In this article I discuss facts of switch-reference (SR)\(^1\) and their relevance to the theory of grammar. Although it might be argued that SR has its ultimate explanation in functional terms, I hope to show that the SR patterns below are inescapably syntactic, obeying certain locality conditions that can be taken as diagnostic of the operation of the binding theory of the Government-Binding theory (Chomsky (1981; 1982)). I argue that although the analysis of SR phenomena cannot be stated in terms of binding principles that are relevant only to argument positions, the facts can be accounted for once it is assumed, following Aoun (1981; 1982; forthcoming), that there are anaphoric relations between nonargument positions. The following analysis of SR phenomena therefore provides a further articulation of the logical space of the binding theory. As a consequence, this prima facie exotic set of facts falls into line with more familiar exemplifications of Universal Grammar.

1. Switch-Reference Patterns

1.1. Biclausal Switch-Reference

In languages such as English, sentences like (1a–c) are ambiguous; they admit of interpretations in which the subjects of the two clauses are either coreferential or non-coreferential.

(1) a. Before he left, he visited Tucson.  
   b. Before Bill left, he visited Tucson.  
   c. Before he left, Bill visited Tucson.

This fact follows naturally from the binding theory of Chomsky (1981). That is, under

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1 Languages exhibiting SR effects are a geographically and genetically diverse lot. The facts discussed here are drawn largely from Native American languages of Hokan stock.
the assumption that the adverbial clause before NP left is adjoined to the left of the matrix S, there is no c-command between the subject positions of the two clauses in the above examples. Since c-command and coindexing are necessary and sufficient conditions for binding, one NP therefore cannot bind another in the other clause. According to principle (C) of the binding theory, an R-expression (Bill in the case of (1b–c)) must be free (unbound) in all domains, and in examples (1b–c) Bill is free, even though it may be coindexed with the subject of the other clause. Because c-command fails to obtain, then, coindexing is free, and the pronouns and names in (1) may corefer or not at will with no violation of the binding principles.

In languages with so-called switch-reference systems, however, the coreference possibilities for NPs in examples corresponding to (1) are not free, although the structural configuration of the sentences analogous to (1) is, as far as I can tell, identical to that of the above examples. William Jacobsen, who coined the term switch-reference, characterizes the phenomenon as follows: "It consists simply in the fact that a switch in subject or agent . . . is obligatorily indicated in certain situations by a morpheme, usually suffixed, which may or may not carry other meanings in addition" (1967, 240).

The morpheme of which Jacobsen writes is found in a subordinate clause (usually some sort of adverbial clause) and is suffixed to the verb. Many languages with SR systems have two such morphemes, one to signal that the subjects are the same and another to signal that the two are different. Thus, when the same-subject marker (SS) is present, the two subjects in question are coreferential, and when the different-subject marker (DS) is present, the two subjects are noncoreferential. Example (1a) can be schematically recast as in (2), where the roles played by SS and DS are indicated by indices on the subject NPs.

(2) a. Before he₁ left-SS, he₁ visited Tucson.
   b. Before he₁ left-DS, he₁ visited Tucson.
   c. *Before he₁ left-SS, he₁ visited Tucson.
   d. *Before he₁ left-DS, he₁ visited Tucson.

Instantiations of the patterns in (2) from Mojave (Langdon and Munro (1979)) are shown in (3), where -k = SS and -m = DS.² In all examples to follow, the morphemes corresponding to SS and DS are italicized.³

(3) a. nya-isvar-k / i:ma-k
   when-sing-SS / dance-tns
   'When he₁ sang, he₁ danced.'

² As the reader will no doubt notice, in the Yuman examples from Mojave, Diegueño, Tolkapaya, and Yavapai, the morphemes corresponding to SS and DS have phonologically identical counterparts that are glossed as tense or case-marking affixes. This apparent homophony has been a recurrent topic of investigation among Yumanists. See for discussion Redden (1966), Langdon (1970), Kendall (1975b), and Munro (1976). I have nothing new to add to the discussion, so clear cases of SR will be analyzed as involving SS and DS, and other instances of the k/m opposition will not be.

³ I have reproduced the glosses from the sources indicated. Some of them are very explicit; others are not.
b. nya-isvar-m / i:ma-k
   when-sing-DS / dance-tns
   ‘When hei, sang, hei danced.’

Data from Washo (Jacobsen (1967)) and Seri (Moser (1978)) also exhibit SR.4

(4) Washo
   a. ?ip’amida / bemu:c’ukgaña?i
      he-got-there-SS / he-started-to-doctor
      ‘When hei, got there, hei started to doctor.’
   b. guk’ugat’umuwe?išda / ga:gila gedumbec’edi
      he-was-stooping-over-going-in-DS / in-his-testicles-he-poked-him
      ‘As hei, was going in stooping over, hei poked him in his testicles.’

(5) Seri
   a. t-ooxxi / i?meemt
      DP-die-(SS) / [perf-stink]
      ‘When iti, died, iti stank.’
   b. i-t-a?t ma / m-oxxookam
      [3-obj]-DP-[see-pl] DS / perf-[flee-pl]
      ‘When theyi, saw themj, theyj fled.’

Likewise, sentences analogous to (1b–c) are attested in other SR languages. Consider the following Yavapai examples from Kendall (1975a).

(6) a. tokatoka-č savakyuva u-t-k / čikwar-kiň
      Tokatoka-subj Savakyuva see-temporal-SS / laugh-compl
      ‘When Tokatoka, looked at Savakyuva, hei, laughed.’
   b. tokatoka-č savakyuva u-t-m / čikwar-kiň
      Tokatoka-subj Savakyuva see-temporal-DS / laugh-compl
      ‘When Tokatoka, looked at Savakyuva, hei, laughed.’

