Pronoun resolution and ergativity: Effects of subjecthood and case in Niuean

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Abstract: Anaphoric pronouns such as 'it' are referentially underspecified and therefore depend on prior context for interpretation. The factors influencing their interpretation are a long-standing topic of research in syntactic and pragmatic literature. We present a novel study of pronoun resolution in the ergative-absolutive Polynesian language Niuean, investigating whether Niuean exhibits the same subject preference found for nominative-accusative languages (e.g. Chafe 1976) or whether, alternatively, the absolutive argument is preferred as a referent. Niuean also exhibits split ergativity, allowing for isolation of further effects of case (wherein listeners show a preference for antecedents which bear the same case as the pronoun), and transitivity (wherein direct objects are preferred as antecedents as compared with adjuncts). Most importantly, we observe that ergative arguments are consistently preferred as referents over clause-mate absolutive arguments, providing evidence that ergative arguments exhibit parallel behaviour to "subjects" in nominative languages.[*]

Keywords: Pronouns, subjecthood, case, transitivity, ergativity.

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1. INTRODUCTION. A key aspect of language interpretation involves mapping a referring expression onto a referent, usually an entity or an event. Referring expressions vary greatly in complexity, ranging from highly descriptive (e.g. *the black dog that chased the rabbit*), to less descriptive (e.g. *the dog*), to pronominal elements (e.g. *it*). Pronominal elements encode minimal semantic information about the referent – most commonly just number, gender and animacy, and are therefore often compatible with several referents in the context.

Pronominal elements have received much attention in the literature. Like with other linguistic phenomena, much of the research concerns English. However, pronominal elements have been investigated in many other languages, including both other Indo-European languages such as German (e.g. Bosch & Umbach 2007, Kaiser 2011b), Dutch (e.g. Comrie 2000, Kaiser 2011a), Italian (e.g. Fedele and Kaiser 2014), and Brazilian Portuguese (e.g. Almor, de Carvalho Maia, Cunha Lima, Vernice amd Gelormini-Lezama 2017), but also languages from other families, such as Hebrew (Semitic: e.g. Ariel 1990), Finnish (Finno-Ugric: e.g. Kaiser and Trueswell 2008), and Japanese (Japonic: e.g. Ueno and Kehler 2010). Although these languages differ in the types and distribution of their pronominal elements, they are similar in their case alignment, all being nominative-accusative languages.

Nominative-accusative languages – roughly 75% of the world's language (Dixon 1994) – are such that arguments bear case marking that is determined by their grammatical role: a subject bears nominative case, independent of whether it is the subject of a transitive verb (referred to in the syntactic literature as 'A') or the subject of an intransitive verb ('S'), and an object ('P') bears accusative case. In ergative-absolutive languages, in contrast, case marking is not determined by grammatical role but rather is also dependent on the type of verb: the subject of a TRANSITIVE verb (A) bears ergative case, whereas the subject of an INTRANSITIVE verb (S) bears absolutive case, as does the object of a transitive verb (P). Thus, in ergative-absolutive languages, verb transitivity plays a key role in determining the case assigned to arguments. These two types of case alignment are illustrated in Figure 1.

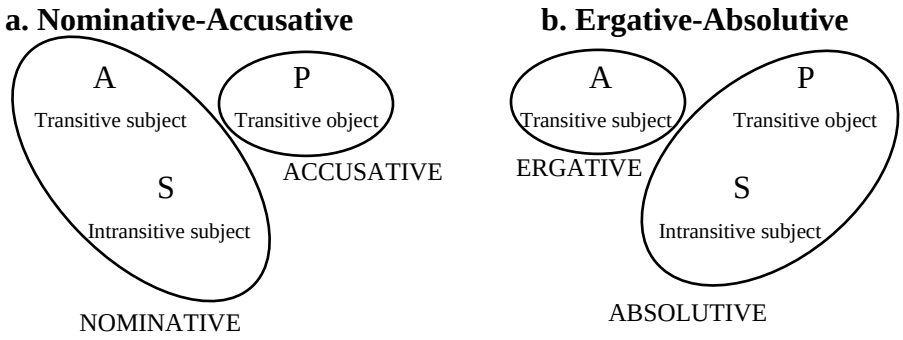

FIGURE 1. Nominative-accusative and ergative-absolutive case alignments

The current paper presents the first study of pronoun resolution in an ergative language. We investigate Niuean, a Polynesian language spoken in the south Pacific. Studying pronoun resolution in an ergative language is particularly interesting because the notion of a grammatical subject has been shown to play a central role in the choice of antecedents cross-linguistically, whereby (nominative) subjects are generally preferred as antecedents for pronouns compared with (accusative) objects. Because the identity of the grammatical subject in ergative-absolutive languages is controversial – and this is especially true in ergative Austronesian languages – , examining pronoun resolution in such a language has the potential to create a more complete picture of the factors that play a role in pronoun resolution, and, in addition, to contribute to our understanding of subjecthood, both within Niuean, and cross-linguistically.

In the remainder of this section, we introduce factors that have been shown to affect pronoun interpretation cross linguistically, and discuss how they are expected to play out in Niuean. In section 1.1, we discuss the importance of subjecthood to pronoun resolution, and in section 1.2 we turn to subjecthood in Niuean. In section 1.3, we discuss a different factor that affects pronouns – parallelism, and also introduce Niuean pronouns.

1.1. SUBJECTHOOD IN PRONOUN RESOLUTION. Because pronouns encode minimal linguistic information – most commonly, number, gender and animacy, they are compatible with a range of potential referents. For example, the pronoun *she* in 1 can refer to any referent that is animate, feminine, and singular. Indeed, the preceding sentence provides two such options: the entities

denoted by *Deborah* and *Rita*, and so the pronoun is referentially ambiguous between those two interpretations.

(1) Deborah called Rita and she asked a lot of questions. (adapted from Arnold 2010: 187)

While both interpretations are grammatically available, it has long been known that some antecedents are preferred to others. For example, the choice of antecedent for a pronoun has been widely argued to be governed by pragmatic prominence or ACCESSIBILITY, wherein certain entities are more salient in the discourse than others (Ariel 1990, Gundel, Hedberg & Zacharski 1993). Arnold 2010:188 refers to accessibility as "the property of information that makes it easier to access, independent of ambiguity considerations." The more accessible an entity, the more likely (i) it is to be referred to using a pronoun in subsequent discourse, and (ii) it is to be interpreted by a listener as the referent for a (referentially ambiguous) pronoun. Accessibility has been argued to depend on aspects of the discourse such as GIVENNESS, whereby entities that have already been mentioned ("discourse old") are more likely to be referred to using pronouns than entities that have not been mentioned ("discourse new"). Accessibility has also been shown to depend on RECENCY, whereby entities that have been mentioned more recently are more likely to be referred to with a pronoun than referents mentioned earlier – see Kaiser 2009 and Arnold 2010 for further discussion.

Most importantly for our present purposes, accessibility has also been shown to be influenced by the grammatical role of the antecedent, with subject antecedents being more accessible than object antecedents. For example, when an entity is mentioned as a subject, it is more likely than any other argument to become the referent of a pronoun in the following sentence (Chafe 1976, Crawley & Stevenson 1990). This privilege of the grammatical subject has been established in a series of self-paced reading studies by Gordon, Grosz, and Gillom 1993; see also Ariel 1990; Gundel, Hedberg and Zacharski 1993. Gordon et al. found that sentences in which the subject from previous discourse is NOT realized as a pronoun are read slower compared with sentences in which the previous subject IS realized as a pronoun (this did not depend on whether the subject was mentioned first or not). This effect, termed the "repeated-name penalty", was found for subjects, but – importantly – not for non-subjects (i.e. objects and adjuncts). Gordon et al. conclude that the grammatical subject provides an important functional link to the previous sentence.

Gordon et al.'s findings support Centering Theory (Grosz, Joshi, & Weinstein 1995), which posits that entities in a sentence are ranked according to their grammatical role, as in 2. In this hierarchy, the subject outranks the objects, and is therefore more likely to be realized as a pronoun than the object. We will refer to this notion as SUBJECT PROMINENCE.

(2) Ranking according to grammatical function (Grosz et al. 1995:15)

subject > object > other

Thus, subject prominence corresponds to a bias for pronouns to be interpreted as referring to previous subjects. While earlier theories assumed that pronouns prefer subjects as the antecedent of pronouns, more recent theories (e.g. Kehler & Rohde 2013) have posited that that the subject bias in pronoun interpretation is not a single effect, and instead arises from combining (i) the bias to PRODUCE a pronoun when referring to subjects, and (ii) expectations about what referent would be mentioned next. These expectations may arise from the general need to create a semantically coherent discourse (e.g. Hobbs 1979; Kehler et al. 2008), or from a grammatical bias to mention the previous subjects (e.g. Arnold 2013; see also Arnold 1998, 2001). What is important for our purposes here is that the notion of a grammatical subject is central to pronoun interpretation across different theories. Pronoun interpretation (and production) has only been studied in nominative-accusative languages, where the identity of the grammatical subject is straightforward. The goal of the current paper is to examine pronoun interpretation in the ergative language Niuean, where – like in Austronesian languages more generally – the identity of the subject is debated. The next section introduces subjecthood with a focus on Niuean.

