SQUIB: FEATURE-MATCHING AND CASE AND NUMBER DISSOCIATION IN HIAKI[1]

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ABSTRACT

There is a broad range of theoretical proposals regarding the implementation of the feature-copying or feature-matching operation that must lie behind the phenomenon of agreement in natural language. A particularly current subtopic in this broader landscape of theoretical debate concerns whether features in a single bundle can get their values from independent targets— the 'All-or-nothing' question (Bejar 2008). In this preliminary investigation, data from Hiaki DPs illustrate a case in which features on a single X° are valued by separate controllers, and raise locality issues for theories of concord and agreement.

KEY WORDS: Agree, concord, probe, Yaqui, case, number, determiner

1. INTRODUCTION

The Hiaki[2] DP presents a deceptively simple paradigm of data that present a deep puzzle for current theories of case and agreement. A c-commanding head has two sets of features that must be valued, and those features are apparently valued by two separate targets—even though the most local target should be able to value both of the features in question. The data require but a moment to describe, but understanding how the system works in terms of current theoretical understanding is proving very difficult. In this preliminary investigation, I present the key data, outline the theoretical puzzle, and describe some possible approaches to the problem, all of which present certain difficulties.

2. THE PUZZLE: CONSTITUENCY OF DET-POSS-N SEQUENCES

In Hiaki, as in many languages, basic noun phrases can consist of a pronoun, or a proper name, or a simple noun, or a determiner-noun sequence, all of which show a nominative/accusative contrast:

2. Hiaki is more familiarly known as Yaqui, or sometimes Yoeme. It is a Uto-Aztecan language spoken in southern Arizona and northern Mexico. In Arizona it is severely endangered, with fewer than one hundred elderly speakers remaining, but in Mexico less so; children still grow up speaking Hiaki as a first language in the Hiaki homeland in Sonora.

(1) a. inepo 'I' a'. nee 'me'
     b. Jose 'Jose.NOM' b'. Jose-ta 'Jose-ACC'
     c. uusi 'child.NOM' c'. uusi-ta ' child-ACC'
     d. uu uusi 'the.NOM child.NOM' d'. uka uusi-ta 'the.acc child-ACC'

Possessed noun phrases follow the order [Possessor-N]. The Possessor is marked with genitive, which is distinct from accusative only in the pronominal forms—otherwise, the genitive and accusative are morphologically identical. When the Possessor is a pronoun or a proper name, the pattern is very straightforward:

(2) a. in miisi a'. in miisi-ta
         my.GEN cat.NOM   my.GEN cat-ACC
         'my cat' (subject)   'my cat' (object)

     b. Jose-ta miisi b'. Jose-ta miisi-ta
         Jose-GEN cat.NOM   Jose-GEN cat.ACC
         'Jose's cat' (subject)   'Jose's cat' (object)

However, when the possesor is a bare noun, possessed DPs can contain one—and only one—determiner, which must precede the possessor:

(3) a. uu uusi-ta miisi
         the.NOM child-GEN cat.NOM
         'The child's cat' (subject)

     b. *uu uusi-ta uu miisi
         the.NOM child-GEN the.NOM cat.NOM

     c. *uusi-ta uu miisi
         child-GEN the.NOM cat.NOM

     d. *uka uusi-ta uu miisi
         the.ACC/GEN the.NOM child-GEN cat.NOM

     e. *uu uka uusi-ta miisi
         the.NOM the.ACC/GEN child-GEN cat.NOM

We might wonder, then, what the correct constituency of the Det-Possessor-N sequence exemplified in (3)a is. Does the possessor consist of a complex [Det-N] DP embedded within the possessed DP, like the DPs in (1d)? This structural possibility is sketched in (4)a. Or is the possessor a simple N DP, like that in (1c)? This structural possibility is sketched in (4)b.

