Aleut Number Agreement

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Aleut is a seriously endangered group of dialects spoken in the fog-shrouded Aleutians by no more than 150 people. The grammar of this language, especially in its original state, is as clouded as the surroundings in which it is spoken, filled with mysteries and wonders that challenge numerous of the assumptions about languages that linguists have developed on the basis even of the hundreds of far-flung cases that have by now been described in reasonable detail.

1. Aleut and Eskimo

Aleut is the only certain relative of the Eskimo languages. Though it was once believed that the system of grammar found in Eskimo developed out of a system more like the Aleut, it is now generally agreed that things went the other way around. Eskimo languages have large inflectional paradigms in which the person and number of one or two entities are more-or-less explicitly coded on heads of phrases. Aleut presents a much withered set of contrasts. The reduction in the paradigms is particularly striking where there are two actants and both are third person.

For a particular set of such endings, viz. the absolutive of nouns and the indicative of verbs, Berglsland 1997a reconstructs the following forms for Proto-Eskimo-Aleut, where EC ("External Category) is the number of the possessor for the noun and of the Ergative case term for the verb, and IC is the number of the noun itself or of the Absolutive term for the verb. (See also Fortescue et al. 1994):

EC	sg.	du.	pl.
IC			
sg.	-(ng)a	-(ng)ak	-(ng)at
du.	-k	-kek	-ket
pl.	-(ng)i	-(ng)ik	-(ng)it

Table 1. Proto-Eskimo-Aleut third person on third person inflections

In Aleut, the descendant of this transitive paradigm, which Bergsland 1997b (henceforth "AG") calls the anaphoric or referential endings, shows only one category of

number agreement which we can immediately see matches the diagonal in Table 1., i.e., the forms where the number of both actants is the same:

sg.	du.	pl.
-a	-kix	-ngis (ngin)

Table 2. Aleut third person anaphoric (referential) inflections

Eskimo also has a set of inflections for unpossessed nouns and intransitive verbs those in Table 3. being the reconstructions for the absolutive case form of nouns and the indicative mood of verbs:

sg.	du.	pl.
-q	-k	-t

Table 3. Proto-Eskimo-Aleut third person intransitive inflections

These have been inherited intact in Aleut:

sg.	du.	pl.
-x̂	-x	-s (-n)[1]

Table 4. Aleut third person non-anaphoric inflections

In both language groups there is also a case distinction that cross-cuts the other dimensions of inflection. The cases of Eskimo include two direct cases, the absolutive and the relative, so-called by Kleinschmidt 1968, and nowadays usually called the the ergative in Eskimo studies, and several oblique cases. In Aleut, however, ordinary nouns show a contrast only between absolutive and relative. The complete paradigm of third person inflections in Aleut for nouns and certain moods of the verb is found in Table 5., where "A" indicates the anaphoric endings, and non-A the non-anaphoric endings.

[1] The parenthesized forms are what is found in Eastern Aleut.

		sg.	du.	pl.
non-A	ABS	-x̂	-x	-s (-n)
	REL	-m	-x	-s (-n)
A	ABS	-a	-kix	-ngis (ngin)
	REL	-(g)an	-kin	-ngin

Table 5. Aleut third person inflections

In Eskimo the inflections are distributed in a rather ordinary way that is attested in a great many languages around the world. the transitive endings are always and only used for possessed nouns and for transitive verbs, The intransitive endings for unpossessed nouns and for formally intransitive verbs. Nouns agree with their possessors and display their own internal number, and verbs agree with the absolutive and ergative term or terms of the clause. The inflections are redundant when there is an overt possessor or overt terms and can be used alone to signal definite reference to a non-explicit possessor or non-explicit term of the clause. The relative case of Eskimo is used for the possessor of a noun and for the agent of a simple transitive verb (hence the designation "ergative").

As we shall see, the distribution of number morphology, the anaphoric versus non-anaphoric endings, and the absolutive versus relative cases are all quite different from the more-or-less ordinary facts of Eskimo.

2. The Aleut system

It should not be too surprising that the reduced paradigms of Aleut are redeployed in some fashion, but the degree and manner of the rearrangement is truly remarkable. One of the main reasons for the thoroughgoing rewriting of the inflectional job description in this language is that despite the apparent need for pronouns that the collapse of inflections would seem to have engendered, in fact there are no non-reflexive third person pronouns in Aleut at all, a point that Bergsland stressed repeatedly in his work.

