A'-Binding in Hua

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1 Preliminaries

This paper concerns itself with the "anticipatory subject" phenomenon of the Papuan languages of the Eastern New Guinea Highlands. Hua will be the exemplar of these languages, and the data discussed here are drawn from John Haiman's detailed account of the language (Haiman 1980). I hope to show that exotic as this Hua data might appear at first, a version of the Binding Theory of the Government and Binding theory can shed some light on the distribution of certain morphemes in the language. In particular, I will argue in section 3 that the facts from Hua provide evidence that supports a theory of binding which constrains anaphoric relations between elements in non-argument position.

The anticipatory subject phenomenon bears a strong family resemblance to the sort of obviation found in so-called "switch--reference" (SR) systems familiar to scholars of Native American languages (see, e.g., Jacobson 1967 and the papers in Munro 1980 and Haiman and Munro 1983 in particular). In this section I will give a quick overview of SR systems in order to clear away some of the underbrush and pave the way for the discussion of Hua.

In languages with SR systems, noncoreference between the subject of an embedded clause and the subject of the clause superordinate to it is encoded by the presence of a morpheme, usually affixed to the embedded verb. A different marker, also affixed to the lower verb, signals the relation of coreference between subjects. Schematic SR examples are shown in (1), where

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SS=same-subject and DS=different-subject.

(1)   a.   After he$_i$ arrived-SS, he$_i$ ate.

      b.   After he$_i$ arrived-DS, he$_j$ ate.

      c.   *After he$_i$ arrived-SS, he$_j$ ate.

      d.   *After he$_i$ arrived-DS, he$_i$ ate.

    The examples in (2) from Mojave (from Langdon and Munro
1979) are typical of SR patterns ($\underline{k}$ = SS, $\underline{m}$ = DS).

(2)   a.   ?in^{y}ec pap ?-^kxi:e-$\underline{k}$ / ?-sal^{y}i:-k

           I potato 1-peel-SS / 1-fry-tns

           'After I peeled the potatoes, I fried them'

      b.   ?in^{y}ec pap ?-^kxi:e-$\underline{m}$ / Judy-c sal^{y}i:-k

         . I potato 1-peel-DS / Judy-subj fry-tns

           'After I peeled the potatoes, Judy fried them'

    Two things are of particular note here. First, SR-marking
redundantly appears; it is present even though there is enough
morphological information, in the form of overt NP's or agree-
ment features on the verb, to indicate that the subjects of the
relevant clauses are the same or different. Second, the
embedded subject ?in^{y}ec ('I') has a constant form in both
examples. That is, SR does not appear to affect the morpho-
logical shape of the subject NP's. It remains constant while
the verbal morphology alternates. This latter property is
especially salient in the Yavapai examples in (3) (from Kendall
1975; SS and DS as above in Mojave).[1]

(3)   a.   tokatoka-c savakyuva u-t-$\underline{k}$ / cikwar-kiñ

           tokatoka-subj savakyuva see-temporal-SS / laugh-compl

           'When Tokatoka$_i$ looked at Savakyuva$_j$, he$_i$ laughed'

b.   tokatoka-c savakyuva u-t-m / cikwar-kiñ

tokatoka-subj savakyuva see-temporal-DS / laugh-compl

'When Tokatoka$_i$ looked at Savakyuva$_j$, he$_j$ laughed'

The above examples are identical, except for the alternation of the verbal suffix. This fact indicates that the coreference relation signalled by SS has nothing to do with the category of NP that participates in this coreference relation. This is especially striking, since most of the coreference/noncoreference relations that, for example, a theory of binding would be designed to account for would be driven by a classification of nominal expressions with respect to categories [±anaphor], [±pronominal]. Even though the coreference/noncoreference relation of SR appears to be as local and obligatory as that where elements like he, himself, and John are concerned, the categories of NP do not vary in SR constructions --- Tokatoka remains constant in the examples above, regardless of whether it is coreferential or not with the upper subject.[2]