(4) a. [[Det Poss]$_{DP}$ N]$_{DP}$
     b. [Det [Poss]$_{DP}$ N]$_{DP}$

How can we diagnose the correct structure? So far, agreement appears to indicate that the structure in (4b) is correct, since the determiner agrees in case with the head noun (as shown in (3a), as well as in (5a, c) below), not with the genitive possessor. The examples in (5) below are embedded in intransitive and transitive sentences to make the grammatical roles of the whole possessed DP perfectly clear.

(5) a. Uu uusi-ta miisi   siime.
         The.NOM child-GEN cat.NOM   go
         "The child's cat is leaving."

     b. *Uka uusi-ta   miisi   siime
         The.GEN/ACC child-GEN cat.NOM   go
         "The child's cat is leaving."

     c. Aapo   uka uusi-ta miisi-ta   vicha.
         He   the.ACC child-GEN cat-ACC   see
         "He sees the child's cat."

Note that in (5c), Genitive/Accusative syncretism means that we cannot clearly morphologically identify whether the determiner is agreeing with the accusative head noun or the genitive possessor. However, the contrast between (5a) and (5c) suggests strongly that the determiner is agreeing with the accusative head noun, as if it were agreeing with the genitive possessor, the form in (5b) should be possible, but it is not.

So far, all is very straightforward: The Determiner seems to introduce the whole complex NP. Determiners, then, may not occur as constituents with the following possessor noun in Hiaki; that noun, for unknown reasons, must surface with no determiner.

This contrasts with the situation in English. Number agreement (as well as other things) tells us that determiners are constituents with their following possessors, *not* with the head noun:

(6) a. Singular possessor, singular D: That_{sg} man_{sg}'s books_{pl}
                                            *Those_{pl} man_{sg}'s books_{pl}[3]

     b. Plural possessor, plural D: These_{pl} people_{pl}'s house_{sg}
                                            *That_{sg} people_{pl}'s house_{sg}

In (14) we see that number on the determiner agrees with number on the possessor N, not on the possessed N, in English. This tells us that the constituency in English Det-Possessor-N sequences is that in (4a), not that in (4b).

So far, we apparently have a minimal constrast between English and Hiaki Det-Possessor-N sequences: In the former, [Det Possessor] is a constituent, while in the latter, the Det forms a constituent only with the whole complex N, not with the Possessor.

Here, however, we come to the crux of the puzzle. Hiaki also has number agreement between nouns and their determiners. When a head noun is plural, the determiner is also plural:

(7) a. uu uusi   a'. ume uusi-m
         the.NOM.SG child.NOM.SG   the.PL child-PL

     b. uu miisi   b'. ume miisi-m
         the.NOM.SG cat.NOM.SG   the.PL cat-PL

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3. This is ok when 'man's books' is given a 'books for men' interpretation; in that case, it seems clear that D and N do not form a constituent, and determiner number is dependent on the number of the head noun.

What, then, are the facts concerning determiner number in Det-Possessor-N sequences in Hiaki? So far, our prediction is that the determiner should agree with the head N, as it does for case. The expectation is that the number of the possessor won't matter, but given a plural head N, we will see a plural determiner; with a singular head N, singular determiner. However, this is not the case. Examine the data in (8) below.

(8) a. Uu pahko'ola-ta tevevo-im   si   kuusi   *ume
         The.NOM.SG pascola-GEN.SG rattle-PL   very   loud   *the.pl
         "The pascola's rattles are very loud."

     b. Hunume yoeme-m karoo   au=koove-k   *uu
         That.PL man-PL car.SG.NOM   3sg.to=lose-prf   *the.nom.sg
         "Those men's car lost it (the race)."

     c. Hose   ume sontau-m trooke-ta   nasonta-k
         Jose   the.PL soldier-PL truck-ACC.SG   broke.tr-PRF
         "Jose broke the soldiers' truck."