What has happened is that the inflectional contrasts that are still available - the marking of the number of one participant, the distinction between anaphoric and non-anaphoric inflections, and the contrast of absolutive and relative - are used to signal features that would be carried by third-person pronouns (if there were any) almost anywhere in the domain of the inflected element. Thus it is not just features of the possessor of an NP that can be recorded on the possessum, but also features of the possessor of the possessor, if that entity has the discourse status of a pronoun. Likewise, it is by no means the case that only features of terms (i.e., arguments) show up inflectionally marked on verbs, but features of possessors of the arguments, of non-arguments, and indeed, elements of subordinate clauses, provided these are in the sort of relation to the discourse that usually invokes pronominal reference in languages that have pronouns or the equivalent of them.

This system makes maximum use of its very limited referential powers. Many of the most basic ambiguities that might arise in a language that lacks third person pronouns are in fact resolved by the number/anaphoricity/case contrasts. Part of the trick is that two of the dimensions of inflection, the number marking and the anaphoric marking, operate independently and can therefore sometimes signal the values of two separate non-explicit participants. The principles of number marking, while remarkable from a cross linguistic perspective, are reasonably clear and will form the substance of this study. It will be necessary to touch on the equally strange, and partly similar principles governing the appearance of anaphoric versus non-anaphoric forms of verbs, but the details of this system are too complex to deal with in a paper of this length.

2.1 Number marking in the NP

Formally possessed[2] nouns in Aleut always bear the anaphoric affixes, indicated by "A" in morpheme glosses, as opposed to the non-anaphoric inflections, which will not be specially indicated. When the possessor of the NP is fully specified in the relative case ("REL"), the number of the affix on the possessum generally reflects the number of the possessum itself.

(1) hla-s ada-a
boy-pl father-A/sg "the boys' father"
(2) tayaĝu-m hla-ngis
man-REL/sg boy-A/pl "the man's sons"

The possessor may be left out and understood as definite, just as in Eskimo, but when this happens in Aleut, the number marking on the head can reflect the number of the head **or** of the possessor, the choice usually being in favor of the term with the higher number. (See Leer 1991 for an enlightening cross-linguistic discussion of this phenomenon.) With the singular number, then, both the possessed noun and the non-overt possessor must be understood as singular. If either or both the non-explicit possessor or the possessed is to be understood as plural, the plural inflection must be used.

(3) hla-a
son-A/sg "his son"

(4) hla-ngis
son-A/pl "his/her sons; their son/sons"

2.2 Number of the non-anaphoric verb.

The non-anaphoric verb generally agrees with a fully specified nominal subject in number:

(5) aliĝ-in awa-na-n-ulux
old.man-pl work-PAST-pl-not "The old men did not work."
(6) Piitra-x̂ asx̂inu-s kidu-ku-x̂
Peter-sg girl-pl help-PRES-sg "Peter is helping the girls."

[2] For a description of the great variety of relationships expressed by "possessors" in Aleut, see my (ref).

As is to be expected, the subject may be absent, its reference and number carried by the verb's inflection, and the subject being understood as definite. Thus *awananulux* is a complete sentence meaning "they did not work", and *asx̂inus kidukux̂* means "he/she is helping the girls.

If the subject is possessed and the possessor is fully specified, the number of the the subject is carried over to the verb as above, in the fashion familiar from many languages including English.

(7) hla-s ada-a awa-ku-x̂ (130)
boy-pl father-A/sg work-PRES-sg "The boys' father is working."

But when the possessor of the subject is missing, there is a surprise: in such a case, the number marking of the verb "as a general rule"[3] (AG 131) reflects not the number of the subject, but number of the missing possessor.

(8) kita-ngis hataĝ-na-x̂ ax̂ta-na-x̂
foot-A/pl slip-PAST-sg appear-PAST-sg
"his feet apparently slipped" (AG 131)

2.3 Anaphoric V marking

The appearance of anaphoric inflection on a verb is also connected with the absence in surface form of some NP, in which case the reference is understood as contextually definite. In fact, anaphoric verb marking **requires** that there be a semantically understood participant that is not reflected in the overt form of the sentence. The following examples illustrate the phenomenon:

(9) a. Piitra-x̂ tayaĝu-x̂ kidu-ku-x̂
Peter-3/s man-3/s help-pres-3/s
"Peter is helping the man." (AG 126)
b. Piitra-m kidu-ku-u
Peter-3/rel/s help-pres-3/A/s
"Peter is helping him/her." (AG 126)

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[3] Several counterexamples from Eastern Aleut are presented in Bergsland (AG:132 (ref), including:

(i) ada-ngis hiing a-ku-x̂
father-A/pl here be-PRES-sg
"Their father is here."

Atkan Aleut and older Eastern would have the plural *akus* here, indicating the number of the non-explicit possessor.