Since all the examples given so far involve third-person subjects, a reasonable first hypothesis would be that the SR mechanism is simply an optional device to avoid ambiguity. That is, when ambiguity threatens, speakers of SR languages invoke SS or DS, whereas speakers of English, for example, must rely on the context of utterance or other extralinguistic cues. But in fact, even when the information supplied by person- and number-marking on the verb is sufficient to ward off potential ambiguity, SS and DS

4 There is no overt same-subject marker in Seri, and according to Jacobsen, Washo has a series of same-subject markers as well as different-subject markers. Langdon and Munro (1979), however, claim that Washo has no same-subject marker. Given the analysis to be proposed below, I am forced to side with Langdon and Munro, since Jacobsen cites examples from Washo that appear to show same-subject-marking across discourse. Thus, if Jacobsen is right that Washo has a same-subject marker, this would pose serious problems to the proposals in section 2. If Langdon and Munro are correct, there is no problem. Aside from the theory-internal fact that only one position accords with the analysis of SR that I offer, I am unable to determine what could count as evidence either way to decide the question. In the Washo examples to follow, I will indicate same-subject-marking according to Jacobsen, but this is mainly for expository clarity.
are present. Likewise, SS and DS redundantly appear when nonpronominal lexical NPs occupy the subject positions of the relevant clauses. This is illustrated by data from Mojave (7), Diegueño (8) (Langdon and Munro (1979)), and Seri (9) (Moser (1978)).

(7) a. ?in'vëč pap ?-ëkxi:e-k / ?-sal'ë:-k
   I potato 1-peel-SS / 1-fry-tns
   'After I peeled the potatoes, I fried them.'

b. ?in'vëč pap ?-ëkxi:e-m / Judy-č sal'ë:-k
   I potato 1-peel-DS / Judy-subj fry-tns
   'After I peeled the potatoes, Judy fried them.'

(8) ?i:k"i:və-č nakamič-m / ?ə-taly-č tu:pa
    men-dem-subj return = pl-DS / 1-mother-subj crack = acorns
    'When the men came back, my mother cracked acorns.'

(9) t-ooxxii ma / ?immoo ?a-y-sałaxk
    DP-die DS / far [1 subj-pl]-past-throw
    'When it, died, we, threw it, out.'

If SR were simply a disambiguation device, then we would not expect SS and DS to appear redundantly in the above examples, since the morphological agreement features on the verb or the overt lexical NPs would provide enough information for a conversational partner to infer the correct referential relation between the subject NPs. SS and DS do appear in these cases, however, and this fact casts doubt on the claim that SR is simply a process to make things easier on the listener.

Another hypothesis that might be entertained is that DS serves to warn the listener that a new discourse entity or topic (denoted by a grammatical subject) is about to enter the conversation. Conversely, SS indicates that the discourse entity referred to by the grammatical subject of one clause is about to enter another context of predication. Under this view, SR would serve not as a disambiguation device, but as a processing aid. SS and DS would instruct the listener how to next manipulate the discourse representation.

If all of this were true, then we would expect, in the unmarked case, that SR clauses indicating retention or switch of subject would precede the clauses that contain the subjects that are retained or switched to. The data, however, do not bear out this prediction. Examples from Eastern Pomo (McLendon (1975)) in which the SR clause follows the main clause are given in (10), and examples from the Australian language Diyari (Austin (1981)) with the same property are given in (11).

(10) a. šaaqaxdayawal xa šoollayowal / waaduukeele
    quail-young-lady hearsay eastward-to / own-brother-obj
    maaduuxac'al l'ha šaak'aiqan
    indef-3 kill-DS
    'Young lady quail went eastward because/after they killed her brother.'

b. mit' saari k'iiibuhi / wi kaan' biitebiitenbaya
    she basket coil / me words chat-SS
    'She was making a basket while she was talking to me.'
(11) a. nawu pali-na wara-yi / muṇta ṇama-nandu
   3sgnFS die-part aux-pres / sick  sit-SEQ:SS
   ‘He died after being sick.’

b. ṇali nina manka-manka-yi / mata nawu pali-niyura
   1DLexclSA 3sgnFO REDUP-find-PRES / already 3sfnFS die-SEQ:DS
   ‘We find him after he had already died.’

Perhaps more to the point is the following sentence from Tolkapaya (Hardy and Gordon (1980)) that illustrates apparent topicalization of NP across an SR clause (Hardy and Gordon refer to (12) as a “center-embedded construction”).

(12) Pam-č [nya-č 'swar-t-m] ima-k yu-m
    Pam-subj [I-subj 1-sing-tem-DS] dance-SS be-Inc
    ‘While I sang, Pam danced.’

If SR were governed by purely pragmatic considerations, then we would expect the same-subject or different-subject markers to appear on the first clause, regardless of which clause is subordinate to which. Or, if the appearance of the SR markers is limited to subordinate clauses, then we would expect pragmatic principles to prevent adverbial clauses from being moved around and NPs from being topicalized across an SR clause. After all, adverbials are moved and NPs are topicalized for a pragmatic or stylistic effect, and it would be odd if the various pragmatic devices did not work in unison.

A further piece of evidence against a pragmatically based account of SR is that SR-marking across conjoined clauses appears to be fairly rare, if it does in fact exist. In the following examples from Seri (Moser (1978)), Xo is a coordinating conjunction. Note that the different-subject markers ta and ma do not appear, although the subjects of the coordinated clauses are different.

(13) a. [yoo-fp] Xo [2-yo-m-a?2o]
    [past-arrive] but [1subj-past-neg-see]
    ‘He arrived, but I didn’t see him.’

b. [pak ?aXXox im-askam-i?a] Xo [pak ?aXXox k-askam-i?a]
   [some shore neg-enter-pl TM] but [some shore nom-enter-pl-TM]
   ‘Some didn’t come to the shore, but others did come to the shore.’