1.2. SUBJECTHOOD IN NIUEAN. Niuean is a Polynesian language spoken by approximately 6,700 people (Siosikefu & Haberkorn 2008; via Rolle & Starks 2014) who live primarily on Niue island and in New Zealand. The basic word order in Niuean is Verb-Subject-Object (VSO), and Niuean exhibits an ergative-absolutive case alignment. For example, in 3a with the transitive verb *tutuli*, the subject is marked with ergative case and the object is marked with absolutive case. In 3b, the verb *poi* is intransitive, and so the subject is marked with absolutive case; note that it is possible to add an (optional) adjunct to such sentences, in which case it bears oblique case. [1]

(3) Niuean transitive and intransitive verbs[2]

a. Transitive-ERG
Ne tutuli he kulī e lapiti.
PST chase ERG dog ABS rabbit
'The dog chased the rabbit.'

b. Intransitive-ABS
Ne poi e kulī (ke he lapiti).
PST run ABS dog (OBL rabbit)
'The dog ran (to the rabbit).'

Niuean is also a split ergative language (Silverstein 1976), in that it has an additional set of 'middle' verbs that have traditionally been regarded as SEMI-TRANSITIVE: they require both a subject and an object, but they do not exhibit the ergative-absolutive case alignment that is associated with prototypical transitive verbs (see Chung 1978). For example, even though the verb in 4 requires an object, the subject bears absolutive case and the object –oblique case.

(4) Niuean middle verb: Transitive-ABS

Ne fakaalofa e kulī *(ke he lapiti).
PST pity ABS dog OBL rabbit
'The dog pitied the rabbit.'

Importantly, the oblique object of middle verbs such as *fakaalofa* in 4 exhibits similar syntactic behaviour to the absolutive object of prototypical transitive verbs such as *tutuli* in 3a in two respects. First, oblique objects of middle verbs are obligatory, meaning that they cannot be omitted, just like absolutive objects of transitive verbs. Second, the two verb classes – transitives and middles – behave similarly with respect to so-called 'pseudo-noun incorporation' (Massam 2001b). In this construction, demonstrated in 5, the object immediately follows the verb (rather than following the subject), and it is interpreted as indefinite, non-individuated, and non-affected; the subject, in turn, bears absolutive case (see Seiter 1980; Massam 2001b). This construction is termed 'pseudo' noun incorporation because the object does not undergo morphological incorporation. Crucially, pseudo-noun incorporation is possible with prototypical transitive verbs, as in 5a, and middle verbs, as in 5b, but *not* with intransitive verbs, as demonstrated by the ungrammaticality of 5c.

(5) Niuean pseudo-noun incorporation

a. Transitive-ERG verb (cf. 3a)
Ne tutuli lapiti e kulī.
PST chase rabbit ABS dog
'The dog chased rabbits.'

b. Transitive-ABS (Middle) verb (cf. 4)
Ne fakaalofa lapiti e kulī.
PST pity rabbit ABS dog
'The dog pitied rabbits.'

c. Intransitive-ABS verb (cf. 3b)
*Ne poi lapiti e kulī
PST run rabbit ABS dog
Attempted: 'The dog ran to rabbits'

Because the oblique object of middle verbs behaves syntactically like an absolutive object of a prototypical transitive verb and unlike an oblique adjunct that can appear with an intransitive verb in that it is obligatory and can undergo pseudo noun incorporation, we consider middle verbs as formally transitive, meaning that their object is a direct object, which has the status of a syntactic ARGUMENT (cf. Tollan 2018, on related Polynesian language Samoan).[3]

Thus far, we have consistently referred to the first argument in the VSO order as "the subject". However, the identity of the 'subject' in many ergative languages – especially those of the Austronesian family – is highly debated. Various syntactic properties have been identified as being afforded only to the subject of a sentence (e.g. Keenan 1976, Manning 1996, Aldridge 2004, Tollan 2019 a.o.). In English, all six diagnostics apply to the nominative agent, as illustrated in 6: a subject typically (i) functions as the addressee in an imperative, as in 6a, (ii) is interpreted as the antecedent of a reflexive pronoun (i.e. 'binds' the reflexive, as in 6b, (iii) is interpreted as the inferred actor (a.k.a. 'PRO') in an embedded 'control' infinitive, as in 6c, (iv) is the argument that triggers verb agreement, as in 6d, (v) gets interpreted as the referent of an unexpressed DP in coordinate constructions (i.e. acts as the coordination "pivot"; Dixon 1979) like in 6e, and (vi) undergoes 'raising' from a the subject position of embedded clause to the subject position of a matrix raising verb like seem, as in 6f.

(6) Properties of subjects in English
a. Imperatives: subject as null addressee.
Chase the rabbit! (cf. *The dog chase!)

b. Binding of reflexives pronoun: subject binds object.
The dog$_i$ chased itself$_i$ (cf. *Itself$_i$ chased the dog$_i$)

c. Embedded infinitives: subject as controlled PRO.
The dog$_i$ wants [PRO$_i$ to chase the rabbit] (cf. *The rabbit$_i$ wants [the dog to chase PRO $_i$])

d. Agreement: verb agrees with the subject.
The dog[3SG] chase**s[3SG]** the rabbits[3PL] (cf. *The rabbits[3PL] chase**s[3SG]** the dog[3SG])

e. Coordination: subject as "pivot"
[The dog chased the rabbit] and [__ left] (= "the dog left"; "*the rabbit left").

f. Raising: a subject may "raise" to a matrix clause from an embedded clause
The dog$_i$ seems [__$_i$ to chase the rabbit] (cf. *The rabbit$_i$ seems [the dog to chase__$_i$]).

In many ergative-absolutive languages, however, the properties in 6 are divided between ergative agent arguments and absolutive patient arguments (Aldridge 2004). In Niuean, the identity of the subject is uncontroversial for the absolutive arguments in intransitive clauses (3b above) and in clauses with middle verbs (4 above). For ergative-absolutive clauses (3a above), however, the identity of the subject is debated, with three alternative stances: (i) the ergative argument is the subject, (ii) the absolutive argument is the subject, or (iii) both arguments count as subjects, with neither being exclusively THE subject. Because the grammatical role of subject is central to pronoun interpretation, we consider the motivation for each approach, as well as their predictions for pronoun resolution.

The motivation for arguing that the ergative argument is the subject (Seiter 1980) comes from several of the standard diagnostics of subjecthood outlined in 6. In particular, the ergative argument appears in four of the six syntactic configurations that characterize other subjects: it functions as the addressee of a transitive imperative as in 7, it is interpreted as the antecedent of a reflexive pronoun (a.k.a. it binds the reflexive) as in 8, it is interpreted as the inferred actor in an embedded infinitive (a.k.a. controlled PRO) as in 9, and it acts as the coordination pivot, as in 10.

(7) ERG as addressee of imperative (cf. 6a)
Kai __ e ika!
eat __ ABS fish!
'Eat the fish!'

(8) ERG as antecedent of a reflexive (cf. 6b)
Kitia he tama fifine a ia nî he fakaata.
see ERG girl ABS her REFL in mirror
'The girl sees herself in the mirror.' (Seiter 1980: 214, via Massam 2001b)

(9) ERG as the inferred actor of an infinitive (cf. 6c)
Kua lali a aui [ke ta __ e faloku].
PERF try ABS I COMP play ABS flute
'I have tried to __ play the flute.' (Massam & Smallwood 1996: 267)

(10) ERG as coordination pivot (cf. 6e)
[Ne tutuli e Sione a Mele] **mo e/ti** [kata].
PST chase ERG Sione ABS Mele **and** laugh
'Sione chased Mele and (Sione/*Mele) laughed.' (Clemens & Tollan 2021: 106-107)

If the ergative argument is the subject in transitive clauses in Niuean, this would predict that, in the interpretation of pronouns, an ergative antecedent would be preferred over an absolutive antecedent.

The second approach takes the absolutive argument to be the subject in transitive ergative-absolutive clauses. This stance, adopted by Biggs 1974 and Sperlich 1994, arises on theoretical grounds which posit that every clause must consist of a subject and a predicate (e.g. Opdycke 1965, Rothstein 1983; see discussion in Massam 2001a): because in intransitive constructions the only available candidate is the absolutive argument, then this argument should also function as the subject in transitive clauses. In terms of the diagnostics from 6, however, only one points towards the absolutive as the 'subject': Niuean verbal number agreement, although non-productive, targets absolutive arguments in ergative-absolutive transitive clauses like in 11 (it may target an ergative argument in certain circumstances; however, in these instances, the surface ergative DP can be construed as a thematically INtransitive subject, and hence, associated with absolutive case at some underlying level; Haji-Abdolhosseini, Massam & Oda 2002).