(10) a. Piitra-x̂ tayaĝu-m had-a-n huya-ku-x̂
Peter-3/s man-3/rel/s direction-A/loc go-pres-3/s
"Peter is going toward the man." (AG 126)
b. Piitra-m had-a-n huya-ku-u
Peter-3/rel/s direction-A/loc go-pres-3/A/s
"Peter is going toward him/her."(AG 127)

(11) a. Piitra-x̂ hla-s ada-a kidu-ku-x̂
Peter-3/s boy-pl. father-3/A/s help-pres-3/s
"Peter is helping the boys' father." (AG 144)
b. Piitra-m ada-ngis kidu-ku-ngis
Peter-3/rel/s father-3/A/pl help-pres-3/A/pl
"Peter is helping their father." (AG 144)

In the a. examples we find a non-anaphoric verb form and an absolutive case subject. In the b. examples, there is something missing from the predicate, the verb form is anaphoric, and the subject is in the relative case. Note that the anaphoric form is required not only when the object is missing, but also when the object of what is arguably a postposition is missing (as in 10)) or when the possessor of the object is missing (cf. (11)).

2.4 Number marking of anaphoric verbs

As just described, anaphoric verb marking only occurs when there is something missing outside of the subject. If there is just one piece of the predicate missing then the number of the missing element is marked on the verb, as in the following simple examples. In other words, as Leer 1987 observes, the number of a missing element takes precedence over the number of the subject.

(12) Piitra-m kidu-ku-ngis
P.-REL/sg help-PRES-A/pl "Peter is helping them"

(13) hla-s kidu-ku-u
boy-pl help-PRES-A/sg "the boys are helping him/her."

Example (11b) above shows that the same principles extend to missing possessors of objects. The number marking on the verb in that examples is neither that of the subject, nor of the object, but of the missing **possessor** of the object.

If there is more than one missing item in the clause, they all compete for number marking on the verb, the general scheme being that the one(s) with the highest number wins. The competition includes elements missing form both subject and object and for this reason, the sentence in (14) can have any of the translations shown.

(14) kidu-ku-ngis
help-PRES-A/pl "He/she helped them./They helped him/her/them."

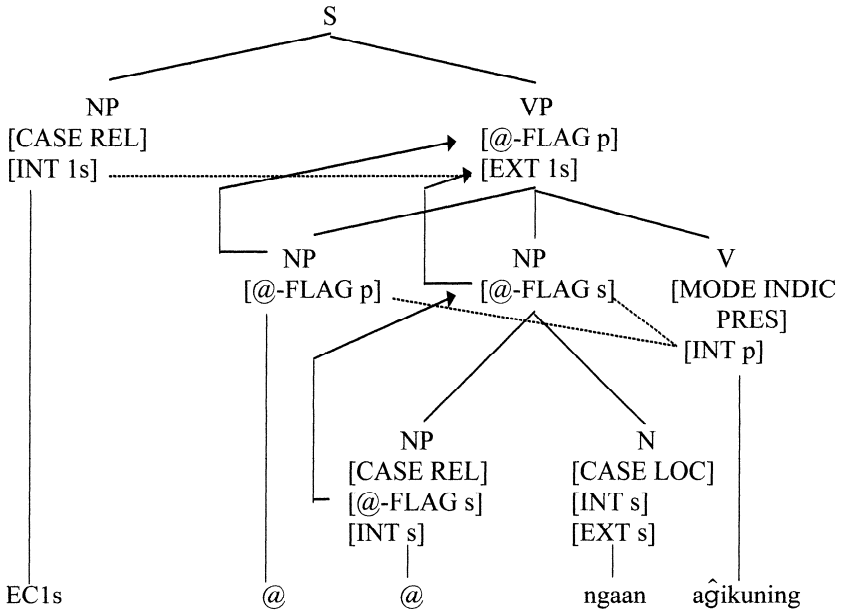
3. Previous accounts

There have been very few attempt to handle the facts of Aleut in a generative framework. Michael Fortescue (1985) produced an analysis in the framework of Dik's Functional Grammar (1978) that rests heavily on notions like Topic and Theme. Jeff Leer (1987a, 1987b) wrote extensively on the problem in a modified Generalized Phrase Structure Grammar framework, but felt it necessary to add transformational movement rules. More recently, in a paper mainly devoted to a different language, Ken Hale (1997) included a very brief sketch of some of the basic facts of Aleut that followed a version of Principles and Parameters/Minimalism Theory. I think it is fair to say that all of these accounts have come to grief. While I don't have the space to undertake a detailed criticism of these works here, but I would like to briefly compare the treatment I am about to give with Leer's and Hale's ideas.

