0. Introduction

Switch-Reference (SR) is a phenomenon in which the coreferentiality of two (or more) subjects in a complex sentence is indicated by a morphological device. Thus, in the English sentences in (1), there is no morphological distinction between (a) and (b) regardless of the difference in interpretation. On the other hand, Mojave (Yuman) indicates such a distinction by a difference in suffixes, i.e., -k/-m, as demonstrated in (2).

(1) a. When he1 came in, he1 was eating pizza.
   b. When he1 came in, he1 was eating pizza.

(2) a. nya-isvar-k i:ma-k
    when-sing-SS dance-tns
    'When he1 sang, he1 danced'
   b. nya-isvar-m i:ma-k
    when-sing-DS dance-tns
    'When he1 sang, he1 danced' (Langdon & Munro 1979)

SS=same subject, DS=different subject

Investigations into SR have a long history, beginning most explicitly in Jacobsen (1967) and continuing through Haiman & Munro (1983). Most recently, Finer (1984, 1985) presents an analysis of SR within Government and Binding Theory. This paper presents an alternative.

1. Finer's Analysis

Finer (1984, 1985) first observes that SR is local and obligatory. In order for these properties to hold, he makes the assumptions in (3).

(3) a. A given (SR) language has a configurational structure, and
    this, has a VP node.
   b. SR morphemes exhibit a "COMP-like" quality, and occupy
    the COMP node in a phrase-structure tree.
   c. SR refers only to subjects of clauses (not objects).
   d. Subject is defined structurally as [NP, S].
   e. SR appears always in a subordination environment and
    not in a coordination environment.

On the basis of the assumptions in (3), he proposes the following hierarchical structure for SR constructions.
Given the structure of (4), Finer contends that coreference associated with SS and non-coreference associated with DS are explained by extending the Binding Theory of Chomsky (1981) to A'-Binding, assuming that SS/DS are in A'-position. He classifies SS as an A'-anaphor [+anaphoric, -pronominal], and DS as an A'-pronominal [+anaphoric, +pronominal]. SS, as an A'-anaphor, and DS, as an A'-pronominal, are subject to the Binding Theory of Chomsky (1981) as in (5), which Finer applies to A'-Binding.

**5. Binding Principle**

A. An anaphor is bound in its governing category
B. A pronoun is free in its governing category
C. An R-expression is free

There are three additional assumptions relevant to his analysis. First, in the configurational structure of (4), COMP and INF/AGR are jointly the head of S'. Second, assuming [NP, S] and AGR are coindexed, the element of COMP shares the index of [NP, S], thereby coindexing all three (of [NP, S], AGR, and COMP). Third, the notion of government is expanded, as in Belletti & Rizzi (1981), in such a way that the head of a category can govern the head of a sister maximal projection as well as the projection itself. In this system, since SS is an A'-anaphor, it should fall under the Binding Principle (A) in (5) SS must be bound by an element in A'-position in its governing category. This means that SS must be c-commanded and coindexed by an element in A'-position. (6) illustrates this situation.

In (6), the governing category for the SS is the topmost S'. Thus, the SS must be coindexed and c-commanded by an element in A'-position in the topmost S'. The only candidate for the binder is the joint head of the topmost S', i.e., COMP/AGR. Since the upper COMP/AGR only shares the index (i) with the SS/AGR but also c-commands it, that SS is bound in its governing category. Recall that Finer assumes that [NP, S], AGR, and COMP share the same index. Thus, the fact that the upper COMP/AGR binds the lower COMP/AGR, according to Finer, entails that the upper NP and the lower NP are referentially linked, by way of the "transitivity" of indices.

A DS structure can be represented by the diagram in (7).

DS is an A'-pronominal, and thus, it must be free from an element of A'-position in its governing category. In (7), the governing category for DS is the topmost S'. The only A'-element which DS would be free from is the upper COMP/AGR pair. The latter c-commands the DS, but they do not share indices. They are differently indexed. Thus, the DS is free of the upper COMP/AGR. This implies that the two [NP, S]'s are not referentially linked to each other.