Another property of SR is that the SS and DS markers are constant across differences of person and number. As can be seen from the Yuman examples above, (2)-(3), SS and DS do not vary with the subjects. This is schematized below:

(4)   [[NP$_i$ VP AGR DS] NP$_k$ VP AGR] (i≠k)

(5) a.   [[NP[3pl] ... DSa] NP[3sg] ...]

    b.   [[NP[2pl] ... DSb] NP[3pl] ...]

    c.   [[NP[1sg] ... DSc] NP[2sg] ...]
   etc.
          where DSa=DSb=DSc...=DSk

The shape of DS and SS do not vary with respect to differences in person and number of the subjects of the switch-reference clauses. As will be seen below, the Hua data bear both similarities to and differences from the SR facts above; coreference and noncoreference between subjects are morphologically encoded, but the morphemes corresponding to SS and DS vary with the person and number of the subjects.

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2 Hua Medial Constructions

2.1 Different-Subject Medials

In the Hua constructions bearing similarities to SR constructions (known as "medial constructions"), two affixes appear sentence-finally in the subordinate clause when the subjects of the relevant clauses are different. The first affix (what Haiman terms the medial desinence) inflects for the person and number of the local subject, and the second affix (Haiman's anticipatory desinence) inflects for the person and number of the subject of the immediately superordinate clause. The different-subject medial construction is represented in (6), where [μF] and [ßF] range over combinations of person and number features. M and A are the medial and anticipatory desinences, respectively.[3]

(6)   [[NP$_i$ VP M A] NP$_k$ VP]

        [μF]   [ßF]
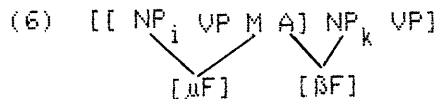
Examples of (6) from Hua include (7).[4]

(7)   a.   Fumo d-mi-sa ga da / ugue

            pork 1sg-give-FUT3pl M3pl A1sg / 1sg-go-FUT

            'They will give me pork,
            and then I will go',
            'After they give me pork, I will go'

        b.   Sodo demo bai na da / kgoe

            good man be M2sg A1sg / 1sg-see

            'You are a good man, and I see you'

c. Fumo d-mi ga ta'a / do'e

pork 1sg-give M3sg A1dl / 1dl-eat

'After he gave me pork, the two of us ate',
'He gave me pork, and the two of us ate'

d. I' ra' fri-re-ga-na / bade-'a-mo bza-mo 'a'-do-di
hurmi-bai-e

his mother die-perf3-M3sg-A3sg / boy-her-pt sweet
potato-pt neg-eat-inf walk about-prog3-fin.

'After his mother died, her son walked about without
having sweet potatoes to eat'

   As in the above different-subject SR examples, nonco-
reference between subjects is morphologically encoded, but the
morphemes signalling this difference vary with the morphological
features of the subjects. Subject-verb agreement in the dif-
ferent-subject Hua medial is fairly complex (see Haiman for
discussion), but the main feature of it is that the requisite
"identification" of the subject occurs through an interaction of
the M affix with an alternation of a vowel of the verb stem. A
chart illustrating this is given below:

(8)   stem M   A
        'do'

sg 1   hu   ga   na 'I did and he...'
   2   ha   na   na 'you did and he...'
   3   hi   ga   na 'he$_i$ did and he$_k$...'

dl 1   hu   'ga na 'we two did and he...'
   2/3 ha   'ga na 'you two did and he...'

pl 1   hu   na   na 'we did and he...'
   2/3 ha   ga   na 'you all did and he...'

   Note that neither the shape of the affix nor the
particular stem vowel is sufficient by itself to fully indentify
the subject. On the basis of this I will assume that the M
affix constitutes part of the Hua AGR(eement) complex, and it is
the combination of the affix and the vocalism of the verb stem
that is the fully constituted AGR. One consequence of this as-
sumption is that the rule that coindexes [NP,S] with AGR (cf.