The crux of the problem of Aleut agreement is clearly the handling of the missing elements that the inflection gives clues to. Leer assumes that these are present in the syntactic structure as empty NPs bearing number features as well as a special feature that he calls [@-FLAG]. The [@-FLAG] and number features spread up the tree from wherever they originate according to the scheme of "foot features" of GPSG (Gazdar et al. 1985). If two come together at a single node, only the one with the higher number survives to rise higher in the tree. A verb that inherits the [@-FLAG] feature will be inflected as anaphoric. Leer assumes NP VP structure for the clause, so empty NPs in the subject will not reach the verb and will not induce anaphoric marking. But the number features from an empty element in the subject, will reach the S node, from which point they are spread downward to VP, since they are assumed to be both "head features" and "foot features" (Gazdar et al. 1985). When they reach the verb, the number features that originate from the subject will compete with number features that have spread upwards from within VP, the highest number winning, as before.

Without going into more detail, I reproduce a tree from Leer 1987 to illustrate his intricate system. The solid arrows indicate the passage of foot features, the dotted arrows the passage of head features.

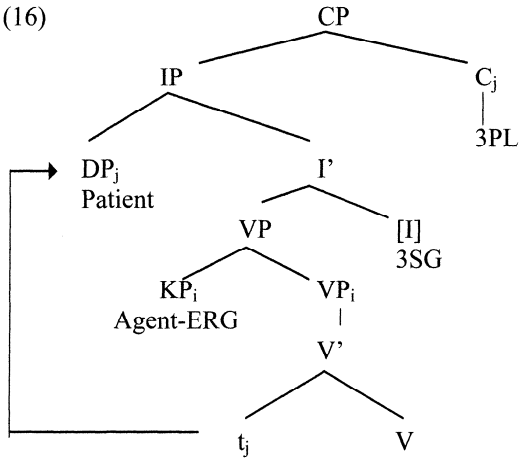
(15) "I gave it to them."



Hale employs a version of Bittner and Hale's (1996) theory of ergativity according to which an intransitive subject or a transitive object must raise to Spec of IP where it is assigned absolutive case by agreement with features in C. The raising is necessitated by the assumption that in a syntactically ergative language, "... the VP is opaque to government at S-Structure. The nominative argument (i.e., the object of the transitive .. and the subject of the intransitive ...) must therefore raise to [Spec, IP] to satisfy a filter that requires it to be governed by C or K ..." The subject of a transitive is then trapped in VP where it cannot get nominative case because the VP is opaque to government and therefore receives marked Structural Case, which in Inuit is the ergative case, for reasons too intricate for me to fully present here.

Bittner's tree for a transitive sentence with a plural object is accordingly:

(16)



Hale extends this to Aleut by saying that "We can simply say that when the object is non-overt – so-called small *pro* – it fails to be case-marked by the verb, for some reason, and therefore raises ..."

It is perhaps unfair to criticize this analysis here, since it is first of all based upon limited data and secondly is meant to be only a suggestion. There are however, several serious problems with a treatment of this kind that I believe illustrate the futility of handling Aleut agreement this way. Two such problems will have to suffice here. First, it is not just objects that do that can trigger the Aleut Effict, but also objects of prepositions, as illustrated in (10) above. Here Hale says: "Suppose, however, that the raising is forced by the postposition, unable to license the non-overt argument for some reason." But this will also have to be the case for the **possessor of the object**, as we have seen. One could also say that the structure fails to assign ergative case "for some reason", but what is the reason? Whatever it is, it cannot be Bittner's reason, for that is a parameter covering the whole language that should hold for all subjects of intransitives and objects of transitives - and only for them. The second problem is that where there is a missing subject (or possessor of the subject) and a missing object (or possessor of the object), they compete for number marking on the verb, as we have seen. In such a case the verb is necessarily anaphoric and the subject is in the relative case. (i.e. Hale and Bittner's ergative). Therefore the object must have raised, stranding the subject. But the number marking of the verb can at the same time be the number of the **subject** or the **possessor of the subject**, if either of these happens to be higher than the number of the object (or the possessor of the object). Thus (14) can mean, inter alia "Their father is helping him", where the anaphoric verb form would indicate for Hale that the object has been raised, but the plural verb form should mean that the subject has been raised. As far as I can tell, both things can't be true at the same time.