Similarly, SR-marking does not occur across the coordinating conjunction ya in Diyari (Austin (1980)).

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5 Haiman (1980; 1983) and Comrie (1983) advance the claim that SR does operate in coordinate structures, and Munro (1983) cites examples from Chickasaw that appear to support the position that SR does operate across coordination, although she expresses some doubt in a footnote about the coordinate nature of the examples. See chapter 4 of Finer (1984) for discussion of Haiman’s data from Hua, and chapter 5 for more general discussion of SR in complementation and coordination. In many of the languages under discussion, it is quite unclear whether coordination or subordination is the operative structure (hence the alternation in the glosses). For present purposes, I will follow Gorbet (1976), who claims that SR clauses are in fact subordinate, but “loosely” so.
SR-marking thus appears to be a property primarily of embedded constructions; there seem to be few clear cases of SR occurring between coordinate clauses. If it is true that SR mediates only between subordinate clauses and not between coordinate clauses in a given language, then if a coordinate structure is subordinated to another clause, we should expect SR-marking to occur in somewhat of an “across-the-board” (ATB) manner. That is, SS or DS should be able to occur in each conjunct (unlike in the examples above), where the occurrence of SS or DS in each clause is governed by the coreference relation between the subject of that clause and the subject of the higher clause. In this view, SR-marking should operate in conjoined subordinate clauses from main to subordinate clause, and not across conjunction (vertically, not horizontally). SR would encode sameness or difference of subjects independently for each conjunct. It is only by virtue of being embedded that SS or DS would occur in coordinate structures.6 The following example from Diyari (Austin (1980)) fulfills this expectation.

(15) yunda warkamanda-ya niŋki-wa pita-ni / [wata kanta
2sgA tie up-PAST here-DIST-LOC tree = LOC / [not grass-ABS
tayi-nantu] ya [wata ŋapa tapa-nantu]
eat-IMPL:DS] and [not water-ABS drink-IMPL:DS]
‘You tie (the horses) up over there by the tree so they don’t eat grass and
don’t drink water.’

Note further in the above example that the subjects of the coordinated clauses are coreferential, yet the conjuncts both carry different-subject markers. If SR were determined solely on a linear basis, we would expect the second clause of the coordination to contain SS, since its subject is identical to the subject of the preceding clause. Alternatively, we might expect that the first clause of the coordination would be marked with SS, since the following clause has the same subject. The example clearly indicates, however, that SR-marking (at least in Diyari) is a function of subordination and not linear order (see the next section for more discussion).

A further consideration that weighs against a pragmatically based account is that

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6 Austin (1980) notes that examples of ATB SR-marking (see (15)) are normally all same-subject or all different-subject constructions, which accords well with the sort of parallelism found in most other ATB phenomena. See Gordon (1983), however, for examples of ATB SR from Maricopa that violate this sort of parallelism.
SR makes reference only to subjects. There appear to be no SR languages that signal coreference or noncoreference between objects of adjacent clauses or between the subject of one clause and the object of another.\(^7\) This occurs even when a nonsubject may have a higher discourse "prominence" than a subject, or when it is contrasted with a subject. Thus, even though the subordinate object is coreferential with the upper subject in the Seri example (5b) and in the Yavapai example (6b), the SR-marking is the same as it would be if the direct object were either different or absent. The question for any analysis of SR is "Why subjects?"

In brief, then, SR is not just an ambiguity-avoidance device, given that SS and DS appear redundantly. Nor is it only a discourse or pragmatic phenomenon, given that SR clauses may occur following the main clause and given that preposed elements may precede an SR clause. The failure of SR-marking to occur in conjoined structures is further evidence against a pragmatic account. Finally, SR crucially involves subjects that may well not be "topics."

We have seen that SR-marking appears regardless of what pragmatic principles it may violate; it is beginning to look more syntactic than it may have at the outset. One property of syntactic binding (of which, I will later argue, SR is a special case) is that NPs are obligatorily coreferential or noncoreferential in certain domains, and the patterns found above illustrate the obligatory nature of SR that Jacobsen notes. In a sense, this situation is reminiscent of transclausal bound anaphora and disjoint reference in English:

(16) a. John\(_i\) believes himself\(_i\) to be Napoleon.
    b. John\(_i\) believes him\(_j\) to be Napoleon.
    c. *John\(_i\) believes himself\(_j\) to be Napoleon.
    d. *John\(_i\) believes him\(_i\) to be Napoleon.

These English facts are accounted for by the binding theory. The verb believe conditions exceptional S'-deletion, and this has the effect of making the matrix clause the governing category for the anaphor himself and the pronominal him. Principles (A) and (B) of the binding theory then ensure that the anaphor is bound and the pronoun is free in their respective governing categories.

Two factors militate against a treatment of (3)–(12) parallel to the analysis of (16), however. First, the subjects of the embedded clauses in (3)–(12) are straight pronouns or lexical NPs, not anaphors. As such, they are subject to principle (B) or principle (C) and cannot be bound in their governing categories. This contrasts with the requirement that anaphors must be bound in their governing categories. Second, even if there were an anaphor/pronominal distinction to exploit in (3)–(12), there is no c-command between the two subjects, so the whole question of binding obtaining between two coindexed

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\(^7\) An exception to this generalization comes from a dialect of Yup'ik Eskimo discussed in Payne (1980) where there is a verbal suffix that appears to signal coreferentiality between a higher subject and a lower object. See discussion surrounding (32). There is also a separate suffix that indicates coreferentiality between subjects, but neither of the two suffixes appears to do double duty, establishing a subject-subject link as well as a subject-object link.
NPs is irrelevant. That is, there is no principle of grammar so far that forces coindexing of the two subject NPs where $SS$ is present, and there is nothing to prevent coindexing where $DS$ is present. The situation here is identical to that of the English examples in (1); the subject NPs may corefer or not with no violation of the binding principles. The data in (3)–(12), however, are just the sort of data that it seems some version of the binding theory should account for.