In (8a), we see that a plural head noun does not trigger the plural determiner. The determiner is singular, like the possessor. In (8b), a plural possessor does trigger the plural determiner, and the singular head noun does not control the number of the determiner. In (8c), we see the same pattern: plural possessor and plural determiner with singular head noun. The number agreement facts, then, suggest that the determiner forms a constituent with the possessor, and *not* with the head noun—they suggest that the structure of Hiaki Det-Possessor-N sequences is (4a), not (4b)

So we have a contradiction: Hiaki determiners in possessed DPs agree in Case with their head N, and in number with the possessor. We could put this another way: Case on the determiner in a possessive DP, like the case on the head N, is determined by the grammatical function of the entire possessive DP. In contrast, number on the determiner is controlled by the possessor.

This raises two important questions. First, which test is indicating the true constituency? And, once we know what the true constituency facts are, how is the mismatch in agreement in Hiaki DPs negotiated? We turn these questions in the next section.

3. THEORIES OF AGREEMENT

There is considerable variation within and across theories concerning the relationship of agreement and structural case assignment, on the one hand, and on the other the independence or dependence of agreement among the different features within the phi-feature bundle which participate in agreement: person, number, gender and case.

Agreement involves a relationship between a 'trigger' or 'controller' of agreement and a 'target'. The features belong intrinsically to one particular element in the structure—in current Minimalist theory, these are the 'interpretable' features—and agreeing elements copy those 'real' features from the constituent that has those features intrinsically. The agreeing elements bear 'uninterpretable' features, which must be valued by interpretable ones. Interpretable features are designated *i*F, uninterpretable ones *uF*, in current notation. Nearly all theorists agree that the uninterpretable features must stand in a local relationship to the interpretable features which value them. Further, nearly all theorists agree

that uninterpretable features, when Merged into a structure, search downward in their c-command domain for the interpretable features that value them. This operation, called Probe, is governed by locality: Probe is satisfied by the closest element which bears the appropriate interpretable features.

Below are some dimensions of variation in current theory concerning how and when this valuation operation takes place, which we could imagine are relevant to solving the Hiaki problem:

(9) a. 'Match' requirement for deletion of uF (Chomsky 2001)
     b. Possibility of agreement with more than one head (Hiraiwa 2001)
     c. Possibility for agreement of only one value of feature (Béjar and Rezac 2009)
     d. Possibility for parametric variation in location of Probe (Béjar and Rezac 2009)
     e. Possibility of upward as well as downward Probing (Baker 2008)
     f. Possibility of restriction to functional heads (Baker 2008)
     g. Possibility of syntactic/postsyntactic contrast between A-P agreement and Concord agreement (Norris 2011)

Here we will briefly suggest a couple of hypotheses about agreement in the Hiaki DP, without delving too deeply into the theoretical realm. I leave a full exploration of the theoretical implications here for future work. The questions to be addressed are the following. First, which constituent bears the 'real' features, and which constituent is merely agreeing? Second, what is the relationship between DP structure, the features themselves, and the agreement operation such that a possessor interferes with *either* number agreement or case agreement, but not both? We conclude that it seems that the agreement operation has to be multidirectional, and involve individual features, to account for the facts of Hiaki.

3.1. Number and Case in Hiaki

In this section, we briefly consider the properties of number and case in the language, outside of the possessive DP. One possibility that will influence our analysis is that one value of either number or case is 'invisible' for a Probe from above, rendering a given N transparent for agreement purposes. This might follow if one value is marked, and the other is default; this distinction has been shown to be significant for person features by Béjar 2008 and Béjar and Rezac (2009).