Chomsky 1981) will also have the effect of coindexing the subject of the clause with M̱ and thus ensuring that the two share agreement features (this coindexing will be exploited below).

Given the further fact that there is the same sort of agreement between the Ā affix and the upper subject, I will assume that there is coindexing and consequent feature-sharing in this case as well (I will postpone discussion of the mechanism that guarantees this coindexing until later).

Haiman takes the Ā affix to be the marker of this sort of medial construction, and further argues that it is adjoined to the left of the clausal constituent. In our terms, Haiman's assumptions can be implemented by taking Ā to be a sort of complementizer, hanging to the right of S under S' (I assume here that COMP is the head of S' and that Hua is essentially right-headed). Putting the above assumptions concerning constituency and coindexing together, we arrive at the following structure for the different-subject Hua medial (irrelevant details omitted).

(9)
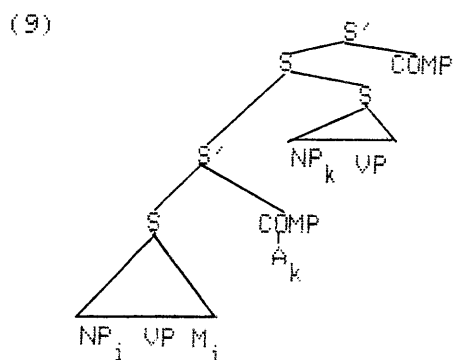
2.2 Same-Subject Medials

The Hua same-subject medials bear more of a resemblance to the earlier switch-reference examples, in that only one of the two affixes is present. Only Ā occurs in the examples in (10), and it shares morphological features with both subjects.

(10) a. "vede bau-e" hu-to-ka / kai-di bro-o

      human be-1sg say-if-A2sg /
      skirt-1sg+poss put-imp

      'If you claim to be human,
      put on my skirt'

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b. ri fi'a-ro bro-ro-'da /
   igari' fera na ko-e

   firewood rack-loc put-perf-A1sg /
   spider big thing see+1sg-fin

   'I put some firewood on the rack,
   and I saw a big spider'

c. "zga do-ku-e" hu-ko-to-'da /
   ru'a d-keta ha-vi ro-'da / bro-e

   possum eat-FUT1-fin say-lim.dur-?-A1sg /
   other 1sg+poss-mind hear-PERF-?-A1sg /
   put+1sg-fin

   'I thought of eating possum for awhile,
   but then I changed my mind'

d. inapu bade bai-to-na / kigi a'-hu-ro-hi

   infant boy be-when-A3sg /
   laugh neg-do-habitual

   'When he was a boy, he didn't laugh'

In addition, the sentence fragments in (11) demonstrate that M and A cannot coexist in the same-subject medial.

(11) a. *hu-ga-da...   b. *ha-na-ka   c. *hi-ga-na

        do-M1sg-A1sg   do-M2sg-A2sg   do-M3sg-A3sg

'I did and I...' 'You did and you...' 'He$_i$ did and he$_i$...'

The facts so far are the following: In the different-subject constructions, both A and M cooccur; M agrees with the subject of its clause, and A agrees with the subject of the superordinate clause. In the same-subject constructions, only A occurs, and M is precluded. [5] There are at least two questions to be answered: What forces the coindexing/agreement between A and the upper subject (this is leftover from the earlier section), and why can M not cooccur with A in the same-subject constructions? These questions will be addressed in the next section.