1.2. Progressive Switch-Reference

Besides the obligatory coreference or noncoreference that $SS$ and $DS$ enforce (or redundantly specify), there is another consideration that favors a binding approach to SR. Specifically, SR obeys a certain locality constraint in structures containing more than one SR-marked clause. In a multi-tiered structure, for instance, where a subject that is noncoreferential with two coreferential subjects occupies an intermediate subject position, there is different-subject-marking in both embedded clauses, even though the most deeply embedded subject is coreferential with a higher subject.

SR-marking is thus determined only with respect to two adjacent clauses at a time, as the following Seri example shows (from Moser (1978)).

(17) taaX iti t-ap $ma$ / yaX kix an i-t-atni
    there on DP-stand $DS$ / belly pos in [3-obj]-DP-hit
    $ma$ / ik-attaaX i-t-k"aa
    / ta $ak$ iti
    $DS$ / inf-go [3-obj]-DP-[neg-know] / there spec in
    t-ap $ma$ / k"a-mi-škam
    DP-stand $DS$ / [3-ref] [1-subj-pl]-perf-[arrive-pl]
    ‘When it$_i$ stood there, after he hit it$_i$ in the belly, it$_i$ could not move, it$_i$ stood over in that place, we arrived to where it$_i$ was.’

Even though all occurrences of ‘it’ are coreferential in this example, there is different-subject-marking between the first and second clauses and between the second and third. This is because ‘he’ intervenes as the subject of the second clause, and SR-marking is only determined pairwise between hierarchically adjacent clauses.

Another such example comes from Washo (Jacobsen (1967)). (The first word of the example is composed of the morpheme $\?$, a sentence-pronominalizing particle, and the different-subject marker. I have translated $\?a\?s$ as an absolutive adjunct.)

(18) $\?a\?s$ / tugay\?lela\?s
    —$DS$ / he-looked-away-for-a-moment-$DS$ / he-busted-his-bones
    geši:lemihayi
    ‘With him, doing so, when he, looked away for a moment, he, busted his, bones.’

Here $\?a\?s$ is a pronominal element standing for a sentence earlier in the discourse. The subject of this sentence is noncoreferential with the subject of the embedded clause ‘he looked away for a moment’, and therefore different-subject-marking is necessary to signal the change of subject. In the next clause, $DS$ signals that a new subject is coming
up (which happens to be identical to the subject of the first clause). There are of course examples where a subject is retained across a clause boundary. Here same-subject-marking is required until a subject change occurs, as in the following Washo example.

porcupine take-SS-therewith / scare-him DS / he’ll tell you
‘Take a porcupine, scare him (with it), he’ll tell you.’

And here is a near-minimal pair from Yavapai (Kendall (1975a)):

(20) a. m-čirav-k / kʷe-qalye-m m-tismač-m / m-sal-ñu 2-kʷiðkiñ
2-[be sick]-SS / thing-bad-M 2-dream-DS / 2-hand 1-hold
‘When you were sick and dreaming of bad things, I held your hands.’
b. m-čirav-k / kʷe-qalye-m m-tismač-k / ?-sal n-kʷiðkiñ
2-[be sick]-SS / thing-bad-M 2-dream-SS / 1-hand 2-hold
‘When you were sick and dreaming of bad things, you held my hands.’

The examples in this subsection all illustrate the locality feature of SR, and, as is well known, locality conditions are part and parcel of the binding theory. This is shown in more familiar examples like (21):

(21) a. *John believes Mary to like himself.
  b. John believes Mary to like herself.

In (21a) the reflexive anaphor is too far away to be bound by the NP antecedent agreeing in number and gender, but in (21b) the anaphor is close enough to be bound.9

These two properties of SR, obligatory coreference or noncoreference and locality, are suggestive enough of the sorts of facts accounted for by the binding theory to warrant further analysis along these lines, even though, as noted before, there is no obvious c-command relation to exploit in the SR cases. And once again, there is no obvious anaphor/pronominal distinction to invoke that would enforce anything like obligatory coreference or obligatory noncoreference. The phenomenon appears to involve the binding theory, but given these considerations, it apparently cannot be accounted for by the standard version of the binding theory that relates argument positions (A-positions).

Note, however, that these considerations are relevant only if we are concerned with establishing a direct binding link between subject NPs. Perhaps, by restricting our at-

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8 Kendall takes the -m of kʷe-qalye-m ‘bad things’ to be the different-subject marker and analyzes the phrase as a partitive, claiming elsewhere that the partitive displays SR-marking. This may be another case, however, of the Yuman k/m problem (see footnote 2). Specifically, -m can also appear as a case marker indicating comitative, and it is possible that the -m here is performing this function in an extended sense, i.e. ‘dreaming with bad things’. In any case, even if this is, as Kendall argues, an SR clause, it will, as she notes, be internal to VP and will be marked for SR only with respect to the subject of the clause containing this VP. Progressive SR-marking of the first clause (‘when you were sick’) proceeds with respect to the subject of ‘dream’ and skips the clause in object position. The SR-marking of each of these clauses is dependent upon the subject of ‘dream’; one is not dependent on the other.

9 The grammars of Japanese (Kuno (1973)), Icelandic (Thráinsson (1980)), etc., however, all allow a reflexive element in object position to be bound by a subject in a higher clause.
tension to NPs in A-position, we are leading ourselves astray; a more profitable approach might be to focus on SS and DS themselves and the sorts of syntactic configurations in which they occur. By departing from the binding theory of Chomsky (1981; 1982), which involves A-positions exclusively, we may be able to establish an indirect binding link between the two subject positions of clauses mediated by SS and DS.