To sum up, Finer's syntactic analysis of SR is based on the assumption that SS is an A'-anaphor and DS is an A'-pronominal, both of which are subject to the Binding Principle of (5). Crucially, coreference/non-coreference of SS/DS is explained not by a direct relation between the two (NP, S)'s, but rather, by the head-to-head relation between the two A'-elements, coupled with the transitivity of indices among [NP, S], AGR, and COMP.

At this point, I would like to re-examine Finer's assumptions listed in (3). First of all, the languages which exhibit the SR phenomenon are not limited to configurational languages. For example, it is widely discussed that Warlpiri is a non-configurational language, and Warlpiri does have the SR phenomenon, as shown in (8).

(8) a. Ngarrake ka wirnrirli-mi kuluparnta
    man-ABS PRES whistle-NPST bellicose-ABS
    karli jortni-rninje-karra
    boomerang-ABS trim-INF-SR

    'The bellicose man is whistling while trimming the boomerang'
The underlined words (i.e., karra and kurra) in (8) are SR morphemes. The former indicates that the subject of the infinitive clause is interpreted as coreferential with the subject of the main clause, while the latter suggests that the subject of the infinitive clause is understood as coreferential with the object of the main clause. Therefore, the referential properties of SR morphemes in non-configurational languages like Warlpiri are left unexplained.

Second, Finer’s claim that SR morphemes have a “COMP-like” quality is based on the fact that some SR morphemes bear information about interclausal temporal relationship. An example is the contrast between the SR morphemes te and ma in Seri:

(9) a. po-k6o te / in-sft-??lit-a?/a
   DF-be:all SCF 2:subj-fut-eat-TM
   ‘They being all, you will eat them, i.e., You should eat them all’

b. t-k6o ma / j-nf-lotkka
   DF-be:all SCP 3:obj-perf-eat:pl
   ‘It being all, they ate it, i.e., They ate all of it’

(Moser 1976)

The SCF (subject-change/future) morpheme te indicates that the tense of the following main clause is also future and that the main clause has a different subject. The SCP (subject-change/past) morpheme ma provides the information that the tense of the main clause is also past or present and that the main clause has a different subject. Because of the temporal properties of such SR morphemes, Finer assumes that SR morphemes have a “COMP-like” quality, and so occupy the COMP position in a phrase-structure tree as in (3). Contrary to his assumption, though, the temporal/aspectual value observed above appears more AUX-like than “COMP-like”, according to the criteria that Steele et al. (1981) propose. It is not clear why temporal/aspectual reference across two clauses should count as “COMP-like” quality; COMP is not commonly taken to involve temporal reference. And, he does not state explicitly what exactly “COMP-like” quality refers to. Further, if the temporal character of some SR morphemes is what argues for their position in COMP, it is unclear why SR morphemes lack such information should be in COMP.

Third, there are apparent counterexamples against the subject orientation in (3c). One clear example is found in Copanahua (Panano). According to Loos (1963), the two SR morphemes, -caj and -ton, refer to the object of the main clause and the subject of the subordinate clause to indicate the coreference of the two. In this case, the object in the upper clause would be under the upper VP in (4), and thus, that object would not be able to c-command the COMP/AGR pair in the lower clause. Furthermore, even if the c-command relation were somehow established between the two elements in question, the present situation would end up with some element in an A-position binding another element in an A-position. The existence of suffixes like -caj and -ton in Copanahua contradicts Finer’s assumption about the subject orientation of SR. This suggest that c-command is not a necessary condition for all instances of SR. Since Finer’s analysis crucially depends on the subject orientation of SR coupled with the c-command requirement, his theory would not extend to SR systems like that in Copanahua.

Fourth, the structural definition of subject as [NP, S] does not obviously hold for all the SR languages. For example, in Hopi, which has a SR system, dual subject is marked as the combination of plural in [NP, S] (or NP) and singular on a verb, and thus, the subject is not localized to a single node in a tree. As I discussed in Tsujimura (1986), some mechanism of unification (or amalgamation) of the two number values is necessary, and thus, the definition of subject in this case requires more than just a localizable element.