(11) Verb agreement in Niuean: targets absolutive DPs (cf. 3d)
a. Singular ABS: singular number agreement
Kua hala e ia e lâ akau.
PERF cut ERG he ABS branch tree
'He cut the branch.'

b. Plural ABS (but singular ERG): plural number agreement
Kua hahala e ia e tau lâ akau.
PERF cut.**PL** ERG he ABS PL branch tree
'He cut the branches.'
(Haji-Abdolhosseini, Massam & Oda 2002:476)

Interestingly, this position is also consistent with recent findings from the processing literature regarding the real-time processing of WH questions in Niuean. Specifically, Tollan, Massam and Heller 2019 found a processing bias for dependencies of absolutive arguments in both clauses: transitive (where the absolutive is in object position), as well as middles and intransitives (where the absolutive is in subject position). This pattern could potentially be interpreted in the context of the well-known SUBJECT ADVANTAGE in long-distance dependencies (a.k.a. filler-gap dependencies) which has been reported in numerous processing studies on nominative-accusative languages (e.g. Holmes & O'Regan 1981; see Lau & Tanaka 2021 for a review). Specifically, the processing pattern in Niuean could be interpreted as further evidence that the absolutive argument is the grammatical subject (although this position is not adopted by Tollan et al. 2019). Going back to pronouns, if the absolutive argument is the grammatical subject in all Niuean clauses, this would predict that, in the interpretation of pronouns, an absolutive antecedent would be preferred independent of clause type.

A third approach posits that neither the ergative nor the absolutive argument can EXCLUSIVELY be classified as the grammatical subject of ergative-absolutive clauses, as both arguments exhibit SOME properties that are typically associated with grammatical subjects (Massam 2001b). For example, unlike English where 'raising' is restricted to (nominative) subjects, as shown by the diagnostic in 6f, in Niuean, both the ergative argument and the absolutive argument can undergo raising (see also discussion in Massam 1985, and Longenbaugh & Polinsky 2018). Consider, the baseline sentence in 12a, where both arguments of the embedded verb *kai* ('eat') appear in the embedded clause: the ergative subject *he pusi* ('the cat') and the absolutive object *e ika* ('the fish'). Raising of the ergative argument – the thematic subject – is demonstrated in 12b, where *the cat* instead appears in the matrix clause (it is now marked with absolutive case; see Béjar & Massam 1999, for discussion of so-called 'multiple case checking'). Raising of the absolutive argument – the thematic object – is demonstrated in 12c, where the fish appears in the matrix clause (it is again marked with absolutive case).

(12) Raising in Niuean (cf. 6f)

a. No raising (baseline)
To nākai toka e au [ke kai he pusi e ika].
FUT not let ERG I [COMP eat ERG cat ABS fish]
'I won't let the cat eat the fish.'

b. Raising of ERG subject
To nākai toka e au **e** **pusi**$_i$ [ke kai ___$_i$ e ika].
FUT not let ERG I ABS cat COMP eat ABS fish
'I won't let the cat eat the fish.'

c. Raising of ABS object
To nākai toka e au **e** **ika**$_i$ [ke kai he pusi ___$_i$].
FUT not let ERG I ABS fish COMP eat ERG cat
'I won't let the cat eat the fish.'
(Lit. 'I won't let the fish the cat eat')

(Seiter 1980:196, via Massam 1985)

Parallel behaviour of ergative and absolutive arguments was also observed in an experimental study by Longenbaugh and Polinsky 2016 who examined the processing of relative clauses in Niuean: this study found no difference between reaction time to relative clauses that involves a transitive ERGATIVE dependency and one with a transitive ABSOLUTIVE dependency (both were processed slower than intransitive absolutive subject relative clauses). This outcome could potentially arise if both arguments have a similar status with respect to subjecthood. For pronouns, if the ergative and absolutive arguments of a transitive clause are both in some sense the subject, we would expect a 50-50 split between ergative and absolutive arguments in choosing a referent for a pronoun.

Two additional properties are considered relevant for subjecthood in other ergative languages, but they do not apply to Niuean. The first property is SYNTACTIC ERGATIVITY, which is most commonly manifested as an inability of ergative arguments to participate in long distance dependencies (see Deal 2016 for discussion). Syntactic ergativity is relevant for subjecthood in light of Keenan and Comrie's 1977 implicational ACCESSIBILITY HIERARCHY, which posits that a language allows for long-distance dependencies of objects only if it also allows for long-distance dependencies of subjects. Thus, if ergative arguments cannot be displaced, this may be taken as evidence that they do not function as 'subjects' (in contrast to absolutive arguments). Importantly, however, ergative argument in Niuean freely participate in long distance

dependencies such as WH questions and relative clauses (i.e. Niuean is not syntactically ergative), and thus syntactic ergativity is not relevant here.

The second property often discussed in the context of ergativity is topichood. Specifically, for Tagalog and related Philippine languages, it has been argued that the absolutive argument, being obligatorily definite and referential, functions as the topic of a sentence (e.g. Schachter 1976). Therefore, if the absolutive argument is indeed the subject, then topichood and subjecthood are necessarily conflated. In Niuean, however, absolutive arguments can be interpreted either as definite or indefinite (see e.g. Seiter 1980), and thus there is no basis to assume that they are necessarily interpreted as topics (regardless of whether they can be characterized as 'subjects').

Because the identity of the grammatical subject in transitive ergative-absolutive clauses in Niuean is unresolved, we will avoid labelling the arguments in such clauses "subject" and "object" altogether. Instead, we will rely on the fact that Niuean is standardly labelled as a VSO word order language (Seiter 1980, Dryer & Haspelmath 2021), a widely-used label in the typological literature which tacitly assumes the first argument after the verb to be the 'subject' and the second to be the 'object'. Accordingly, we will refer to the ergative argument as "the argument in subject position" and to the absolutive argument as "the argument in object position."[4] In contrast, since there is no such debate for intransitive and middle verbs, we can refer to the absolutive argument as the subject and the oblique argument as the object. Note, however, that because the VSO order is consistent across verb types, we can use "subject position" to refer to the DP argument that immediately follows the verb and "object position" to refer to the DP argument that appears later in the clause across all three verb types.

Having discussed the status of subjecthood in Niuean, which is relevant to the question of how the ANTECEDENT may affect pronoun interpretation, we are now in a position to turn to properties of the pronouns themselves. In the next section, we discuss how the position of the pronoun affects interpretation.

1.3. PARALLELISM IN PRONOUN RESOLUTION: FROM ENGLISH TO NIUEAN. Another factor that has been shown to influence pronoun interpretation is PARALLELISM, which refers to the grammatical function of the pronoun in relation to the grammatical function of potential antecedents (Sheldon 1974, Grober, Beardsley & Caramazza 1978, Smyth 1992, 1994, Chambers & Smyth 1998). The

original formulation of this phenomenon (Sheldon 1974) argued that pronouns are more likely to be interpreted with an antecedent that is in THE SAME syntactic position as the pronoun itself. For example, Chambers and Smyth 1998 observe parallelism effects in the interpretation of both subject pronouns, as in 13a, which exhibit a preference for antecedents in subject position, and object pronouns, as in 13b, which exhibit a preference for antecedents in object position (although the latter preference was weaker).

(13) a. Josh criticized Paul and then he insulted Marie. (he = Josh)

b. Josh criticized Paul and then Marie insulted him. (him = Paul)

Importantly, these effects were observed for parallel EVENTS, namely across clauses that were similar in their meaning, in which the two arguments were assigned parallel thematic roles. However, Crawley and colleagues 1990 show that parallel events alone are not sufficient to create parallel pronoun interpretation. Moreover, Smyth 1994 directly demonstrated that parallelism effects depend on surface grammatical parallelism between the two clauses (e.g. number and order of arguments, the presence of an adjunct).

We note that, in nominative-accusative languages such as English, both syntactic case and thematic roles tend to coincide with grammatical function: grammatical subjects are usually marked with nominative case and are the most agentive argument in the clause (i.e. an agent, experiencer, or stimulus), whereas grammatical objects are usually marked with accusative case and are assigned a lower ranking thematic role. It is therefore possible that the parallelism effects observed in English, could arise due to grammatical function, thematic roles or syntactic case. In ergative languages, these properties are not aligned: for example, the absolutive argument is thematically the patient in a transitive clause, and the most agentive argument in an intransitive clause. Thus, ergative languages could allow us to disentangle effects of grammatical role, thematic prominence, and case.

Before turning to the current study, we still need to introduce Niuean pronouns. Like other noun phrases, pronouns in Niuean are marked for case. The examples in 14 demonstrate the third-person pronoun *ia* which can refer to animate antecedents, either human or non-human. Note that the morphological forms of the case markers used here are different from those for common nouns above (e.g. 3-4): ergative is marked with *e*, as in 14a, absolutive is marked with

a, as in 14b-c, and oblique is marked with *ki a*, as in 14d; see Seiter 1980 and Massam 2001a for further details.

