the processing of ergative *wh*-questions in Tongan.

4. Conclusion

In this paper, we investigated the acquisition of *wh*-questions in Tongan. The results of our experiment show that it is easier for Tongan-speaking children to comprehend ergative subject *wh*-questions than absolutive object *wh*-questions. This indicates that the subject advantage is observed even in the acquisition of ergative/absolutive languages, suggesting that children are more sensitive to structural distance than the markedness of Case when comprehending/processing *wh*-questions. There still remain other possible factors related to the observed subject advantage: for example, the frequency of subject/object *wh*-questions, the intervention effect, and the Agent-first Strategy. Further research is needed to narrow down the exact factors responsible for the subject advantage observed in the acquisition of Tongan *wh*-questions.

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