4. A Neo-Bergslandian approach

Recall Bergsland's repeated claim that Aleut lacks third person pronouns. Both Hale's and Leer's solutions, however, postulate a sort of third person pronoun, albeit an empty one, in the syntax of the language. Both theories are, in rather different ways, versions of the old fashioned Americanist view (Kroeber 1909, or more modernly, Jelinek 1984) that certain languages have incorporated their pronouns into verbs as inflections, Hale's much more directly so than Leer's, since Hale has the pronouns move around so as to nestle close to the source of the inflectional feature, while Leer merely transmits features around the tree in the manner of traditional concord systems. In any case, Leer's "@" is a sort of a null pronoun.

The problem with the view that Aleut null agreement involves a pronoun is that the language really has pronouns (in the first, second, and reflexive persons) that can show up as inflections. Such morphologically realized pronouns work completely differently from the supposed empty pronouns in the third person. Compare the following examples where a first person pronoun, realized as inflection on the noun or verb, with the corresponding third-person forms:

(17) a. hla-ngis mika-ku-x̂
boy-A/pl play-PRES-sg "His/her sons are playing."

b. hla-ning mika-ku-s
boy-1sg/pl play-PRES-sg "my sons are playing"

(18) a. tayaĝ̂u-m hla-a kidu-ku-u
man-REL/sg boy-A/sg help-PRES-A/sg
"The man is helping his (another's) son."

b. tayaĝ̂u-m hla-ng kidu-ku-x̂
man-REL/sg boy-1sg/sg help-PRES/sg
"The man is helping my son."

In (17a) we see that the number of the missing third-person possessor is what is marked on the verb, not the number of the subject itself. With an incorporated first-person pronominal possessor as in (17b), though, the number of the subject itself is what is reflected on the verb. In (18a) we see that the Aleut Effect is triggered by a third person possessor of the object, whereas it is not triggered by a first person possessor in (18b), even though both are marked inflectionally. First person possession thus counts as a fully specified NP – a pronoun.

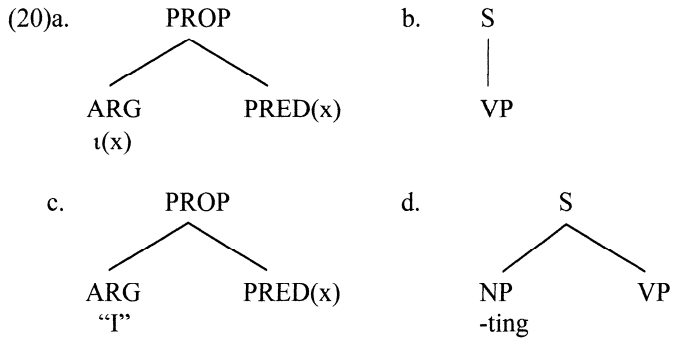
So I would like to take Bergsland seriously and assume that where we would expect a pronoun in the syntax, in fact there is nothing. But what about the understood reference to a third person entity? Well, the way I have become accustomed to thinking about things grammatical, reference is a matter of semantics and semantics is to be located in the semantic component, not the syntax. There is, of course, a close association in both directions between definite, discourse supported reference in the semantics of languages and definite pronouns in their syntaxes, but the correlation is not perfect in either direction. there are definite pronouns without reference (e.g., expletive *it* in English) and there are references without (real) pronouns (e.g., the subjects of English imperatives).

Suppose then that wherever NPs are called for in the syntax of Aleut, they are optional, and the following schema holds generally for the language:

(19) X → ... (NP) ...

In other words, for every syntactic phrase type that includes an NP, there is another just like it, but without the NP.[4]

However, referential expressions in the semantics, that is to say arguments, are not optional, else meaning structures would be ill formed. Suppose we have a meaning structure such as (20a), where the symbolism ι(x) represents the content of a definite, third person pronoun. If Aleut has no syntactic forms to encode this content, but does have the possibility of omitting NPs, then (20b), say the single word *hilakuχ̂* "he/she is reading" is the best match it has in its syntactic repertoire for the content in (20a). Furthermore, (20b) cannot encode any other meaning structure with a more specific argument, a first person pronoun, say, or a descriptive argument, since the language does have expressions that specifically encode such content. The meaning structure in (20c) is directly matched by the syntax in (20d), where it so happens that the pronoun subject is realized as verbal morphology in an expression like hilakuq(ing) "I am reading".



Bergsland's assumption is sufficient all by itself to account for the fact that Aleut sentences with missing NPs are interpreted as if they had third person pronouns in them.

5. The Efficiency of Aleut

Regardless of how outlandish the Aleut system of number and anaphoricity marking might appear, it is remarkably efficient in signaling meaning, as Leer (1987) has trenchantly observed. With just a few inflectional contrasts in the third person, and with a single case distinction, numerous potential ambiguities are eliminated. Consider a verb like *qa-* "eat", which can either be used transitively or intransitively. With one explicit and fully specified NP, the case of the NP and the anaphoricity of the verb will partly determine whether the term is a transitive or intransitive subject or a transitive object. For example, the sentence *qa-m qa-ku-u*, with a relative case NP and an anaphoric verb form (fish-REL/sg eat-PRES-A/sg) can only mean "The fish is eating it."