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3 The Role of the Binding Theory

In Finer 1984, 1985, it is argued that SR patterns like those in (2)-(3) admit of an analysis in terms of Principles A and B of a generalized Binding Theory (as in, e.g., Aoun 1981), and I will suggest that an analysis of the Hua constructions can proceed along the same lines. In the SR analysis, SS and DS are generated in COMP, and they become coindexed with the lower subject through a generalization of the rule coindexing [NP,S] with AGR. SS, the same-subject SR marker, is analyzed as an anaphor with respect to the upper agreement element, and DS, the different-subject marker, is analysed as a pronominal with respect to the same element. Given Belletti and Rizzi's (1981) notion of head-to-head government and a version of c-command that allows the upper AGR to c-command the lower COMP, the SR facts follow. DS (an A'-pronominal), coindexed with the lower subject, cannot be bound by the upper AGR (coindexed with the upper subject), and SS (an A'-anaphor) must be bound by the upper AGR, which in turn is coindexed with the upper subject.

Now to the Hua. Recall that the agreement between the lower subject and M was accounted for as a reflex of subject--verb agreement; this account will not generalize to cover the agreement between A and the upper subject, however, since these elements are in separate clauses. Morphological agreement does occur in another context, however: it shows up when there is a binding link between elements that carry morphological features.[6] That is, given that X binds Y, X and Y share agreement features when agreement features are part of the morphological matrices of X and Y.

In order to account for this agreement between A and the upper subject, I will assume that this Hua affix is the formal analogue of the same-subject marker of SR languages, an A'--anaphor lodged in COMP and bound by the AGR of the upper clause. What differentiates A from SS is that the former carries agreement features and occurs in different-subject constructions. When this binding occurs, identity of agreement features is ensured.

In the previous section, it was noted that A and M cannot cooccur in the same-subject medial. This, I suggest, is due to the pronominal status of the Hua AGR element --- M is an A'--pronominal. By Principle B of the Binding Theory, it must be free of A'-binders in its governing category.

Summarizing at this point, $\underline{A}$ is an A'-anaphor, falling under Principle A, and $\underline{M}$ is an A'-pronominal, subject to Principle B. Agreement between $\underline{M}$ and the subject of the lower clause is part of the general subject-verb agreement process, and the agreement between $\underline{A}$ and the subject of the upper clause arises by the binding relation between $\underline{A}$ and the upper AGR, which in its turn agrees with the upper subject. Now consider the structures below.
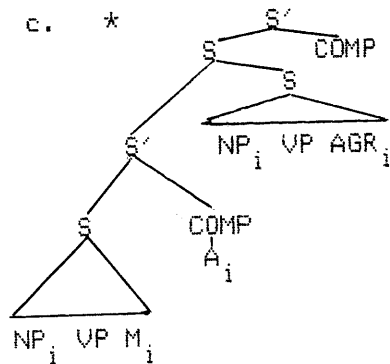
(12)   a.
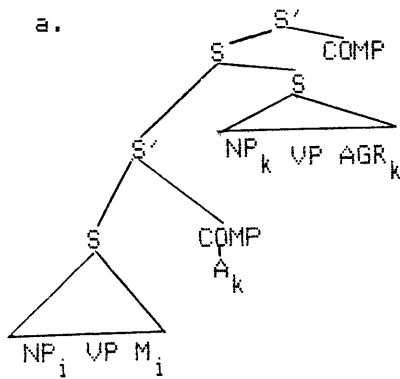
b.
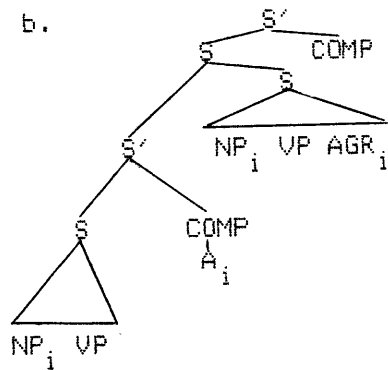
c.   *

(12a) is the different-subject medial from section 2.1. Here A is governed by AGR, [7] and AGR is the SUBJECT accessible to A. The governing category for A is thus the matrix clause, and A is A'-bound by the upper AGR element. The situation is identical in (12b).

