

Switch-Reference and Logophoricity in Discourse Representation Theory

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For G.R.G.W.

Declaration

I declare that this thesis has been composed by myself and that the research reported therein has been conducted by myself unless otherwise indicated.

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Abstract

In central cases of switch-reference, a marker on the verb of one clause is used to indicate whether its subject has the same or different reference from the subject of an adjacent, syntactically related clause. In central cases of logophoricity, a special pronoun form is used within a reported speech context, to indicate coreference with the source of the reported utterance.

Descriptions of the switch-reference systems of particular languages often identify particular uses of the switch-reference markers as 'unexpected', 'aberrant' or 'exceptional'. In this thesis I start from the premise that these unexpected uses form a functionally coherent class, and argue for this by presenting data from a wide range of languages. I then propose a unified account of switch-reference within a grammar formalism which has a Discourse Representation Theory semantics (Unification Categorical Grammar). This account attempts to incorporate these functional extensions of switch-reference markers. Finally, the relationship between switch-reference and logophoricity is investigated and the DR Theory account is extended to handle logophoric systems.

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Note

The text-formatting program used to produce this thesis has an occasional problem with footnotes; the reader is therefore warned that a line at the bottom of a page can mean 'footnote approaching on a subsequent page'.

Chapter 1 Switch-reference phenomena

1.1. Introduction

Switch-reference and logophoricity are types of anaphoric linkage across clause boundaries which cannot be adequately accounted for by the Binding Theory. In central cases of switch-reference, a marker on the verb of one clause is used to indicate whether its subject has the same or different reference from the subject of an adjacent, syntactically related clause. In central cases of logophoricity, a special pronoun form is used within a reported speech context, to indicate coreference with the source of the reported speech. This thesis gives a detailed examination of the two phenomena and proposes an account for them which is formalised in Discourse Representation Theory.

The major concern of the thesis is the functional complexity of switch-reference systems. Switch-reference markers have a much richer range of functions than just indicating obligatory co/disjoint reference. I will show that switch-reference systems are inextricably linked with the marking of temporal meaning as well as nominal meaning. I will then consider a range of apparently aberrant uses of switch-reference markers which have been reported for many languages. I will argue that unexpected uses of 'same subject' marking can be explained if we revise our definition of the switch-reference relation to take account of agentivity. The unexpected uses of 'different subject' marking which occur in fact represent common and systematic functional extensions of switch-reference systems which should be accounted for by any comprehensive theory. My proposal is that the functional complexity of switch-reference systems can be accounted for if one regards switch-reference as having the clause rather than the NP as its semantic domain and as indicating agreement or dis-agreement between parameters of the eventualities described by the clauses it relates. I will show how this idea can be captured formally within the framework of Discourse Representation Theory, as embedded within the grammar formalism, Unification Categorical Grammar. A detailed illustration of the claims about switch-reference and of the proposed account will be given by providing the beginnings of a formal account for the switch-reference system of the Papuan language Amele.

A number of subsidiary concerns are addressed by the thesis. The most important of these is the relationship between switch-reference and logophoricity. In chapter 1 I argue that although switch-reference and logophoricity are functionally similar, may be regarded as ends of a continuum, and may be related historically, there is nothing to be gained by

attempting to subsume them one under the other. Having presented the account for switch-reference, I then return to the consideration of logophoricity in chapter 6, and propose a formal account for it within the same theoretical framework. I argue that the mechanisms used to account for switch-reference and those used to account for logophoricity are of the same kind.

The thesis falls into two main parts, with the first three chapters concerned with detailed but informal presentation of the argument and the final three chapters concerned with the presentation of the formal accounts of switch-reference and logophoricity.