(14) Pronouns and their case markers (bolded)

a. Ergative pronoun in subject position (Seiter 1980: 10)
Ne fia taute **e ia** e motokā haaku.
PST want fix **ERG 3SG** ABS car my
'He was willing to fix my car.'

b. Absolutive pronoun in object position (Seiter 1980: 29)
To lagomatai he ekekafo **a ia**.
FUT help ERG doctor **ABS 3SG**
'The doctor will help him.'

c. Absolutive pronoun in intransitive subject position (Seiter 1980: 5)
Na fano nī **a ia** he tokotoko
PST go only **ABS 3SG** on cane
'He only walks with a cane'

d. Oblique pronoun in object position (Seiter 1980: 32)
Age e fua loku **ki a ia**.
give ABS fruit papaya **OBL 3SG**
'Give him the papaya.'

With these preliminaries in mind, we now turn to our study. Our experimental design exploits the fact that pronouns with absolutive case appear both in subject position (with intransitive verbs) and in object position (with transitive verbs), and we will use this to disentangle effects of grammatical function, thematic roles and case.

2. THE CURRENT STUDY: THE INTERPRETATION OF ABSOLUTIVE PRONOUNS IN NIUEAN. Our study examined the interpretation of absolutive pronouns, which appeared in a second clause; the first clause set up the context with two potential antecedents. The clauses were connected using the connective (*ti*) which connects two full clauses. Thus, all the arguments are overtly expressed, whether as pronouns or as complex DPs (to connect smaller syntactic units such as VPs, Niuean employs a different connector, *mo e*; see Clemens & Tollan (2021) for further discussion of coordination in Niuean).

We employed two manipulations, with a 3 (context sentence type) x 2 (position of pronoun) within-subjects design. The manipulation of context sentence type varied the case frame of the verb in the context sentence. The example in 15a illustrates a TRANSITIVE verb with an ergative-absolutive case frame (the Transitive-ERG condition). The example in 15b illustrates a 'MIDDLE' verb with an absolutive-oblique case frame (the Transitive-ABS condition); recall that the oblique object here is also an obligatory object. Finally, the example in 15c illustrates an INTRANSITIVE verb with an absolutive subject, to which we added an optional oblique object (the Intransitive-ABS condition). Of course, changing the case frame and argument structure of the verb necessarily entails changing the verb's semantics (e.g. *chase* vs. *pity* vs. *run*): our goal in constructing materials was to create discourses where there is no clear semantic bias towards one referent, to allow us to examine effects of grammatical role and case. For example, whether the dog chased, pitied, or ran after the rabbit is not expected to strongly affect the likelihood that one of them sneezed (we return to this point in discussing the results).

(15) The pronoun *ia* occur in the subject position of an intransitive verb

a. Transitive-ERG
[Ne **tutuli** he kulī e lapiti] [ti tihe a **ia**]
[PST **chase** ERG dog ABS rabbit] [and sneeze ABS **3SG**]
'The dog **chased** the rabbit, and **it** sneezed.'

b. Transitive-ABS
[Ne **fakaalofa** e kulī ke he lapiti] [ti tihe a **ia**]
[PST **pity** ABS dog OBL rabbit] [and sneeze ABS **3SG**]
'The dog **pitied** the rabbit, and **it** sneezed.'

c. Intransitive-ABS
[Ne **poi** e kulī ke he lapiti] [ti tihe a **ia**]
[PST **run** ABS dog OBL rabbit] [and sneeze ABS **3SG**]
'The dog **ran** to the rabbit, and **it** sneezed.'

To examine any effects of case, we will compare sentences with an ERG-ABS case frame 15a to sentences with an ABS-OBL case frame 15b-c; that is, we compare the Transitive-ERG conditions with the two conditions Transitive-ABS and Intransitive-ABS. This comparison is particularly important because of the long-standing debate about which argument is the grammatical subject in Transitive-ERG sentences (see again section 1.2). This design also allows us to examine the effect of transitivity: we compare Transitive-ABS (see 15b) with Intransitive-

ABS (see 15c) to ask how a transitive subject compares with an intransitive subject, and how an obligatory object (i.e. an argument) compares with an optional one (i.e. an adjunct). This second comparison addresses a further question of how the status of noun phrases as obligatory or optional affects their discourse status. These two theoretically motivated comparisons will guide our statistical analysis.

In all the examples in 15, we ask how the context sentence affects the interpretation of the subject pronoun of an intransitive verb in the second clause. We consider the predictions in reverse order. In 15c, the absolutive argument is unequivocally the grammatical subject; as such, it is expected to be more accessible than the optional object and thus should be preferred as the antecedent of the pronoun. The same applies to 15b; note, however, that the obligatory (i.e. argument) vs. optional (i.e. adjunct) status of the object in these two cases may indirectly affect the relative accessibility of the potential antecedents. In both 15b and 15c, the absolutive pronoun also bears the same case as the previous subject, which may contribute an additional boost due to parallelism. The most interesting case here is the ergative-absolutive transitive verbs in 15a: here the preferred interpretation for the pronoun may contribute to the debate about whether the grammatical subject is the ergative argument, the absolutive argument, or both (we should keep in mind that a preference for the absolutive may also be due to parallelism in case between the absolutive pronoun and absolutive antecedent).

Having considered how manipulating the context sentence may affect the interpretation of a subject pronoun, we can now consider the second manipulation which targeted the syntactic position of the pronoun itself. In addition to pronouns in subject position as in 15, in 16 we illustrate absolutive pronouns that appear in the object position of a transitive ergative-absolutive clause, namely as the patient of the transitive event. Like in the subject pronoun conditions, our goal was to choose events that would lead to a coherent story with either referent as the antecedent; for example, a lion may bite a dog or a rabbit, and this seems independent of the chasing/pitying/running event that preceded.

(16) The pronoun *ia* occurring in the object position of a transitive verb

a. Transitive-ERG
[Ne **tutuli** he kulī e lapiti], [ti gagau he leona a **ia**]
[PST **chase** ERG dog ABS rabbit] [and bite ERG lion ABS **3SG**]
‘The dog **chased** the rabbit, and the lion bit **it**.’

b. Transitive-ABS
[Ne **fakaalofa** e kulī ke he lapiti], [ti gagau he leona a **ia**]
[PST **pity** ABS dog OBL rabbit] [and bite ERG lion ABS **3SG**]
'The dog **pitied** the rabbit, and the lion bit **it**.'

c. Intransitive-ABS
[Ne **poi** e kulī ke he lapiti], [ti gagau he leona a **ia**]
[PST **run** ABS dog OBL rabbit] [and bite ERG lion ABS **3SG**]
'The dog **ran** to the rabbit, and the lion bit **it**.'

In 16a, the context sentence and the sentence containing the critical pronoun are transitive ergative-absolutive clauses. Therefore, the absolutive pronoun in object position is expected to prefer as its antecedent the absolutive argument: they bear the same case, have the same grammatical function (and are also both the patient of the event). Alternatively, given that subjects have been shown to be preferred as antecedents in languages such as English, then, if Niuean ergative arguments are indeed subjects (e.g. Seiter 1980), we might expect a preference for the ergative argument. In 16b, the context sentence has an absolutive subject, whereas the critical absolutive pronoun appears in object position. Thus, case parallelism could create a bias for the absolutive subject (in this case we cannot make predictions based on grammatical role which is an open question for the sentence containing the pronoun). In 16c, again, the context sentence has an absolutive subject, and the critical absolutive pronoun appears in object position in the second conjunct, and so similar predictions apply as in 16b.

Because Niuean is mostly used in conversational settings, a study based on written language is not appropriate here (see Longenbaugh & Polinsky 2016 for discussion). The stimuli were therefore presented auditorily, and participants were asked to "act out" the described events using pictures on a display board – see Figure 2; we emphasized that the selection of picture cards was more important than the acting out of the event itself. In this setup, the choice of pictures reveals how participants interpret the pronoun, similar to Brown-Schmidt, Byron and Tanenhaus 2005.

FIGURE 2. Example display board, which was coupled with the examples in Table 1.

We note that experimental research of this type contributes to a growing body of literature comprising what has been referred to as FIELD PSYCHOLINGUISTICS (Christianson & Cho 2009), namely psycholinguistic studies conducted on-site with under-studied languages. This contrasts with the bulk of psycholinguistic research which has focused on languages that are spoken in Western, Educated, Industrialized, Rich and Democratic societies (a.k.a. WEIRD: Henrich et al. 2010; Majid & Levinson 2010). Field psycholinguistics poses unique challenges and limitations (for discussion, see Wagers & Chung to appear). One of the most pertinent is that conducting experiments in the field usually entails that data collection takes place outside the lab: in our case, participants were tested in open-air spaces (e.g. on sidewalks or village squares), and in their homes or workplaces. As a result of these testing conditions, the data tends to be nosier than data collected in a controlled laboratory setting. One option for offsetting this challenge might be to increase the number of participants tested. However, because Niuean has an extremely small number of speakers (under 7000; Siosikefu & Haberkorn 2008), recruiting a large number of participants is inherently more challenging; indeed, the forty-six participants who took part in this study comprise approximately 0.7% of the current Niuean-speaking population. A second option for offsetting this challenge would be to collect more data points per participant by employing a larger set of items. However, unlike most psycholinguistic research where participants are young adults, specifically university students who are used to testing environments, our participants were members of the general public; this posed constraints on the duration of the session which are less relevant when testing university students.