M is A'-free in (12a). It is, of course, coindexed with and c-commanded by [NP,S], but this latter category is in an argument position, and we are only concerned with A'-elements here. Consider now (12c). Here, as above, A is A'-bound, and Principle A is satisfied. M, however, is bound by A, and this should result in a violation of Principle B. Taking M as the head of the lower S, we find that is governed from COMP by A. As far as a SUBJECT accessible to M goes, there are at least two options, both of which have the effect of yielding the subordinate S' as the governing category for M. We could assume, for instance, that when the SUBJECT is AGR (as it essentially is in this case) and when AGR needs an accessible SUBJECT, its clausemate [NP,S] can serve as SUBJECT. Alternately, we could follow Huang (1983) and assume that there need only be a SUBJECT in the governing category of a pronominal, it need not be accessible. In this case, M is its own SUBJECT.[8] In either case, (12c) exhibits a violation of Principle B; M is bound in its governing category, and examples like (11) are correctly ruled out.

4 Conclusion

This brief discussion of certain facts from Hua supports Aoun's (1981) generalization of the Binding Theory to include anaphoric relations between elements in A'-position, and although Aoun only considers A'-anaphors, the above analysis shows that Principle B is active in the A'-wing of the Binding Theory as well. In addition, the fact that A displays agreement with the upper subject indirectly supports the treatment of switch-reference offered in Finer 1984, 1985 where the same--subject marker SS is analyzed as an A'-anaphor (although SS does not show agreement with its binder).

In conclusion, a very interesting, if not surprising, array of facts can be seen to fall into the empirical scope of the Government and Binding Theory. Data like this from Hua can serve as a rich testing ground for theories of coreference and agreement coming from anywhere in syntactic theory.[9]

NOTES

1. From Kendall's discussion it is clear that the direct object of the lower clause is coreferential with the upper subject in (3b), but this need not be so; SR is strictly a subject-to--subject relation in its canonical form.

2. See Finer 1985 for further discussion of SR with respect to the Binding theory.

3. Haiman discusses two medial constructions, what he calls the "subordinate" and "coordinate". It is the "coordinate" medial that is under discussion here, although I am assuming (along with Haiman, in fact) that the clauselike adjunct is subordinate at S-structure (Haiman has a coordinate structure at Deep Structure, and proposes a set of transformations that have the effect of tucking one conjunct in under the other).

4. Two things are of particular note in these examples. First, in (7c), 'he' and 'we two' are disjoint in reference, not simply noncoreferential, and what we appear to have in (7d) is a case of referential circularity (cf. Higginbotham 1983, where such constructions are ruled out as a matter of principle). Haiman terms the latter a "Janus construction."

5. It is unclear at this point whether A is agreeing with the top subject, as in the different-subject medial, or with the bottom subject, but Haiman shows that the latter agreement pattern holds, and Finer 1984 suggests, adapting a remark of Haiman's, that A agrees with the lower subject for purposes of identification of that subject since M cannot occur in the same--subject construction.

6. The cases I have in mind are familiar ones like John likes himself / *themselves / *herself, etc.

7. Assuming head-to-head government, and that Infl/AGR is the head of S.

8. The former option is taken in Finer 1984 for both pronominals and anaphors, not only in the analysis of Hua, but also in the analysis of Yuman relative clauses.

9. There is more to the Hua story, but space limitations preclude a full discussion. In particular, when there is "inclusive reference" between the two subjects (as between 'we' and 'I'), there are two forms that the construction can take. The first is similar to the same-subject medial in that only the A affix appears, but it inflects for the person and number of the lower subject (see note 5 above). In the second form, M appears, agreeing with the local subject, but A appears to inflect for the "leftover" morphology of the upper subject. That is, in the Hua counterpart of 'When I got home, we two ate', M is first-singular, and A is third-singular ('we two' minus 'I' equals 'he'). This fact presumably derives from a disjoint reference condition on M and A plus some pressure from somewhere for A to agree with as much of the upper subject as it can. See Haiman 1980 and Finer 1984 for more discussion and analysis.

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