[4] This is the equivalent of a metarule in the formalism of Gazdar et al. (ref).

If the number of the verb disagrees with the that of the single term, there is a further narrowing of interpretation. Thus *qa-x̂ qa-ku-s*, with a singular absolutive term and a non-anaphoric plural verb (fish-sg eat-PRES-pl), can only mean "They are eating the fish.", while *qa-s qaku-x̂* (fish-pl eat-PRES-sg) is unambiguously "He/she is eating the fishes."

There are further clarifications that result when one or the other term has a missing possessor. The sequence *hlam* "boy-REL/s" *adaa* "father-A/s" could. wout of context, represent a single term "the boy's father (absolutive)" or two terms "the boy (relative)" and "his father (absolutive)". But the verb form will often clear up the ambiguity. *Hla-m ada-a awa-ku- x̂* (boy-REL/sg father-A/sg work-PRES-sg) means "The boy's father is working." and *hla-m ada-a ukux̂ta-na-x̂.* (boy-REL/sg father-A/sg see-PRES-sg) is "He/she saw the boy's father."

I leave it as an exercise to the reader to figure out why these forms have the interpretations they do and no others.

The cunning design of the Aleut agreement system, I wish to suggest, cannot be captured by a traditional set of grammatical rules, which will necessarily miss the fact that maximum use is made of minimal resources. Rather, I would like explore the possibility that Aleut agreement is a matter of grammatical constraints, or forces, or tendencies rather than rules. These sometimes conflict, but in the aggregate they do a good job of signaling meaning without specifically encoding it. It has become stylish nowadays to shy away from rule-governed grammar and turn in the direction of declarative, constraint-based systems such as one finds in HPSG (Pollard and Sag 1994) or OT (Prince and Smolensky 1993). I urge such a view in the case of Aleut not because (or not just because) of its currency, but also because it does a much better job - and much simpler job - of handling the facts.

6. Principles of Aleut number agreement

A very simple and straightforward account of the central facts of Aleut number agreement can be achieved by factoring out four competing principles and establishing a pecking order among them.[5] These principles are all observed explicitly or implicitly in Leer's 1991 article and, as I shall show, are all attested in other languages. As a first approximation, these forces can be ranked in the order given, but with no ranking between (21a.i) and (21a.ii).

(21) a. i. INHER: A head reflects its inherent number
ii NULL: A head reflects the number of a missing element in its domain
b. HIGH: A head agrees with the highest numbered agreement trigger in its domain
c. SUBJ: A verb reflects the number of its subject

[5] Interestingly, Leer (1987a:21) credits John Goldsmith with the idea that "principles of priority that cover part of Aleut agreement. They are:
(i) personal E[mpty] C[ategory] > other
(ii) @ > overt NP
(iii) subject > non-subject
Principles (ii) and (iii) correspond exactly to my (21 a ii) and (21 c). I find the suggestion of such a system in 1987 nearly prescient.

The intuitive idea of the domain of a syntactic element is that it is the semantic constituent that corresponds to the maximal projection of which the syntactic element is the head.[6] I assume that a verb in Aleut heads a clause, so any element of the meaning of that clause is in the domain of the verb. The domain of a noun is any element within the argument corresponding to the NP of which the noun is the head.

6.1 Accounting for the facts

Let us now consider various cases of Aleut number agreement in increasing order of complexity. The simplest is that of an unpossessed noun. Here the only relevant constraint is INHER, since there is no subject, no missing element, and no competition among agreement triggers. Thus unpossessed nouns will ordinarily have suffixes that indicate the number of the noun itself: *hla-x̂* "the boy; *hla-s* "the boys".

The next case to consider is a possessed noun with explicit possessor, where NULL is obviously irrelevant. Whether or not we take the possessor to be a subject, the constraint INHER outranks agreement with the subject, and since there are not other agreement triggers, HIGH will not play any rule. Thus each head will bear its own inherent number: *tayaĝ̂u-m hla-a* "the man's son"; *tayaĝ̂u-s hla-a* "the men's son"; *tayaĝ̂u-m hla-ngis* "the man's sons"; *tayaĝ̂u-s hla-ngis* "the men's sons":

Now let us take up the case of a possessed noun with a null possessor. Here NULL and INHER are both applicable, but only one can be satisfied since there is only one number that can be marked on the head. Since NULL and INHER are unranked with respect to each other, the contest will be decided by the constraint HIGH. For this reason *hla-ngis*, though marked plural, can be interpreted as "their son" with a plural possessor and a singular possessum. Constraint satisfaction arrays for *hla-ngis* and *hla-a* as alternatives for expressing meanings where the number of the head and the possessor disagree are compared in (22) and (23).