Our discussion then begins by asking which of the two numbers in Hiaki is more marked: singular or plural? Nevins 2007 describes a classic markedness diagnostic from Jakobson and Greenberg which depends not on the distribution of the marked feature itself, but on its effect on other features:

> A final diagnostic for markedness is one echoed in both the work of Jakobson and Greenberg: that if a certain category is marked, then one will find less oppositions for other categories within it. For example, plural is more marked than singular, and one finds very little gender distinction in the plural in Russian, as opposed to the singular. Feminine is more marked than masculine, and one finds that English pronouns distinguish accusative from genitive case in the masculine (him vs. his), but not in the feminine (where both are her). First person is more marked than third, and one finds that no language exists in which gender distinctions are made for first person pronouns but not for third person pronouns. We will call this source of markedness evidence Marked Features imply Less Subdistinctions
> (Nevins 2007)

By this criterion, Hiaki plural is marked with respect to singular: Recall that case-marking syncretizes in Hiaki in the plural:

(10) Case syncretism in the plural

	sg	pl
nom	uu-Ø chuu'u-Ø the-nom dog-nom	ume chu'u-m The.pl dog-pl
acc	uka chuu'u-ta the.acc dog-acc	

The existence of fewer case distinctions in the plural than the singular is evidence that plural is marked with respect to singular.

This syncretism is a deep property of the system, rather than simple underspecification, because it is true of all the nominal forms, regardless of the form that realizes them: determiners (-Ø 'nom' vs. –ka 'acc'), nouns (-Ø vs. –ta 'acc'), and adjectives (-Ø 'nom' vs. –k 'acc').

Having established that within the number system, plural is marked with respect singular, let us now briefly examine the case system of Hiaki, before we consider the interaction of case assignment with case and number agreement. Overall, Hiaki case is incredibly well-behaved. The syntactic behavior of Hiaki NPs conforms to case-theoretic expectations perfectly. Objects are promoted to subject in the passive, for example, whether plural or singular:

(11)   a.   Uu pahko'ola   uka usita   hahase.
              The.nom pascola.nom the.acc child.acc   chase
              "The pascola is chasing the child."

       b.   Uu uusi   hahase-wa
              The.nom child.nom   chase-pass
              "The child is being chased."

       c.   Ume usim/Vempo/*Vempoim hahase-wa
              The.pl children/3pl.nom/*3pl.acc   chase-pass
              'The children/they/them are being chased"

       d.   *Vempo/Ume pahko'olam   ume uusim/vempoim hahase-wa
              *They/the.pl pascolas   the.children/3pl.acc   chase-pass
              "They are chasing the children/The children are being chased"

We can conclude that all Hiaki DPs, whether overtly marked for it or not, must check an abstract case feature. It appears that subject case is checked, as usual, by the TP node, and we will assume that object case is checked, also as usual, by the vP node. In passives, the vP cannot check object case, and so the object must move to TP to check subject case isntead.

3.2. The Hiaki possessive DP

To recap the problem established in section 2 above: Case on the determiner in a possessive DP, and on the head noun, is determined by the grammatical function of the entire possessive DP. The number of the determiner, in contrast, is controlled by the possessor. We wish to determine the constituency of the possessive DP, and the source and nature of the agreement operations which determine this distribution of features within it.

3.2.1. Constituency

Our first question is, what is the constituency of the Det-Poss-N sequence? Is it

(12)   a.   [[Det Poss] N]
                  D number agreement with possessor expected.
                  D case agreement with possessed N mysterious.
    b.   [Det [Poss] N]
                  D case agreement with possessed N expected.[4]
                  D number agreement with possessor mysterious.

In fact, we argue that possibility B, our original proposal is the correct one, for the following reasons. First, the case variation on D and N is 'true' to the general case—it behaves as we would expect were the possessor not present. Structure B predicts this default behavior. Second, in possessorless DPs, D gets its Number value from within the DP, and its Case value from outside the DP. Because the difference between a possessorless DP and the possessive cases considered here involves adding a possessor in a DP-internal position, as in possibility B, it is logical that this change would affect the internal structure of the DP, not its external distribution. And finally, given the argumentation above, [pl] is a marked feature in Hiaki. Introduction of additional marked features into a locality-based system is expected to disrupt the normal functioning of the system. Consequently, it would make sense that the number agreement system is disrupted by the addition of a marked-number possessor.
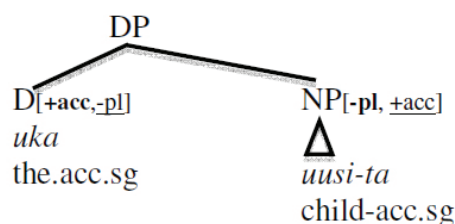
In (13) below, I outline a structural hypothesis about the system of agreement and case-checking that generates the distribution of number and case features on a basic non-possessed DP. The interpretable number feature is generated within the DP, and the interpretable Case feature is generated externally, from T or v, depending on whether the DP is in subject or object position.