Finally, the last assumption—that the SR phenomenon occurs only in a subordination environment and in a coordination environment—is also crucial to Finer’s analysis because, in a coordination environment, one subject would not c-command the other subject, and consequently the Binding Principle could not apply. Although the term “subordination” and “coordination” are never clearly defined in the literature, there are some diagnostic tests to distinguish the two environments. For instance, consider the contrast in (10) regarding the order of the nominal and the pronoun.

(10) a. John ate lots of pizza, and he went to bed.
   b. *He ate lots of pizza, and John went to bed.

In coordination, the nominal must precede the pronoun which is coreferential with it. On the other hand, in subordination, the linear order of the two items does not matter. Furthermore, coordination allows for “across-the-board” extractions, as in (11), but subordination does not.

(11) I saw the deer which I shot and John skinned.

Given these diagnostic tests, Popago appears to be a language which has a SR system in a coordination environment. Moreover, according to Payne (1980), Chickasaw has two sets of SR morphemes, one for subordinate sentences (-/nasalization) and another for coordinated sentences (fixation of a glottal stop after
the penultimate vowel of the clause and suffixion of -che/-ng after the final vowel). As I mentioned above, the elimination of a coordination environment from the SR phenomenon is crucial to Finer’s analysis (cf. (3)). However, lack of convincing arguments to support such an elimination would lead one to wonder whether (4) is the structure which describes SR systems adequately, especially in the presence of the above-mentioned observations regarding Papago and Chickasaw.

2. Categorial Analysis of Switch-Reference

In short, we still need a theory which can accommodate the vagaries of SR phenomenon. I will propose one within Categorial Grammar. A basic tenet of Categorial Grammar that I will assume is that any complex expression is analyzable as the application of a functor and an appropriate argument, and each functor and argument can be further analyzable into a functor and its argument until the analysis reaches to simple expressions with known properties. Thus, I adopt the assumptions in (12), which are summarized in Steele (forthcoming):

(12) a. Every coherent expression composed of two or more parts (i.e., composite) has a functor and (at least) one argument

b. The argument(s) must be compatible with the functor

c. The argument(s) is itself (are themselves) potentially composed of another (compatible) functor/argument pair.

One consequence of these assumptions is that a number of so-called “agreement” phenomena can be explained without stipulating additional rules and/or principles. To see this consequence, consider the following situation. Suppose there are three expressions, X, Y, and Z, of which X is a functor and Y and Z are its logically possible argument. Suppose, further, that X, Y, and Z are specified with the features [+F], [+F], and [-F], respectively. This situation can be illustrated in (13).

(13) a.  

b.  

If the results of the compositions in (13a) and (13b) are required, by the subcategorization property of the functor X, to be such that each composite agree in the feature F, then the assumption stated under (12b) above will automatically make the composition of X and Z as in (13b) impossible because of the absence of compatibility between the functor X and its argument Z. Hence, this type of agreement phenomena follows directly from assumption (12b). Furthermore, the agreement phenomena which follow from (12b) can be extended further to what might be characterized as “disagreement.” For example, suppose expressions X’, Y’, and Z’ are available with the specifications of [+F], [-F], and [-F], respectively. We assume that X’ is a functor, and Y’ and Z’ are logically possible arguments for X’, as in (14).

(14) a.  

b.  

Suppose this time that the expression composed of the functor and its argument is required, by the subcategorization property of the functor X’, such that the composites must disagree in the feature F. Assumption (12b) will eliminate a compositional rule which would put X’ and Y’ together this time, as in (14b). The contrast observed between (13) and (14) can be attributed to the subcategorization properties of the functors X and X’. Therefore, given specific properties of a functor, the assumption stated in (12b) will throw out incompatible combinatory possibilities determining a grammatically relevant argument for that functor and, at the same time, explaining the “agreement” or “disagreement” relationships between each composite. Furthermore, the phenomena of agreement and disagreement are subsumed under the same principle.