(22) "their son"

	NULL	=	INHER	HIGH	SUBJ
hla-ngis	√		*	√	-
hla-a	*		√	*	–

[6] For those who are fond of formalism for its own sake:

Let S be a syntactic expression and PROP be its semantic representation.

Let X be a syntactic head in S and XP the first maximal projection dominating it.

By definition, a meaningful element is any constituent of S whose meaning is represented by some semantic constituent in PROP

The *semantic domain* of X is the smallest semantic constituent in PROP that contains all the meaningful elements dominated by XP

(23) "his/her sons"

	NULL =	INHER	HIGH	SUBJ
hla-ngis	*	√	√	–
hla-a	√	*	*	–

Let us next examine how verbs work in this system. In the following examples, only the form of the verb is being considered, the form of the nominal terms being handled in the manner just discussed. First, if there is a fully specified subject present and there is no competition from null elements elsewhere in the sentence, the only relavant constraint is SUBJ, since verbs have no intrinsic number. Thus *tayaĝ̂u-s awaku-s* is grammatical and means "the men are working", whereas *tayaĝ̂u-s awaku-x̂*, with singular agreement on the verb is ungrammatical. Likewise *tayaĝ̂u-x̂ hla-s kiduku-x̂* is grammatical and means "The man is helping the boys", while **tayaĝ̂u-x̂ hla-s kiduku-s*, which fails to show agreement with the subject, is ungrammatical.

If the entire subject is missing, NULL comes into play. Here the number of the subject and the number of the missing element are of course the same, and therefore *awaku-s* will only mean "They are working" and *awaku-x̂* will only mean "He/she is working." Similarly, with a missing subject and a fully specified object, the verb agreement will give the number of the subject: *hla-x̂ kiduku-x̂* "he/she is helping the boy"; *hla-x̂ kiduku-s* "they are helping the boy." If this latter sentence were to mean "he is helping the boy", there would be unnecessary violations of both NULL and SUBJ.(24) "they are helping the boy"

(24) "they are helping the boy"

	NULL	INHER	HIGH	SUBJ
*hlax̂ kiduku-x̂	*	–	–	*
hlax̂ kiduku-s	√	–	–	√

Next, let us examine the case where the possessor of the subject, and nothing else, is missing. We have already seen example (8) above, where the singular possessor of a plural subject is missing and the verb is singular in agreement with the missing possessor. Similarly, a missing plural possessor of a singular subject will trigger plural agreement on the verb. These two case, when compared to their possible alternatives with the opposite verb agreement, are what demonstrate the greater strength of NULL with respect to both HIGH and SUBJ, as the following constraint-satisfaction tables show.

(25) "his feet slipped"

	NULL	INHER	HIGH	SUBJ
* kitangis hatag̑nas	*	–	√	√
kitangis hatag̑nax̂	√	–	* *	

(26) "their father is working"

	NULL	INHER	HIGH	SUBJ
*adangis awakux̂	*	–	*	√
adangis awakus	√	–	√	*

There is another case, namely where the possessor of a relative-case subject is missing and there is a transitive verb with a specified object. The system here predicts that the verb will agree in number with the missing possessor, but I have not been able to find a clear example of it:

(27) "Their father took the fish" (hypothetical)

	NULL	INHER	HIGH	SUBJ
ada-ngin qa-x̂ su-qa-ngis	√	–	√	*
ada-ngin qa-x̂ su-qa-a	*	–	*	√

One of the most unusual features of the Aleut agreement system is that it extends to subordinate clauses, missing elements of which can have their features recorded on matrix verbs. The triggering of the Aleut effect on matrix verbs because of missing elements in subordinate clauses is a very complex affair having to do with the mood of the verb and coreference conditions between elements of the subordinate and superordinate verbs, but as far as number marking is concerned, things work mostly as predicted by the four ranked constraints that we have been examining.

The verb *ax̂ta-*, for example, is what Bergsland calls an auxiliary. It can take a finite clausal complement in the remote (i.e., PAST) tense, and is used to "indicate an inference about the past". Consider, then, the sentence *tukungis anas ax̂takus* "He was [it is said] their chief", where both the subordinate and the matrix clause verbs agree with the missing possessor of the subordinate clause subject.