I will argue in the next section that an anaphor/pronominal distinction involving A-positions (nonargument positions) can be maintained and that the c-command configuration necessary for the binding theory to apply is available at S-structure. Another effect of the proposal is that the governing category of the anaphor or pronominal is the clause immediately superordinate to that containing the anaphor or pronominal. Given these three factors, the SR data surveyed so far will be seen to fall under a generalized version of the binding theory, and the relation between SR and examples (16) and (21) will become transparent. The subject orientation of SR will also be accounted for as a consequence of the A-binding hypothesis.

2. The A-Binding System and SS/DS

In the preceding section, I pointed out that the SR data display two properties that are diagnostic of the workings of the binding principles: obligatory coreference or non-coreference and locality. I also pointed out that the structure that may be most plausibly assigned to the examples is not immediately compatible with the claim that the binding theory is active. To summarize briefly, the structure assumed is something like the following.\(^\text{10}\)

\[
\begin{aligned}
& S' \\
& \quad \downarrow \quad \text{Comp} \\
& S \\
& \quad \downarrow \quad \text{Comp} \\
& S' \quad S \quad S \\
& \quad \downarrow \quad \text{Comp} \quad \text{NP} \quad \text{VP} \quad \text{Agr} \\
& \quad \downarrow \quad \text{NP} \quad \text{VP} \quad \text{Agr}
\end{aligned}
\]

Given that an R-expression like John or Tokatoka can occupy subject position in the lower clause and be coindexed with the NP in subject position of the matrix clause

\(^{10}\) For the moment, I am providing a VP node for these languages. It may well be that some or all of them are best analyzed as "nonconfigurational" (that is, lacking at least a VP), but so far as I can tell, nothing crucial to the following analysis of SR depends on the presence of VP. Also, because of the SOV nature of the languages under discussion, I am attaching the Comp node to the right of S under S'.

in a structure like (22), there can be no c-command between these two positions.\(^{11}\) If there were c-command between these two coindexed positions, a violation of principle (C) of the binding theory would arise; R-expressions (e.g. John, Tokatoka) must be free in all categories.

As far as the binding theory is concerned, then, coreference or noncoreference between these positions is completely free. We have seen, however, that SS signals coreference between subjects and that DS signals noncoreference. It will be the point of this section to argue that the apparent effects of the binding theory can be captured, although the structural relation between the subject NPs rules them hors de combat. Their coreference possibilities will be accounted for indirectly, mediated by SS or DS, which will themselves be endowed with anaphoric and pronominal properties.

Regardless of the structural position of SS or DS, it is clear that these markers occupy an \(\dot{A}\)-position (nonargument position). A-positions, recall, are NP-positions that are provided by the phrase structure component of the grammar and correspond intuitively to positions that bear a grammatical function: subject of, object of, etc. They are also the locus of case-assignment and assignment of thematic role, and in general fall under the (Extended) Projection Principle. Such positions are not necessarily assigned case or thematic roles (viz. passive and raising constructions), but when such features are assigned, they are assigned to elements in A-position. The SS and DS morphemes occupy no such position; they appear as suffixes on the verb at PF and furthermore do not bind any empty categories in A-positions (see the earlier SR examples that exhibit a full complement of lexical NPs in A-position).

If SS and DS are to participate in the binding system, as suggested above, then the binding principles relevant to these elements must be such that they relate \(\dot{A}\)-positions. I propose below that SS and DS do in fact fall under such a binding theory: SS is an \(\dot{A}\)-anaphor and DS is an \(\dot{A}\)-pronominal. In addition, I suggest later in this section that SR effects illustrated in the previous section arise through a conspiracy between two linguistic relations: (i) the relation of [NP,S] to Agr(eement) (represented syntactically by coindexing) and (ii) the relation of antecedent to anaphor (also represented syntactically by coindexing). The first provides the mechanism to relate the subject of a clause

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\(^{11}\) The definition of c-command relevant for our purposes is based on the notion of maximal projection. Following Belletti and Rizzi (1981, 145), c-command can be defined as in (i).

(i) \(\alpha\) c-commands \(\beta\) iff neither \(\alpha\) nor \(\beta\) dominates the other, and the first maximal projection dominating \(\alpha\) dominates \(\beta\).

Similar definitions of c-command in terms of the notion of maximal projection can be found elsewhere in the literature (Aoun and Sportiche (1980), Chomsky (1981; 1982), etc.). I adopt (i) largely for reasons of brevity. It will be modified in the next paragraph somewhat in the direction of Reinhart (1976). Saito (1983) discusses pros and cons of various definitions of c-command.

I take S to be a projection of Infl, but not maximal. I suggest below that Comp and Infl compose the joint head of S'. The definition in (i) as it stands does not prevent c-command from obtaining between the subject NPs of (22), but note that (22) and similar examples involve an adjunction structure, and here I assume that heads c-command everything dominated by the topmost item of their categorial projection but that nonheads can only c-command those elements dominated by the first such projection.
to an  symbol, and the second establishes an  symbol that enforces the obligatoriness and locality of SR that were illustrated earlier.

Aoun (1981; 1982; forthcoming) argues that  elements participate in a generalized binding theory that covers both  and  elements in contrast to the binding theory of Chomsky (1981), which is relevant only to  positions. Such a generalized binding theory admits four logical possibilities:

(23) a. A bound/free with respect to A
   b. A bound/free with respect to  
   c.  bound/free with respect to A
   d.  bound/free with respect to  

(23a) is the familiar A-binding relation, say between a reflexive direct object NP and an antecedent in subject position (John  bit himself). The binding relation induced by Wh Movement exemplifies (23b); the wh-operator binds its trace in A-position from Comp, an  position (I wonder who, Bill bit ei). (23c) is the sort of relation that obtains between, for example, a reflexive clitic and its antecedent in Romance languages (Jeani se; rase ‘John shaves himself’). Consider now (23d). A natural example of this relation holds between a wh-trace in Comp bound by an element in a higher Comp (assuming successive-cyclic movement of wh) or perhaps between an object clitic adjoined to a verb bound from Comp in a language with a resumptive pronoun relativization strategy.