Such a consequence can be generalized to a SR system in a non-trivial way. That is, given the three assumptions introduced above, SR phenomena can be conceived of as falling into the “agreement” and/or “disagreement” phenomena, and therefore, follow from assumption (12b) coupled with the other two assumptions. To put it more precisely, I claim that a composite expression in which a SR marker appears forms a functor, taking another composite expression as its argument, and that the relation between the functor and its argument and the relation between some parts of the functor and its argument are characterized as “agreement” and/or “disagreement” controlled by the subcategorization properties of the SR marker. This claim can be schematized as the rules in (15).

(15) a.  

b.  

agreement

disagreement
The rules in (15) are schema over language-specific rules. (15a) shows the SS phenomenon: The property that SS bears conditions the relationship between the functor X and its argument Y as "agreement" (as conceived of above). In (15b), on the other hand, the property of DS specifies the relationship between the functor X and its argument Y as "disagreement". Thus, my contention is that whatever X, Y, and Z consist of in a given language, the relationship schematized in (15) should always hold for a SR construction in that language, following from assumption (12b). Furthermore, the nature of the relationship between the functor and its argument in (15) can be captured as "Government" in the sense of Bach (1983:70), who defines the term as follows: "If the form of an argument depends on properties of the functor, then we say the functor GOVERNS the relevant feature of the argument."

3. Switch-Reference in Hopi

Viewed as such, apparently different SR systems will be given a unified treatment. Below, I will demonstrate the application of the Categorial approach to the Hopi SR system. The sentences in (16) are illustrative.

(16) a. ?i-pava paki-t (pl?) pam qatip+ my-brother enter-SS (then) he sat-down
   'When my brother came in, he sat down'

   b. ?i-pava paki-g (pl?) pam qatip+d my-brother enter-DS (then) he sat-down
   'When my brother came in, he sat down'

In (16a), -t is a SS morpheme while -g in (16b) is a DS morpheme.

Crucial to the analysis of the SR system in Hopi is the definition of subject because not all the instances of subject in this language are localizable to a single element, as briefly mentioned above. Thus, I first define the subject in Hopi, and then, demonstrate how such a definition is accommodated in the treatment of SR systems as outlined above.

The pronouns in Hopi can be divided into two categories, i.e., singular and plural. The inventory of the pronouns is shown in (17).

(17)

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(The nature of the number marking for singular and plural subjects is rather straightforward: When both a pronoun and a verb are marked as singular, the "subject" counts as singular; and, when both of them are marked as plural, the "subject" counts as plural. The number marking of a dual pronominal subject, on the other hand, is somewhat different: The pronoun is marked as plural while the verb is marked as singular. In (16) and (19) the (a) sentences, which contain dual subjects, are contrasted with the (b) sentences with plural subjects.

(16) a. ?i-pava paki-t (pl?) pam qatip+ my-brother enter-SS (then) he sat-down
   'When my brother came in, he sat down'

   b. ?i-pava paki-g (pl?) pam qatip+d my-brother enter-DS (then) he sat-down
   'When my brother came in, he sat down'

In Tsujimura (1986), I proposed that the number value crucial to the notion of subject should be amalgamated—or, unified, borrowing the term from Unification Theory (cf. Kay (1979) and Shieber (1986))—from the number value of the NP and that marked by the verbal morphology. More precisely, I set the cardinality of the pronominal forms and verbs as in (20).