(28) *tuku-ngis* *a-na-s* *a$\hat{x}$ta-ku-s* (AG 210)
chief-A/pl be-PAST-pl seem-PRES-pl
"He was [it is said] their chief".

The same thing happens when the object of a transitive subordinate clause is missing. In the sentence *Piitram ukuqangis a$\hat{x}$takus* "Peter found them (they say)", we have a subordinate clause *Piitram ukuqangis* which could be an independent sentence meaning "He found them." Within this clause, the missing plural object triggers plural agreement, as we should now expect, and furthermore, the Aleut Effect is found: the verb is inflected for the anaphoric feature and the subject is in the relative case, since something outside the subject is missing.[7] As in the previous example, the verb agrees with the null element, here a missing subordinate clause object, since the constraint NULL is highly ranked and the missing term is in the domain of the matrix verb, though not in any grammatical relation with it.

(29) *Piitra-m* *uku-qa-ngis* *a$\hat{x}$ta-ku-s* (AG 210)
Peter-REL/sg find-PAST-A/pl seem-PRES-pl
"Peter found them (they say)."

The four forces I have identified are enough to correctly predict the number in these cases. The marking of number is not a matter of syntactic movement or anything of the kind, but simply an indication of the fact that there is a semantic reference that is not directly encoded by a pronoun in the syntax.

6.2 The ordinariness of Aleut

As unprecedented as the Aleut system is, looking at it as the interaction of separate violable constraints brings it to a certain extent in line with what is found in other languages. Subject agreement is, of course, completely pedestrian, as is the extremely widespread tendency for the number of a noun to be marked on the noun itself. These are two of the forces we have observed in Aleut. The predominance of the higher number is actually found in English as a growing tendency to say things like "Closing down conferences are always difficult", a real example produced by Dan Rostenkowski on July 13, 1993. Such examples are also facilitated by a pressure to agree with the nearest noun. But in my corpus of twenty or so examples of proximity agreement, I found only one example in which a singular overrode a plural, namely "What steps does the Sandinista government think is necessary?" (See Sadock 1998.)

As for NULL, there are languages like Breton, (Stump 1984) where only a missing subject triggers agreement. With an overt subject, the verb appears in an unmarked form, but when there is no subject, the verb marks the person and number of the subject:

[7] Note that the main-clause verb, while agreeing in number with the null element in the subordinate clause, does not show the Aleut effect.

(30)	a.	Levrioù	a	lenn(*-ont)	ar	vugale
		books	Pcl	read(*-pl)	the	children
		"The children read books"				
	b.	Levrioù a	lenn-ont			
		books Pcl	read-pl "They read books"			

Perhaps we should also include here the case of French predicate agreement. When the VP is intact, agreement is with the subject, but when the object is not present within the VP headed by the participle, it is the object whose features are registered:

(31) J'ai mis la chemise. "I have donned (m) the shirt(f)."
(32) la chemise que j'ai mise "the shirt(f) that I have donned(f)"
(33) Je l'ai mise. "I have donned(f) it(f) [i.e., the shirt(f)]."

Indeed, in Aleut the placement of the object before the subject creates a null in the predicate that requires number agreement (if nothing else competes) and triggers the Aleut Effect. I cannot find an example with unequivocal agreement, but (35), (Bergsland 1997b:11) illustrates the Aleut effect under inversion of subject and object, at least.

(34)	Paavila-$\hat{x}$	sistra-ng	ajaga$\hat{x}$ta-na-$\hat{x}$
	Paul-sg	sister-1s/sg	marry-PAST-sg "Paul married my sister."
(35)	sistra-ng	Paavila-m	ajaga$\hat{x}$ta-qa-a
	sister-1s/sg	Paul-sg	marry-PAST-sg "Paul married my sister."

7. Conclusions

What is odd about Aleut is not the factors that figure in determining agreement inflection, but how these factors interact. In particular, marking of nouns for their inherent number and verbs for the number of their subjects, while figuring in the inflectional system of this language, play a smaller role than they do in other languages. But there is a reason. Given that there are no third person pronouns in Aleut, number marking is deployed in such a way as to maximize its communicative value. This maximization of effect, it seems to me, is entirely obscured in a rule-governed system. But by separating out the forces, we can see that their ordering is motivated functionally, at least to some extent. In particular, the fact that subject agreement is the least important factor in Aleut agreement is understandable since subject agreement is often redundant and of little communicative value.

I have not dealt here with anaphoric agreement, or the Aleut Effect, as I call it. Preliminary consideration of the phenomenon suggests that it can be modeled in much the same way as number agreement. But the demonstration of that suspicion must wait for a subsequent study.

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