For the SR cases at hand, I propose that the same-subject marker be classified as an  anaphor and that the different-subject marker be classified as an  pronominal. Thus,

(24) SS = [+anaphor, -pronominal]
     DS = [-anaphor, +pronominal]

Principles (A), (B), and (C) carry over intact from the A-binding system to the  binding system;  is subject to principle (A), and  to principle (B). (23d) is then the relevant binding relation for present purposes.

(25) A. An anaphor is bound in its governing category.
     B. A pronominal is free in its governing category.
     C. An R-expression is free (in all categories).

12 The traditional terms proximate and obviative might make the intended distinction more appropriately here. In particular, it might be possible to classify both  and  as  anaphors (this establishes the necessary locality requirements) and then tag  as proximate and  as obviative. This results in the proper interpretation, following remarks in footnote 15. This way of implementing the proximate/obviative distinction was suggested to me by James Higginbotham. The classification of an element as an “obviative anaphor” recalls the “disjoint anaphor” of Saxon (1984).

13 The definition of governing category is as follows (cf. Chomsky (1981)):

(i)  is the governing category for  iff  contains , a governor of , and a SUBJECT accessible to  (where coindexing  with SUBJECT does not violate the i-within-i Condition and SUBJECT c-commands ).

I make the usual assumption that in a tenseless clause [NP,S] is SUBJECT and that Agr functions as SUBJECT in a tensed clause. Further, [NP,S] and Agr are coindexed at the appropriate level of representation (no later than S-structure, presumably). Whether this coindexing is effected by superscripting or subscripting is largely immaterial, if we assume that superscripting between [NP,S] and Agr induces transfer of subscripts as well.
Regarding the placement of SS and DS, there is some evidence from Eastern Pomo (McLendon (1975)) and Seri (Moser (1978)) to support the claim that SS and DS occupy Comp. Specifically, the SR markers carry meanings in addition to those associated with the subject-switching function; in particular, they carry meanings that specify temporal relations between the clause marked for SR and the one superordinate to it (Muysken (1983) and Muysken and Lefebvre (forthcoming) discuss temporal relations between main and SR clauses in Quechua). Unlike English before or after, these SR markers do not appear in construction with NPs (as in after the ball, before the final act, etc.); their distribution is limited to immediately postclausal environments. They seem to be mirror-image counterparts of elements like English while, which appear exclusively in preclausal position (e.g. While Nero fiddled). McLendon (p.89) gives the chart shown in table 1.

In Seri the different-subject markers ta and ma cooccur with the tense morpheme, signaling "dependent future" and "dependent past," respectively. In addition, the clauses superordinate to these markers are marked for compatible tenses. Ta anticipates "both that the verb of the following main clause is also future and that the main clause has a different subject . . . ma anticipates both that the verb of the following main clause is also past or present and that the main clause has a different subject" (Moser (1978, 114–115)). In addition to SR, Washo SS and DS designate varieties of tense, and they also serve a subordinating function (Jacobsen (1967)). These additional meanings of the SR markers clearly have a Comp-like quality, and on the basis of this I will assume that SS and DS are daughters of the lower Comp in the structure in (22) (see also Hale (1983) and Simpson and Bresnan (1983), where Warlpiri morphemes that have effects similar to SR are analyzed as infinitival complementizers).

A dependency between Infl/Agr and Comp has frequently been noted in the literature (Stowell (1981), Pesetsky (1982), Gazdar (1981)), and this dependency will be exploited

<table>
<thead>
<tr>
<th>Table 1. SR markers in Eastern Pomo</th>
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<tr>
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<tr>
<td>Action of suffixed verb precedes in time that of main verb.</td>
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<tr>
<td>Action of suffixed verb (i) explains, justifies that of main verb; (ii) is simultaneous with that of main verb.</td>
</tr>
<tr>
<td>Action of suffixed verb is prior to and a prerequisite for the realization of the action expressed by the main verb.</td>
</tr>
<tr>
<td>Action of main verb continues over same period or begins with time specified by suffixed verb.</td>
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in the analysis of SR. Specifically, following a suggestion of J. Aoun (personal communication), I will assume that a subordinating morpheme found in Comp forms a discontinuous constituent with the Infl/Agr node, or, equivalently, that Comp and Infl/Agr are the joint head of S'. One effect of this assumption is that the dependency between these elements can be accounted for directly; another effect of this assumption, coupled with the rule coindexing [NP,S] with Agr (see footnote 13), is that the element in Comp will share the index of [NP,S]. Consider now a structure of the form of (26), reindexed to reflect the assumptions so far.

(26) \[ S' \]
    \[ S \]
    \[ Comp \]
    \[ S' \]
    \[ S \]
    \[ Comp \]
    \[ NP \]
    \[ VP \]
    \[ Agr \]
    \[ SS/DS \]

NPj VP Agrj

Now that we have proposed a structural position for SS/DS, it is necessary to determine the governing category. Recall from definition (i) of footnote 13 that for a given category to be a governing category for a given element, it must contain the element in question, a governor of it, and a SUBJECT accessible to it. Following Belletti and Rizzi (1981), I will assume that the notion "government" is such that the head of a category can govern the head of a sister maximal projection as well as the projection itself. Thus, in the configuration in (27), X governs both Y and Y-max.