Despite these limitations, we maintain that Niuean offers a unique perspective to the study of language. This is because its morphosyntactic properties – the split ergative case marking system with three verb classes – allows for disentangling effects of case and transitivity which are central to understanding of the fundamental concept of 'subject' in natural language. We maintain that the theoretical import that the Niuean language has to offer outweighs the limitations introduced by the fieldwork nature of this research. We note, nevertheless, that the logistical limitations of carrying out this fieldwork research lead to a smaller sample (or item) size which affects statistical power: low power carries a higher risk of null results. As with all frequentist statistical analyses – regardless of the experimental setting or the profile of the language of investigation – a null result cannot be interpreted. That is, one cannot make a strong claim that an effect is ABSENT, merely that there is no current evidence to suggest that such an effect is PRESENT.

3. METHOD.

3.1. PARTICIPANTS. We report data from forty three participants; an additional 3 participants were tested but excluded from analysis because of equipment problems. Participants were native speakers of Niuean (mean age: approx. 40; range: approx. 18-65), tested in community settings on Niue Island (n = 33) and in Auckland and Christchurch, New Zealand (n = 10). Like all Niuean speakers, they were Niuean-English bilinguals. Participants were compensated $25 NZ for their time and effort.

3.2. MATERIALS AND DESIGN. Two factors were manipulated in a 3 (context sentence type) x 2 (pronoun position) within-subjects design. The first factor – context sentence type – determined the case frame of the verb in the context sentence, namely the FIRST conjunct, and had three levels: (i) a transitive verb with an ERG argument in subject position and an ABS argument in object position (Transitive-ERG), (ii) a transitive verb with an ABS subject and an obligatory OBL object ('middle' or Transitive-ABS), or (iii) an intransitive verb with an ABS subject and an optional OBL object (Intransitive-ABS). The target pronoun occurred in the second sentence, bearing absolutive case. The second factor manipulated the syntactic position of that pronoun,

and had two levels: (i) an absolutive pronoun in the subject position of an intransitive clause, and (ii) an absolutive pronoun in the object position of a transitive (ergative-absolutive) clause. Crossing the case frame of the antecedent sentence (Transitive-ERG, Transitive-ABS, Intransitive-ABS) with the position of the pronoun in the second sentence (subject vs. object) resulted in six experimental conditions. Example stimuli for these six conditions are given in Table 1.

	First conjunct	Second conjunct
Transitive-ERG / subject position	*Ne* ***tutuli*** *he kulī e lapiti,* PST chase ERG dog ABS rabbit 'The dog chased the rabbit,	*ti tihe* ***a ia***. and sneeze ABS 3SG and it sneezed.'
Transitive-ABS / subject position	*Ne* ***fakaalofa*** *e kulī ke he lapiti*, PST pity ABS dog OBL rabbit, 'The dog pitied the rabbit,	*ti tihe* ***a ia***. and sneeze ABS 3SG and it sneezed.'
Intransitive-ABS / subject position	*Ne* ***poi*** *e pusi ke he lapiti*, PST run ABS dog OBL rabbit, 'The dog ran to the rabbit,	*ti tihe* ***a ia***. and sneeze ABS 3SG and it sneezed.'
Transitive-ERG / object position	*Ne* ***tutuli*** *he kulī e lapiti,* PST chase ERG dog ABS rabbit 'The dog chased the rabbit,	*ti gagau he leona* ***a ia***. and bite ERG lion ABS 3SG and the lion bit it.'
Transitive-ABS / object position	*Ne* ***fakaalofa*** *e kulī ke he lapiti*, PST pity ABS dog OBL rabbit, 'The dog pitied the rabbit,	*ti gagau he leona* ***a ia***. and bite ERG lion ABS 3SG and the lion bit it.'
Intransitive-ABS / object position	*Ne* ***poi*** *e pusi ke he lapiti*, PST run ABS dog OBL rabbit, 'The dog ran to the rabbit,	*ti gagau he leona* ***a ia***. and bite ERG lion ABS 3SG and the lion bit it.'

TABLE 1. Example stimuli in the six conditions, crossing the three verb types in the context sentence (Transitive-ERG, Transitive-ABS, Intransitive-ABS) and the position of the pronoun (subject position vs. object position).

Twelve experimental sets of sentences were created for each of the six conditions. The characters participating in the events were all animals: we chose animals because they were easy to depict (compared, for example, with people of different occupations). The verbs were selected based on their case frame. Importantly, all items were created in consultation with, a native speaker of Niuean who also evaluated them for plausibility and naturalness. Each item was followed by a comprehension question, which targeted the first and second conjunct equally across items (questions were included to maintain trial structure with the filler items, which

served as experimental items in a separate experiment). All stimuli were recorded by a native speaker of Niuean.

Each experimental item was accompanied by a visual display that depicted the four animals – see again Figure 2. Two of the animals were mentioned in the first sentence, and when the pronoun was in object position, a third animal was mentioned in the subject position of the critical sentence; the fourth animal was not mentioned. Across items, the locations of animals were systematically changed to avoid any spatial contingencies with the order of mention.

Six presentation lists were created. Two items were assigned to each condition, and rotated using a modified Latin-square design. Thus, each item was presented in all six conditions, but any one participant saw only one version of that item. In addition to the twelve experimental items, each list also included twelve fillers (which served as the experimental items in another experiment). Fillers did not include a pronoun, and were not ambiguous in any other way. Like experimental items, fillers were comprised of two conjoined sentences, and were followed by a comprehension question, but, unlike experimental items, fillers mentioned all four animals. The resulting twenty-four trials were presented in a pseudo-randomized order, such that there were no adjacent trials in the same experimental condition. The twenty-four trials were preceded by three practice trials.

3.3. PROCEDURE. Participants were instructed that they should listen to the pre-recorded instructions, and use the images on the display board to "act out" the events described as much as possible given the limitations of the stimuli (for example, *chasing*, *nudging* and *hunting* are easier to "act out" than *looking*, *pitying* and *thanking*, where cards were simply held together). After hearing each sentence, the recording was paused, and the participant would choose cards from the display and manipulate them. Participants were told in advance that not all four animals would necessarily participate in every story. Next, they answered a question about the story by touching one of the cards.

The pre-recorded stimuli were played on a laptop over external speakers. A digital camcorder positioned beside the display board recorded participants' actions. The animals

chosen for the second sentence revealed how participants interpreted the pronoun. The entire session lasted about thirty minutes.

4. RESULTS. Each trial was coded for the image selected by the participant as the referent of the pronoun. Four trials (or 0.8% of the data) were excluded because there was no data due to equipment problems, leaving 512 trials for analysis.

To examine how pronouns were interpreted, we coded, for each trial, whether participants chose the antecedent that was mentioned in the subject position of the context sentence, namely the first argument position after the verb. This dependent variable allows us to maintain a unified coding scheme across the three verb types while staying neutral on the question of which argument counts as the grammatical subject in ergative-absolutive clauses (see again section 1.2). Recall that the grammar of Niuean allows for either interpretation, and so our question here is which interpretation is preferred in context.

Figure 3 plots the proportion of choosing the antecedent that appeared in the subject position of the context sentence across the six experimental conditions. Our first observation is that, across ALL conditions, participants chose the antecedent from subject position on most trials, namely more than the antecedent from object position. While this may be expected when the argument in the subject position was marked with absolutive case (i.e. in Transitive-ABS and Intransitive-ABS), this is an important finding when the argument in the subject position was Ergative (i.e. in Transitive-ERG), given the debate in the literature on which argument is the grammatical subject in ergative-absolutive clauses.

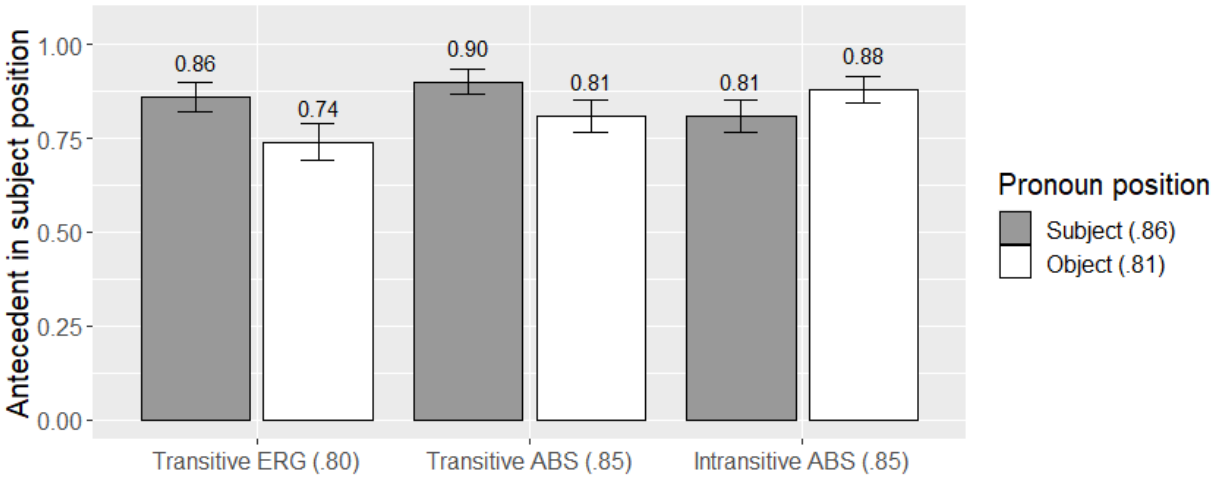

FIGURE 3. The proportions of choosing the antecedent mentioned in the subject position of the context sentence across the six conditions (error bars represent ± 1 Standard Error). The plot also provides the marginal means – in brackets.