In this chapter I give a typological survey of switch-reference phenomena which shows that the 'canonical' conception of switch-reference, upon which previous theoretical work has been based, is unrepresentative of the data in various significant respects. I start to build up a comprehensive description of the range of switch-reference phenomena which occurs crosslinguistically, and the criteria of adequacy to be satisfied by any comprehensive theory of switch-reference. This leads to a reconsideration of prevalent ideas in the literature about the kind of thing switch-reference is and how it should be handled formally. This description is further developed in chapter 2, where the range of aberrant uses of switch-reference markers is considered, with detailed description of data from Imbabura Quechua, Eastern Pomo, Lenakel and Amele. Then in chapter 3 an informal theoretical conception of switch-reference is argued for which attempts to satisfy these criteria.

General theoretical accounts of switch-reference, as opposed to descriptions of it in individual languages, or crosslinguistic descriptive typologies, are relatively rare. Givón (1983) and Haiman (1983) consider some theoretical issues in switch-reference from an informal point of view, and these will be reviewed in chapter 3. The only formal accounts which have been proposed to my knowledge have been Finer (1985a, b) and Tsujimura (1987). Since Tsujimura's account only became available at a late stage in the preparation of this thesis, I shall have virtually nothing to say about it here. Like the account proposed in chapter 5, hers uses a Categorical Grammar. Finer's account is formulated within the framework of Government and Binding Theory, and it will be briefly described and evaluated in this chapter.

1.2. The canonical conception of switch-reference

The sentence pairs in (1) and (2), from the North American language Mojave and the Papuan language Usan, are examples of switch-reference.

- (1) a. *nya-isvar-k* *i:ma-k*
 when-sing-SS dance-tns
 When *he_i* sang, *he_i* danced.
- b. *nya-isvar-m* *i:ma-k*
 when-sing-DS dance-tns
 When *he_i* sang, *he_j* danced. (Mojave; Munro 1980c:145)
- (2) a. *ye* *nam* *su-ab* *isomei*
 I tree cut-SS I_went_down
 I cut the tree and went down.
- b. *ye* *nam* *su-ine* *isorei*
 I tree cut-DS it_went_down
 I cut the tree down. (Usan; Haiman & Munro 1983b:xi)

In (1a) the subject of the first, subordinate clause has the same referent as that of the second, matrix clause, and to indicate this, the 'same subject' marker *-k* (homophonous with one of the tense markers) is used in place of tense on the verb in the first clause. In (1b) the 'different subject' marker *-m* is used to show that the subjects have disjoint reference. Note the absence of independent subject NPs.

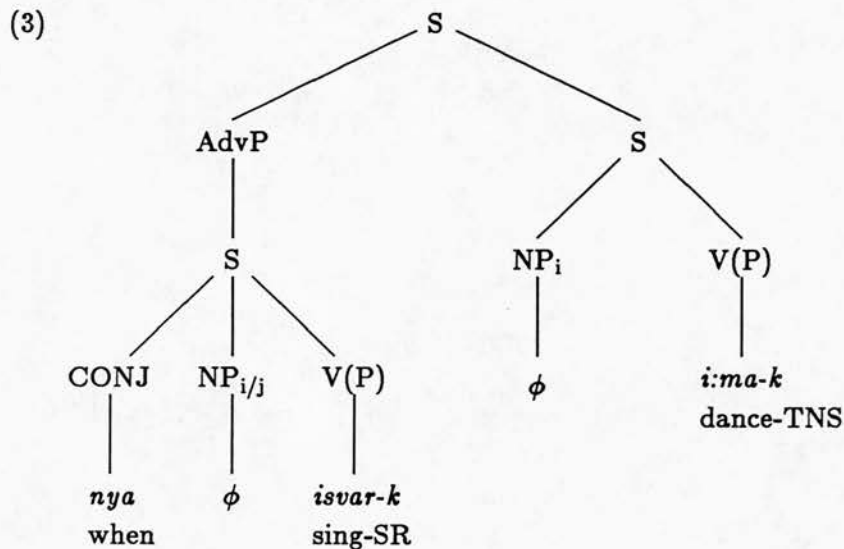
The clauses in (1) are intransitive; (2) gives similar examples with transitive clauses. In (2a) the same subject marker *-ab* is attached to the verb of the first clause, to show that the subject is coreferential with that of the second clause. In (2b) the different subject marker *-ine* is used to indicate that there is disjoint reference: in fact here, the subject of the second clause is coreferential with the direct object of the first clause.