(27) \[ X \]
    \[ X \]
    \[ Y \]
    \[ Y-max \]

With this head-to-head definition of government and the assumption that the Comp-Infl/Agr complex is the head of S', it follows that the Comp-Infl/Agr complex of the top clause in (26) governs that of the bottom clause. Since government is a special case of

14 More formally, government may be defined as follows (Belletti and Rizzi (1981, 123)):

(i) \( \alpha \) governs \( \gamma \) in a configuration like \[ \phi \ldots \gamma \ldots \alpha \ldots \gamma \ldots \]

where:

(a) \( \alpha = X^0 \) (= a lexical element),
(b) where \( \phi \) is a maximal projection, if \( \phi \) dominates \( \gamma \), then either \( \phi \) dominates \( \alpha \), or \( \phi \) is the maximal projection of \( \gamma \),
(c) \( \alpha \) c-commands \( \gamma \).
c-command and Agr counts as SUBJECT, the Agr of the matrix clause is the SUBJECT accessible to the Comp position of the lower clause in (26). The matrix clause then is the governing category for SS/DS. To summarize: in (26) Agr(/Comp); c-commands and governs (Agr/Comp), the governing category for SS/DS is the immediately superordinate clause, and NP does not c-command NP.

With the above definitional matters out of the way, let us now apply the Ā-binding principles to the structure in (26). DS is an Ā-pronominal, and by principle (B) it must be free in its governing category. The Ā prefix on pronominal means that DS must be free of Ā-binders in its governing category; whether it is coindexed and c-commanded by an element in an A-position (i.e. A-bound) is irrelevant to the Ā-binding principles. All that is required is that DS be free of Ā-binders. In the structure in (26), then, DS and the higher Agr node (also in an Ā-position) cannot be coindexed. By transitivity of indexing, it follows that NP; and NP cannot be coindexed; that is, i cannot be equal to j when DS occupies the lower Comp position. If the two NPs were coindexed, then by the rule coindexing [NP,S] with Agr(/Comp), DS would share an index with the upper Agr, violating principle (B): DS, an Ā-pronominal, would be bound in its governing category.

The reverse must hold if SS occupies the lower Comp position in (26). SS is an Ā-anaphor, and it must be bound by an Ā-element in its governing category. Again, it is irrelevant whether or not SS is bound by an element in A-position. What matters is that it be c-commanded by and coindexed with an Ā-position. If the subjects of the two clauses in (26) are coindexed, then (again by transitivity) SS will share its index with the c-commanding Agr node, and it will be Ā-bound in its governing category. If the two NPs are not coindexed, then Agr and SS will not be coindexed. In this case SS will not be Ā-bound, violating principle (A) of the binding theory.

To see this all more clearly, consider the schematic structure in (28).

(28)

```
            S'
             |
            S    Comp
             |
            S'    |
             |
            S    |
             |
           NPj    Agrj    DSj

(a)     (b)     (28a)     (28b)
```

The Ā-binding system is satisfied in both (28a) and (28b). DS is free of Ā-binders in (28a) in its governing category, and SS is Ā-bound by Agr in (28b) in its governing
category. Again, since SS and DS participate only in the \( \Lambda \)-binding system, they may be coindexed and c-commanded by something in an A-position with no undesirable consequences. Also, again to recapitulate, there is no c-command between NPs in the above structure; there is no A-binding, but there is \( \Lambda \)-binding.

Consider now (29), which is identical to (28) except that the indices of SS and DS are reversed.

\[ (29) \]

\[
\begin{array}{c}
S' \\
\downarrow \text{Comp}_i \\
S \\
\downarrow \text{NP}_i \ldots \text{Agr}_i \\
\downarrow \text{S'} \\
\downarrow \text{S} \\
\downarrow \text{NP}_j \ldots \text{Agr}_j \\
\end{array}
\]

Here DS is \( \Lambda \)-bound by Agr, which leads to a violation of principle (B) of the binding theory, and SS is \( \Lambda \)-free, which leads to a violation of principle (A). Neither of these structures is well-formed.

The foregoing analysis captures the obligatory nature of SR in a straightforward manner. [NP,S] is coindexed with Agr by the familiar rule, and the index spreads to Comp. Where the subjects of two clauses are coreferential, they will be coindexed, and these same indices will appear on the relevant Comp/Agr constituent. SS and DS will thus be coindexed with the subject of the clause containing them. Given the anaphoric or pronominal properties of SS and DS, the binding principles enforce the correct results: SS with coreferential subjects and DS with noncoreferential subjects.\(^{15}\)

The structure of (15), the ATB SR example from Diyari, would be as in (30), where the different-subject marker in each clause is unbound by the upper Agr.

\(^{15}\) Although the "transitivity of indexing" utilized above may be sufficient to explain the facts under discussion, there is more to be said concerning the interpretation of these indices. Specifically, note that the coindexing between [NP,S] and Agr encodes ordinary subject-verb agreement, and the coindexing (or lack of it) between Agr and SS/DS encodes antecedence (or lack of it). What we have here, then, are two different linguistic relations (agreement and antecedence) conspiring to give the SR effect. James Higginbotham suggests (personal communication) that if A and B are mediated by agreement, then whatever has the one as antecedent has the other as antecedent. Antecedence between upper Agr and SS is then transmitted through agreement from one subject NP to, ultimately, the other. Since DS can have no antecedent in its governing category, the antecedence relation cannot obtain between the relevant NPs. If the suggestion in footnote 12 is adopted, then DS would have an antecedent, and its property of being a "proximate" would rule out coreference between the two subject NPs; that is, whatever agrees with the antecedent of DS is not in the antecedent relation with what agrees with the Agr coindexed with DS.
This analysis also accounts for the local nature of SR. Recall that the appearance of an SR marker is conditioned by the coreference relation between the NP subject of its clause and the NP subject of the clause immediately superordinate to it. This follows from the fact that the governing category for an arbitrary SR marker extends only one clause up from its position in Comp; the indexing patterns of any NPs and SR markers higher than this in the structure are completely free with respect to it. In the following structure, then, the respective governing categories of the occurrences of SS and DS extend upward only as far as indicated.
Where \( j = i = k \) in (31), the SR-marking must be \( SS \) all the way up. Where \( j = i \neq k \), the lowest Comp will contain \( SS \) and the intermediate Comp will contain \( DS \). Where \( j \neq i \) and \( i \neq k \), both Comps will contain \( DS \), although the subject of the top clause may be (but need not be) coindexed with the subject of the lowest clause \( (j = k) \). The latter case illustrates the strict locality of SR; it is only the clause immediately superordinate to the SR marker that determines whether the SR marker is \( SS \) or \( DS \). If the subject of this clause is noncoreferential with the subject of the next clause up, \( DS \) is required, even though there may be a coreferential subject higher in the tree.