To examine this pattern, we fitted a 3 x 2 mixed-effects logistic regression model with crossed, random effects for participants and items (Baayen, Davidson & Bates 2008, Jaeger 2008), as implemented in the LME4 package of the statistical software R 3.4.4 (Bates, Maechler, Bolker & Walker 2015, R core team 2015). The dependent variable was coded as 1 when participants chose the antecedent from the subject position of the context sentence and 0 otherwise (we note that all these choices were of antecedents in object position).

The independent variable Position (2 levels) was coded as -1/2 for a pronoun in subject position and 1/2 for a pronoun in object position: this contrast addresses the question of how the position of the pronoun affects interpretation. The independent variable Context sentence type (3 levels) was coded using Helmert contrasts, a coding scheme chosen to reflect our theoretical questions about effects of verb type. The first contrast codes the difference between Transitive-ERG (coefficient: +2/3) and the mean of Transitive-ABS and Intransitive-ABS (coefficient: -1/3 for each of the two conditions). This contrast, which is called ERG-ABS vs. ABS-OBL, asks whether the case frame of the context sentence affects pronoun interpretation, by testing the difference between the condition with an ERG-ABS case frame (Transitive-ERG) and the two conditions with an ABS-OBL case frame (Transitive-ABS and Intransitive-ABS, pooled). The second contrast codes the difference between Transitive-ABS (coefficient: -1/2) and Intransitive-

ABS (coefficient: 1/2). This contrast, which is called TransitiveABS vs. IntrasitiveABS, asks about any effects of the obligatoriness of the OBL object, by comparing Transitive-ABS where the OBL is obligatory and Intransitive-ABS where the OBL is optional (Transitive-ERG does not participate in this comparison, and its coefficient is 0).

We selected the most parsimonious model (Bates, Kliegl, Vasishth & Baayen 2015), starting with the maximal random effects structure that converged: that model included random slopes for all three predictors for both participants and items, but no interactions. We then simplified the model by removing random slopes that did not at least marginally improve the model (we used a conservative cut-off $p > .1$ for model comparisons). The final 3 x 2 model included random intercepts for participants and items, and a random slope for position for participants. This model is summarized in Table 2.

Effect	*β*	*SE*	*z*	*p*
Intercept	2.63	0.40	6.53	$6.42e^{-11}$
ERG-ABS vs. ABS-OBL	-0.49	0.32	-1.54	.12
TransitiveABS vs. IntransitiveABS	-0.07	0.39	-0.19	.85
Position	0.48	0.59	0.82	.41
ERG-ABS vs. ABS-OBL x Position	1.07	0.63	1.69	.09
TransitiveABS vs. IntransitiveABS x Position	-2.00	0.79	-2.54	.01
a) Position = *Subject:*				
ERG-ABS vs. ABS-OBL	0.05	0.47	0.10	.92
TransitiveABS vs. IntransitiveABS	-1.07	0.56	-1.90	.057
b) Position = *Object*:				
ERG-ABS vs. ABS-OBL	-1.02	0.42	-2.41	.01
TransitiveABS vs. IntransitiveABS	0.92	0.55	1.69	.09

TABLE 2. The 3 x 2 mixed-effects logistic regression model (top part) along with the effects of Context sentence type at each level of position (bottom part).

Note, first, that the overall intercept is meaningful here: its significance means that antecedents in subject position were overall chosen above 50% (the intercept is significantly different from 0, which in logit space is .5). The first contrast, ERG-ABS vs. ABS-OBL that tests for an effect of case, was not significant. Although we note that there were numerically fewer antecedents in subject position in ERG-ABS (i.e. Transitive-ERG: .80) compared to ABS-OBL

(i.e. the pooled Transitive-ABS and Intransitive-ABS: .85). The main effect of transitivity – Transitive-ABS vs. Intransitive-ABS – was also not significant (they were numerically the same: .85). Because the two contrasts together consider the effect of context sentence type, this means that the likelihood of interpreting pronouns as referring back to the antecedent in the subject position was not overall affected by the case frame of the verb in the context sentence. This is an important finding for an ergative language like Niuean, where the subject of Transitive-ABS and Intransitive-ABS is clear, but the subject of Transitive-ERG is widely debated (and thus we could have expected the opposite pattern, or an equal divide between the two arguments – see again section 1.2). We note that this result contrasts with the pattern observed in the processing of long-distance dependencies, in which the absolutive argument was shown to be preferred, creating an asymmetry between Transitive-ERG on the one hand and Transitive-ABS and Intransitive-ABS on the other (Tollan et al. 2019). We return to this disparity in the General Discussion.

The other main effect, position, was also not significant, although numerically pronouns in subject position were slightly more likely than pronouns in object position to be interpreted as referring to antecedents in subject position (subject pronoun: .86 vs. object pronoun: .81). However, the interaction of ERG-ABS vs. ABS-OBL and position was marginal, and the interaction of TransitiveABS vs. IntransitiveABS and Position was significant.[5] This reveals that pronouns in subject and object positions were affected differently by the verb of the context sentence. Thus, we unpack these interactions by examining the effects of case and transitivity for each level of the position, namely separately for pronouns in subject and object position. To this end, we used the same 3x2 model (with the same structure of random effects), but re-coded the predictor of position to examine the effects at each level (following West, Aiken & Krull 1996).[6] This is summarized at the bottom of Table 2.

For subject pronouns, there was no effect of case (ERG-ABS vs. ABS-OBL): Transitive-ERG did not differ from the pooled Transitive-ABS and Intransitive-ABS. The effect of transitivity (TransitiveABS vs. IntransitiveABS) was marginal: the antecedent from subject position was chosen more frequently after Transitive-ABS sentences (.90) than after Intransitive-ABS sentences (.81). Because the other choice of antecedent was the antecedent in object

position, this finding may reflect a trend for an optional object to become a topic of a subsequent sentence compared to an obligatory object.

A different pattern is found with pronouns in object position. First, here there is a significant effect of case (ERG-ABS vs. ABS-OBL), whereby antecedents from the subject position are significantly LESS preferred in the Transitive-ERG condition compared to the pooled ABS conditions (Transitive-ABS and Intransitive-ABS). This pattern could be due to case parallelism: when interpreting an object pronoun that bears ABS case, there is a preference for an antecedent that ALSO bears ABS case: in Transitive-ABS and Intransitive-ABS sentences, this is the antecedent in the subject position, but in Transitive-ERG sentences, this is the antecedent in OBJECT position which causes a reduction in choosing the ERG argument in subject position.

In addition, the interpretation of pronouns in object position also exhibits a reduction in the likelihood of choosing the antecedent in subject position in the Transitive-ABS condition than in the Intransitive-ABS condition (Transitive-ABS: .81 vs. Intransitive-ABS: .88), but this effect did not reach the conventional threshold of significance. Because the other choice of antecedent was the antecedent in object position, this reduction may hint to a preference to choose an OBLIGATORY nominal (i.e. an argument in Transitive-ABS) over an OPTIONAL nominal (i.e. an adjunct in Intransitive-ABS).

There are further indications in our data that pronouns in object position are influenced by more competing pressures than those in subject position. First, we note that there was more variability in the interpretation of object pronouns as compared with subject pronouns (this is reflected in the error bars in Figure 3). Second, participants' performance suggested that some experimental conditions were more burdensome than others. For example, out of the 512 trials, there were 33 trials where participants were markedly reluctant to decide on a referent, and had to be prompted by the experimenter to do so. Interestingly, these trials were not distributed evenly across the six conditions, but were most frequent in the Transitive-ERG: Object condition (11 of those trials were in this condition). On three of these trials, participants commented that the decision was difficult, offered justification for their eventual selection, and remarked that the task should be adjusted so as to use non-ambiguous language. The fact that it was the TRANSITIVE-ERG: OBJECT condition which prompted such responses suggests that this condition was particularly arduous as compared with the others (recall that this is the condition which

elicited the LOWEST proportion of antecedents from subject position). These behaviours suggest that participants were facing competing linguistic pressures that were not as prominent for other conditions: on the one hand, a preference for a referent that is thematically more prominent (i.e. the ergative argument), versus preference for a case- and/or grammatical function-matched referent (i.e. the absolutive argument) on the other).