Henceforth, the abbreviations 'SS' and 'DS' will be used for same and different subject markers, and 'SR' will be used for 'switch-reference marker', subsuming SS and DS. The clause marked for switch-reference, which is usually a subordinate or dependent clause (in a technical sense of 'dependent' which will be explained below), will be referred to as the 'marked' clause, and the other clause in the relation, which is usually an independent

clause that can stand alone and carries tense and other inflectional categories, will be referred to as the 'controlling' clause.¹

Notice that while switch-reference marking is necessary to disambiguate the subject reference in example (1), where both subjects are third person and there are no lexical NPs, it is not necessary for disambiguation in (2). It is this characteristic of switch-reference marking which has led it to be seen as a syntactic phenomenon rather than a discourse or pragmatic phenomenon: it is pervasive and regular and continues to operate even when non third person NPs or fully specified lexical NPs mean that it is not necessary for reference resolution. See *Finer (1985b:38f.)*, *Munro (1980b:2f.)*, *Haiman & Munro (1983b:xi)* among others for support of this argument.

The tree diagram in (3) gives a surface syntactic analysis of (1). The question of whether the language should be taken to have VPs or a flat structure is ignored here.



Switch-reference was first defined by *Jacobsen (1967)*, although certain of the phenomena of interest had been identified in American Indian languages earlier than this. See *Kroeber (1911)* on Yuki, *Hojjer (1949)* on Tonkawa, and *Oswalt (1961)* on Kashaya. Subsequently, switch-reference systems have been identified and studied in a range of American Indian, Non-Austronesian and Australian languages and in a small number of

¹ See *Jacobsen (1983:152ff.)* for a historical survey of terminology. Although most widespread, the abbreviations 'SS' and 'DS' are not entirely satisfactory, since they beg the question of whether the NPs related are always subjects.

African languages. Haiman & Munro (1983a) is a collection of papers representing a general typological survey; Jacobsen (1983) is an updated survey of switch-reference in the languages of North America; Austin (1980, 1981) gives a typological survey of switch-reference in Australia; and Longacre (1972) canvasses switch-reference in the languages of Papua New Guinea. Information on switch-reference in African languages can be found in Wieseemann (1982), Comrie (1983) and Sim (1988).

I shall not be directly concerned with the origins of switch-reference systems in this thesis. Their apparent diversity is reflected in the homophony exhibited in a significant number of switch-reference systems between switch-reference morphemes and aspectual markers, tense morphemes, case inflections and subordinating clitics. See Jacobsen (1983), Givón (1983) and Haiman (1983). There is some evidence for an element of areal diffusion in the development of switch-reference systems. The geographical distribution of switch-reference in North America exhibits clustering in two areas, centred on the South West and Great Basin culture areas, and on coastal Northern California; the larger Northern and Eastern areas lack it. Languages central to these clusters also have a greater 'commitment' to switch-reference than more peripheral languages, for example in the number of pairs of switch-reference morphemes they have and the range of syntactic environments these may be used in. See Jacobsen (1983:172f.). Similarly, Austin (1980, 1981) has described the areal diffusion of switch-reference across diverse languages in Australia. Outside the four geographical areas mentioned above, only isolated and qualified reports of switch-reference systems have been made. For example, Nichols (1983:esp.245) describes switch-reference like systems in some language families of the Northeast Caucasus.²

From the extensive literature on switch-reference one can distil an idea of the canonical switch-reference system, as one which meets the following formal and functional conditions.

(1) The Locality Condition

The switch-reference relation holds between just two clauses. The relation between the marked and the controlling clause is a local one, i.e. the clauses are linearly adjacent.