Finally, the proposed analysis captures the subject orientation of SR. The \( \tilde{A} \)-element with respect to which \( SS \) is bound and \( DS \) is free is coindexed with the subject of the upper clause. It is the link between \([NP,S]\) and Agr and the link between Agr and \( SS/DS \) that give the subject-to-subject effect. SR-marking between, for example, an upper direct object and a lower subject would require the presence of an \( \tilde{A} \)-element coindexed with the object that c-commands \( SS \) or \( DS \). Presumably, any \( \tilde{A} \)-element coindexed with a direct object would occur internal to VP and would not c-command \( SS/DS \).

Given that the necessary configuration in these SR situations (and in binding in general) is c-command, we might expect to find an atypical variety of SR between a lower object and an upper subject (in contrast to lower subject and upper object, where c-command would not hold). The Yup'ik case alluded to in footnote 7 is exactly that case. Here, according to Payne (1980), \( ni \) (the "4th person") signals that the object of the lower verb is coreferential with the upper subject.

\[
\text{(32)} \quad \text{Doris-am Tom-aq cinga-llra-Ø-ni / quyau-q} \\
\quad \text{Doris-erg Tom-abs kiss-because-3sg:subj-4th:obj / happy-3sg} \\
\quad \text{‘Because Doris kissed Tom, he, is happy.’}
\]

Although the exact details of a binding theory analysis of \( ni \) (discussed in Finer (1984)) are irrelevant to immediate concerns, it is important to note that there is a c-command relation between the upper Agr and \( ni \) in the lower clause; given this, SR effects can be derived.

3. Summary

This completes the formal analysis of basic switch-reference patterns. The essential properties of the phenomenon, listed in (33), have been captured by the interactions of the \( \tilde{A} \)-binding system with the assumptions in (34).

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16. Here the assumption that the languages under discussion are configurational does make a difference; cf. footnote 10.

17. This footnote contains a miscellany of topics that are reflected in more complicated cases of SR; space limitations prevent me from discussing them further. SR-marking becomes more complex when the relation between the subjects is neither coreference nor disjoint reference. In particular, there appears to be parametric variation among SR languages when matters of inclusive reference are considered. In some SR languages, for example, a sentence corresponding to After we ate, I slept receives same-subject-marking, while in other languages, such an example receives different-subject-marking. See Langdon and Munro (1979), Finer (1984), and the papers in Munro (1980) for further discussion of these cases as well as discussion of SR-marking with...
(33) a. SS signals obligatory coreference between subject NPs of hierarchically adjacent clauses.
b. DS signals obligatory noncoreference between subject NPs of hierarchically adjacent clauses.
c. The same-subject or different-subject relation is determined strictly locally.
d. Switch-reference involves subjects only.

(34) a. SS is an Ā-anaphor.
b. DS is an Ā-pronominal.
c. SS and DS are generated in Comp, form a discontinuous constituent with Infl/Agr, and are coindexed with [NP,S] of the sister S.

Thus, even though the NP subjects cannot enter into a binding relation, it is still possible to account for the binding effect between them, exotic as it may first appear, with the binding theory. Ā-elements coindexed with the subjects appear in configurations that allow binding to occur, or prevent binding from occurring, between Ā-positions. Same-subject-marking is a reflex of principle (A), which forces binding, and different-subject-marking is a reflex of principle (B), which prohibits it; by transitivity, the NP subjects are coindexed in the environment of SS and not coindexed in the environment of DS.

References


respect to weather-verb constructions. Davies (1981; 1982a,b) discusses SR in inversion structures and in cases involving SR with respect to possessors in inalienable possession constructions within a Relational Grammar framework. Lynch (1983) discusses SR data from the Polynesian language Lenakel, which exhibits alternation between $θ$ (SS) and a verbal agreement prefix (DS). This opposition supports the relation between Comp and Agr assumed above, although it may be a reflection of some form or another of the "avoid pronoun" strategy. However, both Lynch (1983) and Haiman (1983) analyze SR in Lenakel as involving coordinate structures and a generalized rule of Gapping (deletion of one agreement marker under identity with another). Another empirical domain where SR obviation effects have been noted is the Romance subjunctive construction; here I will simply note that the hypothesis that the subjunctive morphology is an Ā-pronominal (in the sense of DS) looks promising. In a similar vein, the "logophoric" pronouns of various African languages might fall under the Ā-binding system (see Clements [1975] and Hyman and Comrie [1981] for discussion of logophoric elements). Also, the effects of the complementizer suffixes of Warlpiri bear more than a family resemblance to SR, although it is not clear to me at this point whether the analysis of these elements should derive from a theory of grammatical relations (as in Simpson and Bresnan [1983]), a theory of thematic relations (as in Williams [1984]), or some version of the binding theory. Data concerning the possible interactions of SR with PRO subjects, quantified-NP subjects, small clauses, etc., are currently unavailable to me.


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