Because parallelism effects rely on a comparison ACROSS different verbs, it is important to consider the extent to which the observed patterns could arise from differences in argument or event semantics. One specific concern is differences in thematic roles, which have been shown to affect pronoun resolution (e.g. Stevenson, Crawley & Kleinman 1994, Arnold 2001, 2010, Rohde & Kehler 2013). For example, thematic GOALS have been shown to be pronominalized more than SOURCES (e.g. Arnold 2001). Our materials, however, included agents, experiencers and patients. Specifically, Transitive-ERG verbs generally have an archetypal *agent* in subject position, and an AFFECTED PATIENT in object position, Transitive-ABS verbs most often take an EXPERIENCER in subject position and an UNAFFECTED PATIENT in object position (see Seiter 1980), and Intransitive-ABS verbs can have either an agent or an affected patient in subject position. In our materials, all Transitive-ERG and Intransitive-ABS verbs had thematic agent in subject position, whereas most Transitive-ABS verbs had an experiencer in that position. In object position, Transitive-ERG verbs had an affected object, whereas Transitive-ABS and Intransitive-ABS both had unaffected objects (cf. Beavers 2011). We note that, for all three verb types, the antecedents in subject position – which were all PROTO-AGENTS (Dowty 1991) – were consistently more agentive than the antecedents in object position, which were all PROTO-PATIENTS. In other words, the relative thematic prominence of the antecedent in subject position is always higher.

While we are not aware of any effects of pronoun interpretation that concern subtypes of proto-agents or proto-patients, we nonetheless considered whether the effect of case observed for absolutive pronouns in object position was carried by a preference for experiencer arguments (in Transitive-ABS) over agent arguments (in Transitive-ERG). We address this concern by focusing on a subset of the data, specifically items of which the Transitive-ABS conditions take agent rather than experiencer subjects (*fifitaki* ‘copy’ and *fakaaue* ‘thank’), just like in the Transitive-ERG and Intransitive-ABS conditions. The data for the items, where the antecedent in

subject position is an archetypal agent across all three verb types, comprised 25% of the full data set – see Figure 4. We note that this restricted item set, which controls for thematic roles more closely, exhibits the same overall pattern as before: specifically, when the pronoun was in object position, there were fewer antecedents in subject position for the Transitive-ERG condition (.59) than in either of the ABS conditions (.81 and .86). It therefore seems unlikely that the effect we attributed above to case parallelism is actually driven by the thematic roles of the antecedents.

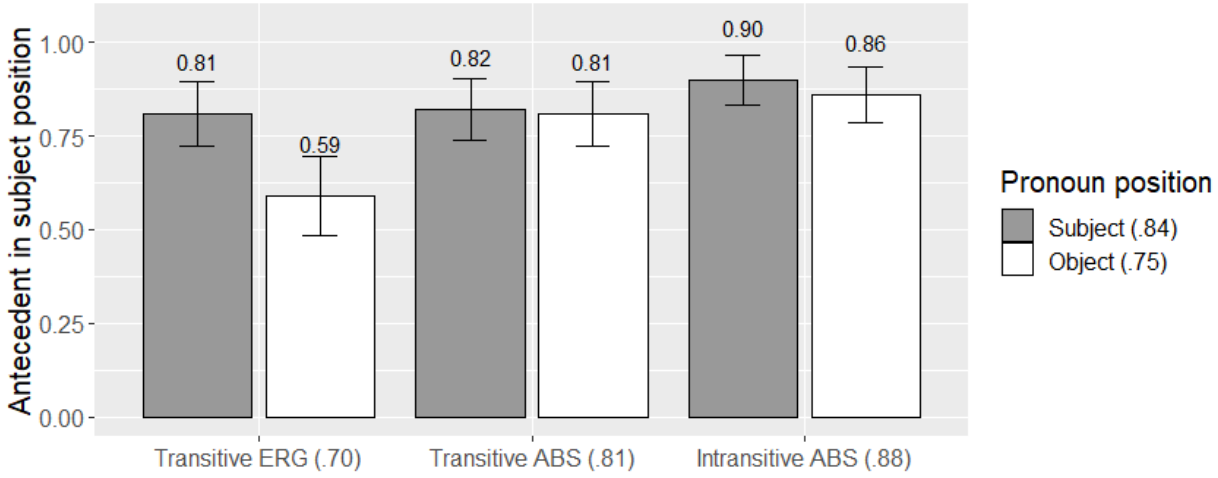

FIGURE 4. Proportions of choice of antecedents in subject position as the referent for anaphoric *ia* across the six conditions, focusing on those items where, in the Transitive-ABS condition, the subject was an archetypal agent (and not an experiencer).

5. GENERAL DISCUSSION. The current study is the first to examine pronoun resolution in an ergative-absolutive language. We find, first, that – independent of the position of the pronoun and the case frame of the context sentence – antecedents in subject position were overall preferred to antecedent in object position. In addition, we observe two effects with object pronouns: case parallelism and a hint of an effect of transitivity. We discuss these findings in reverse order.

The trend towards an effect of transitivity, whereby an antecedent that is an obligatory OBL argument (in Transitive-ABS) is slightly preferred over an optional adjunct (in Intransitive-ABS) as the antecedent of an object pronoun (this was reflected as in reduction of choosing the antecedent in subject position). This effect is interesting because differences between arguments and non-arguments have also been shown in environments that do not involve pronouns, with

arguments having a privileged status compared to adjuncts (e.g. Clifton, Speer & Abney 1991, Liversedge, Pickering, Branigan & van Gompel 1998, Schutze & Gibson 1999, Boland 2005, Rissman, Rawlins & Landau 2015). One possibility is that the preference for an obligatory argument over a non-obligatory adjunct as an antecedent is because obligatory elements are more accessible in the discourse model. Some support for this view comes from studies that examined the differences between goals, as in *John gave the book TO THE TEACHER*, and sources, as in *John received the book FROM THE TEACHER*, finding that pronouns are more likely to take the former as antecedents (Stevenson et al. 1994, Stevenson & Urbanowicz 1995, Wilson & Stevenson 1998). This is relevant here because goals are realized as arguments, whereas sources are realized as non-argument. The same pattern also obtains in pronoun production, where goal arguments are more likely to be realized as pronouns than source non-arguments, regardless of whether the pronoun itself occurs in object position (Arnold 2001) or in subject position (Rosa & Arnold 2017). Our finding potentially provides a new perspective on arguments and adjuncts as antecedents. Nevertheless, because the comparison across case frames entails a comparison across verbs that denote different events, we must keep in mind the possibility that the pattern is tied to the semantics of the specific verbs rather than the contrast between arguments and adjuncts.

A second effect observed with pronouns in object position is case parallelism, whereby a case-matched antecedent was preferred over a non-case-matched antecedent. Specifically, we found a preference for an antecedent that was also marked absolutive (i.e. in Transitive-ABS and Intransitive-ABS) compared to an antecedent marked ergative (i.e. in Transitive-ERG). This effect of case parallelism is reminiscent of parallelism effects reported for nominative-accusative languages, such as parallelism in grammatical function or thematic roles (Sheldon 1974, Grober, Beardsley & Caramazza 1978, Smyth 1992, 1994, Chambers & Smyth 1998). Again, because this effect requires comparing across different verb lexemes, it is important to consider whether the observed effect arises due to another difference ERG and ABS verbs. One such difference is THEMATIC ROLES, which are known to affect pronoun interpretation (e.g. Stevenson, Crawley & Kleinman 1994, Arnold 2001, 2010, Rohde & Kehler 2013). This could be relevant here because of systematic differences across verb types in which proto-agents roles appear in subject position (agent in Transitive-ERG and Intransitive-ABS and experiencer in Transitive-ABS) and which proto-patient roles appear in object position (affected patient in Transitive-ERG and unaffected

patient in the ABS conditions). Recall, however, that a consideration of a subset of the data in which the antecedent in subject position was a thematic agent across all three verb types, nevertheless showed the case parallelism pattern (see again Figure 4). While this possibility cannot be ruled out using the current dataset, it seems unlikely that a difference in the TYPE of patient would have a stronger effect on pronoun interpretation than the overt case of arguments. A second possible semantic difference between verbs could be 'next-mention' biases, namely the preference of which character will be mentioned next (Rohde & Kehler 2013). While this possibility can again not be ruled out based on the current results (these biases need to be estimated using production data), an overall semantic effect would likely have an effect on the interpretation of subject pronouns as well. However, here we find the effect with object pronouns only, which is similar to parallelism effects found in nominative-accusative languages (Chambers & Smyth 1998).[7]