(13)   Case and number in a basic Hiaki DP.
                Case is interpretable on D, and N agrees with D for Case
                Number is interpretable on N, and D agrees with N for Case.

a.   plural (in object position)   b.   singular (in object position)
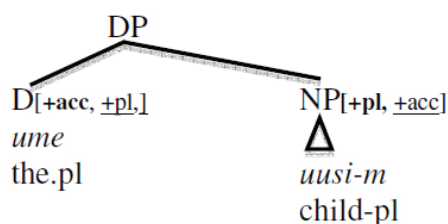
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         DP                                    DP
        /  \                                  /  \
       /    \                                /    \
  D[+acc, +pl,]    NP[+pl, +acc]       D[+acc,-pl]     NP[-pl, +acc]
   ume              △                  uka               △
   the.pl          uusi-m              the.acc.sg        uusi-ta
                   child-pl                              child-acc.sg
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4. However, as we'll see, it's hard to figure out technically how to implement this expectation with modern syntactic tools!

Note that this requires that a null determiner or other case-receiving functional projection is formally present even when there is no overt determiner, to be the host of the 'real' Case features which the head N within the DP copies.

Now, given option B, above, we can conclude that in a complex possessive DP, the Possessor inserted into the structure below D but above NP. It does not form a constituent with D. Whether it is adjoined to NP, in the Spec of NP, or in the Spec of an intervening functional projection, the possessor needs a Case assigner to value its genitive Case. I will assume a Gen inherent case-marking head which checks Case for the Possessor before it is merged into the structure, following Rezac (2008).

We also need the possessor DP to be more local to D than the NP, which also bears number features, since we know that the possessor DP intervenes between the main determiner and the head noun. This means that the possessor DP must sit in the specifier of a functional projection above NP, rather than in a projection of NP itself, otherwise the number feature of NP will be more local to D than the number of the possessor. The internal structure of a possessed Hiaki DP must then be like this:

(14) Possessive Hiaki DP with singular possessor, plural possessee, in subject position: Inherently case-marked genitive DP in specifier of an FP within DP.

"The pascola's leg rattles"
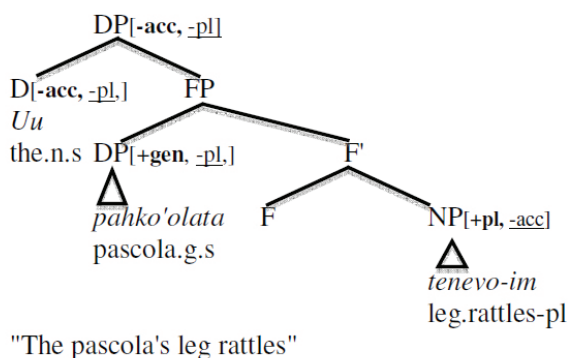
In this structure, the uninterpretable number probe on D searches downward/rightward into its sister constituent and agrees in number with the closest number-marked constituent it sees. When a Possessor DP is present, the possessor will be the target of that probe. When the Possessor is not present—in a basic DP, as in (13), the head N will be the target of that probe.

(15) Possessive Hiaki DP with plural possessor, singular possessee, in object position: Inherently case-marked genitive DP in specifier of an FP within DP.