(20) a. If x=value of pro-N[sg], then Card (x)=1

   b. If x=value of pro-N[pl], then Card (x)=2

   c. If x=subject of V[sg], then Card (x)=2

   d. If x=subject of V[pl], then Card (x)=2

Given such a cardinality, suppose that the unification amounts to the extraction of the cardinal number(s) shared by a pronominal and a verb. The result of such a process is shown in (21), where x indicates the cardinal number(s) as a result of the unification.
In 05, the subcategorization property of the SS (-t), which I specify as [+proximate], requires that there be an "agreement" relation between the subject of the functor (i.e., the SR-clause) and that of the argument (i.e., the p). Moreover, I apply a unification mechanism here again: That is, when the two subjects are in an "agreement" relation, they undergo unification, so that they may be interpreted as referring to a single individual. In (23b), on the other hand, the SR morpheme is a DS, and thus bears the value of [-proximate]. This [-proximate] value requires that the functor take an appropriate argument which would establish a "disagreement" relation between the two subjects. Being in a "disagreement" relation, the two subjects cannot undergo unification, and therefore, they are interpreted as different individuals. Hence, the form of the subject of a proposition which is going to be chosen as the argument of the SR-clause (the functor) is, in effect, controlled by the property of the SR morpheme, namely, [+proximate] or [-proximate] in the present case. In this regard, we can characterize the relation between the functor (i.e., SR-clause) and its argument (i.e., proposition) as GOVERNMENT, in the sense of Bach (1983), since the form of the subject in the argument depends on the property of the SR-clause (which is ultimately the property of the SR morpheme).

4. Summary

In this paper I have discussed Finer's recent work on SR within the Government and Binding framework, and have briefly discussed its descriptive inadequacies. As an alternative I have proposed an analysis within Categorial Grammar. Assuming that a functor and its argument must be compatible, I have claimed that "Agreement" (subsuming "agreement" and "disagreement") can be accounted for without any further stipulations. I further argued that the consequence of such a functor-argument relationship can be extended to SR system in general, given an additional assumption that the subcategorization properties determines the nature of the "Agreement" relationship. I have proposed that a SR clause is a functor which takes a proposition as its argument, and yields another proposition. Under such a view, I claimed that SS should be treated as an instance of "agreement" while DS as an instance of "disagreement", the choice of which depends on the subcategorization properties associated with the SR morphemes. Therefore, in Hopi, for example, the value [+proximate] is associated with the SS morpheme, -t, while the DS morpheme, -g, is accompanied by the value [-proximate], and those values fix the former case as "agreement" and the latter case as "disagreement". Among other things, one consequence drawn from the Hopi example is that the Categorial approach discussed above can accommodate some global properties in a language (e.g., the subject in Hopi) to the general schema for SR-phenomenon outlined in (15).

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On the Learnability of the Scope of Reflexivization

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Based on data like the examples in (1),

(1). a. The announcement about (him/himself) upset John.

b. John puts messages to (him/himself) in the red folder.

Bach and Partee (1980) and Culicover and Wilkins (1984) question the sufficiency of configuration-based accounts of reflexivization. Any theory of anaphors that must rely strictly on syntactic configuration to distinguish their distribution from that of the pronouns will run into difficulty where the distributions may overlap.

Additionally, a configuration-based theory will be hardpressed to distinguish the meaning difference between the anaphoric and pronominal versions of (1). The correct interpretation of, say (1b), will depend on who is understood to be the writer of the 'messages to John'. That is, the theory of reflexivization must take into account a non-overt argument of the nominalizations messages. Where the sender of the messages is John, the anaphor himself is appropriate; where the sender could be anyone, then the pronoun him is used. The situation is further complicated because this distinction cannot be attributed simply to the interpretation of some syntactic, but phonologically null, element such as PR. As Williams (1985) argues, NPs cannot be convincingly analyzed as admitting PRU subjects. This is substantiated by examples like (2), unless NPs are permitted doubly-filled subjects.

(2) John put yesterday's messages to (him/himself) in the folder.

Another type of case where the occurrence of an anaphor would seem to depend on nonconfigurational information is discussed in terms of predication by Hellan (1985,1986), Wilkins (1985), and Maling (1986).

Predicational structure affects anaphoric relations:

(3) Norwegian: *Vi fortalte Jons om seg selv.
    We told J. about SELF

(4) *Johns saw a snake near himself. (cf. near him)