The most important effect we observe here is the overall preference for antecedents in subject position, independent of the case frame of the verb. This finding is noteworthy because of the debate about the grammatical subject in ergative-absolutive clauses. If we interpret this finding against the background of the pronoun literature on nominative-accusative languages, where subjects are generally preferred over objects, then our finding that ergative arguments in subject position are preferred alongside absolutive subjects of intransitive and middle verbs constitutes support for the view that in transitive ergative-absolutive clauses, it is the ergative argument that functions as the grammatical subject (e.g. Seiter 1980), and against the view that the grammatical subject in these clauses is the absolutive argument (e.g. Biggs 1974, Sperlich 1994) or both (e.g. Massam 2001b). However, instead of using patterns of pronoun interpretation to shed light on the debate of subjecthood in Niuean, we propose that this finding should be used to rethink the existing generalization about the role of subjecthood in pronoun interpretation. Specifically, we propose that this pattern points to the possibility that 'accessibility' is not sensitive to grammatical roles as has usually been assumed in the literature (e.g. Gordon, Grosz & Gillom 1993, Arnold 2010). Instead, it may be determined solely by thematic prominence, with MORE AGENTIVE arguments (or the "proto-agent" in the sense of Dowty 1991) being more accessible. This alternative generalization captures the pattern we observe in Niuean, because, across all verbs, the argument in subject position is always more thematically prominent than the argument in object position (Transitive-ERG: agent-patient; Transitive-ABS: experiencer-

patient; Intransitive-ABS: agent-patient). Importantly, the same generalization can still capture the pattern observed in nominative-accusative languages, because (nominative) subjects are consistently more agentive than accusative objects (one should keep in mind, for example, that in passive sentences the agent is not an argument of the verb). As discussed earlier, thematic roles have already been shown to affect pronoun resolution (e.g. Stevenson, Crawley & Kleinman 1994, Arnold 2001, 2010, Rohde & Kehler 2013). It would therefore be attractive if we could characterize all the influences affecting pronoun resolution in term of thematic roles.

More generally, an important consequence of this alternative generalization is that it allows us to explain the contrast between the current findings about pronoun interpretation, and a previous finding about long distance dependencies in Niuean. Specifically, Tollan and colleagues 2019 examined the real-time processing of WH questions. Using a visual-world eye-tracking paradigm, the authors observed a preference for an absolutive dependency over an ergative dependency in a WH question comprising an ergative-absolutive verb like in 17a, during the temporarily ambiguous portion of the question (i.e. before the onset of the disambiguating case marker of the non-displaced DP; bolded in 17); an analogous preference was also found for absolutive subject dependencies for intransitive verbs with an absolutive subject and oblique adjunct as its clause-mate DP, as in 17b.

(17) a. Niuean transitive ERG-ABS wh question
Ko e pusi fē ne tutuli tūmau {__ e lapiti /he kulī__}?
PRED cat which PAST chase always ABS rabbit/ ERG dog
'Which cat {always chased the rabbit/did the dog always chase}?'

b. Niuean intransitive ABS-OBL wh question
Ko e pusi fē ne poi tūmau {__ ke he lapiti /e kulī ki ai}?
PRED cat which PAST run always OBL rabbit/ ABS dog OBL RP
'Which cat {always ran to the rabbit/did the dog always run to}?'

(Tollan et al. 2019: 4)

Across these verb types, Tollan and colleagues found that speakers of Niuean exhibit a preference for an ABSOLUTIVE dependency. Thus, in contrast to the current study, which shows a preference for ERGATIVE arguments in pronoun resolution, the processing of long-distance dependencies in Niuean shows an 'absolutive advantage' (Tollan et al. 2019).

Importantly, however, pronoun resolution is inherently an interpretive process, and may therefore be for the most part guided by semantic considerations such as relative thematic

prominence and agentivity.[8] In contrast, a long-distance dependency requires creating a formal syntactic link between two non-adjacent elements: an overt WH filler and a silent gap. As proposed in Tollan et al. 2019, forming an absolutive dependency may be less costly in Niuean because absolutive gaps occur in more syntactic environments than ergative gaps, and may therefore also be more frequent (cf. Gennari & MacDonald 2009, MacDonald 2013); note that WH phrases in Niuean are not case-marked themselves in any way. This same metric applies to nominative-accusative languages like English: nominative gaps, which occur in both transitive and intransitive sentences, are more widely distributed than accusative gaps, which are found in transitive sentences only. Therefore, nominative filler-gap dependencies are easier to process than accusative dependencies – this effect is known as the 'subject advantage'. Thus, the dependency formation process might be tied to the syntactic status of arguments in terms of their CASE MARKING, and not in terms of their thematic prominence, wherein nominative and absolutive case – collectively referred to as the "unmarked" cases (Dixon 1979) – are favored[9].

As has been argued by Aldridge (2004), properties associated with 'subjects' in nominative-accusative languages are distributed differently in ergative-absolutive languages: some characterize the ergative argument, while others characterize the absolutive argument. Here we find a contrast between pronoun resolution being sensitive to thematic prominence and dependency formation which has been argued to be sensitive to case marking. This raises the possibility that the notion of 'grammatical subject' is not, in fact, a primitive of natural language, but rather a devised label used when certain properties – thematic prominence and syntactic unmarkedness – happen to apply to a single argument. The focus of the literature on the more typologically abundant nominative-accusative languages, in which thematic prominence and syntactic unmarkedness align, has led to a situation where many generalizations are given using the term "grammatical subject". Examining the same processes in ergative-absolutive languages like Niuean offers an important perspective into the primitives that underlie this term.

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NOTES

[1] All unreferenced data in this paper are drawn from our own field notes; consultation took place in Auckland, New Zealand in Fall 2016, and in Niue in Spring 2017.

[2] Abbreviations used in glosses are as follows: ABS = absolutive, COMP = complementizer, ERG = ergative, FUT = future, OBL = oblique, PERF = perfective, PL = plural, PRED = predication, PST =past, REFL = reflexive, RP = resumptive pronoun, SG = singular, 3 = third person.

[3] Since the logic of the current study does not depend on adopting any particular formal analysis of case, we do not discuss any of this literature here. We refer the interested reader to Tollan (2019) and Massam (2020) who propose that case morphology in Niuean is not configurational (Marantz 1991; Baker 2015, a.o.), but is rather a product of case licensing via syntactic heads (Vergnaud, 1977, 2008; Chomsky, 1980, 1995, a.o.).

[4] The VSO order has an apparent exception, namely sentences with pseudo noun incorporation – as in (5) above – where the surface order may seem to be VOS. Note, first, that these are not part of our experimental materials. Moreover, note that the case marking in these clauses indicates that the apparent object is not, in fact, an argument of the verb: (i) unlike full DP objects in Niuean, this "object" is not case marked, and (ii) the subject argument in this clause (e.g. 5a) bears absolutive case and not ergative that characterizes transitive verbs.

[5] A different way to conceptualize this is to consider the overall 3x2 interaction. To examine this interaction, we compared a model that contained the interaction term with a model with only main effects, finding that the former explained significantly more variance ($\chi 2 = 9.89$, $df = 2$, $p = .007$). The same method indicated that the main effect of verb type is not significant ($p = .30$).

[6] This process is conceptually similar to breaking up the data into two subsets (subject pronouns and object pronouns) and running a separate statistical model for each of these subsets. The advantage of the method we used is that it allows for running the same tests in a single model, and therefore it takes into account all the variability in the dataset.

[7] Because we only investigated the interpretation of absolutive pronouns, the observed effect of parallelism is also consistent with the possibility that absolutive arguments are more generally preferred as antecedents due to the special status of absolutive case. Specifically, the "morphological case hierarchy" (Bobaljik, 2008) – originally pursued in order to capture typological generalizations concerning verb agreement patterns – posits that absolutive- and nominative-cased arguments (collectively referred to as 'unmarked' case; see Dixon, 1979, et

seq.) outrank ergative- and accusative-cased arguments (collectively referred to as 'dependent' case), which in turn outrank oblique-cased arguments. Ruling out this possibility would require investigating the interpretation of pronouns that bear ergative or oblique case.

[8] This generalization could also be stated in syntactic terms, as corresponding to structural c-command relations in the syntax (Reinhart, 1976): in Niuean, the merge position of ergative subject c-commands that of the absolutive object (see e.g. Massam 2020), and there is no proposed A-movement of the object past the subject (unless in pseudo-noun incorporation contexts; see Massam's 2001 analysis). This characterization is relevant to generative theories of syntactic ergativity which posit that absolutive objects in certain syntactically ergative languages A-move *above* ergative subjects (e.g. Bittner & Hale 1996; Aldridge 2004; Coon et al. 2014; see discussion in Deal, 2016), such that the subject is eventually c-commanded by the object. As of now, there are no studies of pronoun resolution in a syntactically ergative language: finding an overall preference for absolutive objects antecedents would indeed lend further support to this avenue of analysis.

[9] We note that absolutive case is not necessarily the "unmarked" case across all ergative languages: in Mayan languages, it is ergative case that has been characterized as "default" case (Imanishi, 2014). For example, whereas "split ergativity" in Niuean is characterized by *absolutive* case marking on transitive subjects, in Mayan languages split ergativity results in *ergative* case marking (see e.g. Coon, 2013 on Ch'ol). We would therefore expect ergative dependencies to be easier to process than absolutive ones; indeed, the Mayan languages Ch'ol and Q'anjob'al exhibit an advantage for long-distance dependencies of ergative arguments over those of absolutive arguments (Clemens et al., 2015).