"the soldiers' truck" (object position)
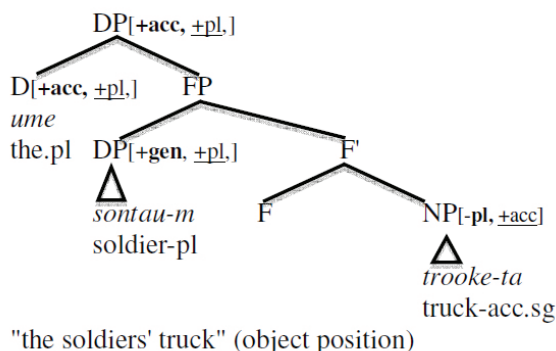
This accounts for the basic pattern. However, there is one feature-matching operation which has not been discussed in this configuration: The relationship between the D and the head N. How does the head N, with its uninterpretable case feature, value that feature against D.

It must be that N looks upward and agrees in case with the first case-marked *head* above it, or (perhaps equivalently) with the first case-marked maximal projection dominating it. There are two unusual aspects of this operation. First, it involves an *upward* probe, from the uninterpretable feature on N to the interpretable feature on D. Second, why is the left-branch genitive DP 'visible' to the D which is looking downward in the tree for a number feature, but 'invisible' to the N which is looking upward in the tree for a Case feature?

The first puzzle is perhaps not such a puzzle; it may be that uninterpretable features with no c-command domain of their own (as in the case of this head N) simply remain active through subsequent Merge operations until an element which can value them is Merged. Baker 2008 implements a similar idea— allowing matching both above and below in the search space—as part of the Earliness Principle.

The second puzzle is more difficult to resolve. There are perhaps a few different forms the solution could take. One option is that the genitive Possessor DP is just generally invisible for Case matching, since its case is lexical/inherent. Another possibility is that the upward probe on the N head is subject to a Head Movement Constraint-like restriction: it can only probe for elements of its same category above (as in Rizzi 1991's Relativized Minimality). Upward-probing heads are limited to probing for active *heads* which merge and project in their extended projection. In other words, such probes can't look for features on specifiers in left branches, like the Possessor DP, here. In contrast, downward-probing heads (like D) can probe for anything in their c-command domain. Finding a satisfactory technical implementation that captures this contrast in an intuitively plausible way, however, is not an easy task. We leave the problem here, to be revisited in future work.

4. CONCLUSION

In this short paper, I have described a conundrum posed by a simple pattern of case and number agreement in the Hiaki possessive DP. The Possessor DP appears to interrupt the locality relationship between the main determiner and the head noun with regard to number agreement, but not with regard to case agreement. In attempting to propose a formal analysis of this pattern, we are led to two major theoretical conclusions of consequence. First, upward probing by an uninterpretable feature must be possible, to account for Case concord between the head N and the main D. Second, the results of Béjar 2008 and Béjar and Rezac (2009) are confirmed, in that we see a single D head bearing features which are valued from two distinct sources. The bundle of case, person and number features, then, is not a sacrosanct whole, checked in an All or Nothing fashion, but can be selectively dissected at the discretion of a particular language, with individual features entering into Agree relations with different probes and/or targets. These two broad points aside, however, we have not found a clean technical implementation of case and agreement in any of the proposals in the literature that will make the right predictions for the Hiaki case. We propose a preliminary structure and set of Agree relations, but a full implementation and discussion of the implications for the overall system remain to be developed.

PAREAMENTO DE TRAÇOS E DISSOCIAÇÃO ENTRE CASO E NÚMERO NO HIAKI

RESUMO

Há uma grande quantidade de propostas teóricas para a implementação da operação de *cópia de traços* ou *pareamento de traços* que subjaz ao fenômeno da concordância nas línguas naturais. Um subtópico atual nessa vasta paisagem de debate teórico é se os traços em um único feixe conseguem seus valores de alvos independentes – a questão do "tudo ou nada" (BÉJAR, 2008). Nessa investigação preliminar, dados dos DPs do Hiaki ilustram um caso em que traços em um único X^o são valorados por controladores separados, e levantam problemas de localidade para teorias de concordância.

PALAVRAS-CHAVE: concordância, acordo, sonda, Hiaki, caso, número, determinante

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