² Some investigators have focussed on the formal and functional similarities between switch-reference and other grammatical phenomena, for example Givón (1983) argues that that switch-reference is just one manifestation of a general reference-tracking function while Haiman (1983) compares it to coordinate reduction in other languages. Such perspectives have led to occasional suggestions that 'switch-reference systems' can be found in some Indo-European languages like Persian, Latin and Ancient Greek, as well as in Turkish (eg. see Haiman & Munro 1983b:x,xiv; Haiman 1983).

(2) The Dependency Condition

The marked clause is syntactically and semantically dependent on the controlling clause. Either the marked clause is subordinate to the controlling clause or marked and controlling clauses are in a clause chaining construction. In a clause chaining construction a string of 'dependent' medial clauses is followed by a final 'independent' clause. The medial clauses are typically marked for switch-reference but lack some or all of the verbal inflection characteristic of independent clauses, such as tense, mood, agreement etc. The final clause is not marked for switch-reference but does have finite verb inflection, and this is assumed to apply to the entire clause chain.

(3) The Realisation Condition

Switch-reference is marked by contrastive suffixation on the verb of the dependent clause. The order of the two clauses is marked followed by controlling.

(4) The Subject Condition

Let us introduce the term **switch-reference pivot** for the two NPs which are related by switch-reference marking. The switch-reference pivots are the surface syntactic subjects of the marked and controlling clauses. Even in languages with some degree of ergativity, the pivots seem to be Nominative-Accusative subjects (Austin 1980:27,36-7; T. Payne 1980:67).

(5) The Functional Condition

Switch-reference functions to signal obligatory co/disjoint reference between the pivot NPs.

An abstraction with this profile, or one very similar, seems to have considerable psychological reality for researchers working on switch-reference, whether they are engaged in describing a particular language, giving a typological survey of the phenomenon or attempting to develop a formal account for switch-reference. For example, Givón (1983) opens with the statement: 'What I propose to do in this paper may displease some *aficionados* of the traditional view of switch-reference' (p.51), and concludes by saying: 'the narrow "canonical" definition of switch-reference [...] has severe pitfalls attached to it' (p.79). Many other researchers make very clear statements about 'canonical', 'classical', 'real' or 'true' switch-reference; for example see Jacobsen (1983:151), Haiman & Munro (1983b:ix); Nichols (1983:259) and Munro (1980b:2). They may also identify 'non-canonical' systems, and may note, like Heath (1983:130) that 'sporadic departures from this norm' will be disregarded.³

³ I should point out that in the typological literature there has been a fair amount of concern over where the limits of switch-reference phenomena lie. Not all researchers would agree with the conditions listed above, given that all of them abstract away from exceptions.

It is obviously in the nature of an abstraction to have exceptions, and it is therefore unsurprising that the canonical definition presented above reveals just a fraction of the wealth of data and range of instances of which it is claimed to be representative. Some of the diversity in switch-reference systems is due to the interaction of an underlying functional phenomenon with language specific choices in areas such as constituent order, and this will be discussed in more detail in section 1.4. However, there are important ways in which the particular abstraction with which many researchers appear to be working fails to represent the data adequately, which we shall consider in sections 1.4 and 1.5. These have significant implications for any general theoretical account.

In illustration, Finer's (1985a, b) 'formal grammar of switch-reference' is based on a very restrictive notion of switch-reference which is readily shown to be unrepresentative. Before proceeding I will briefly consider his account, which is formulated within Government and Binding Theory (Chomsky 1981), specifically that version of GB proposed by Aoun (1981, 1985, 1986), and called 'Generalised Binding'.⁴ Finer's account is open to a number of criticisms for the unjustified assumptions it makes about switch-reference languages. Some of these criticisms are general ones which stem from his acceptance of the canonical view of switch-reference, and these will be of most concern to us here; others are specific criticisms which may be subject to correction within the GB framework and which I shall have little to say about. For other critiques of the account see Tsujimura (1987) and Roberts (1988).

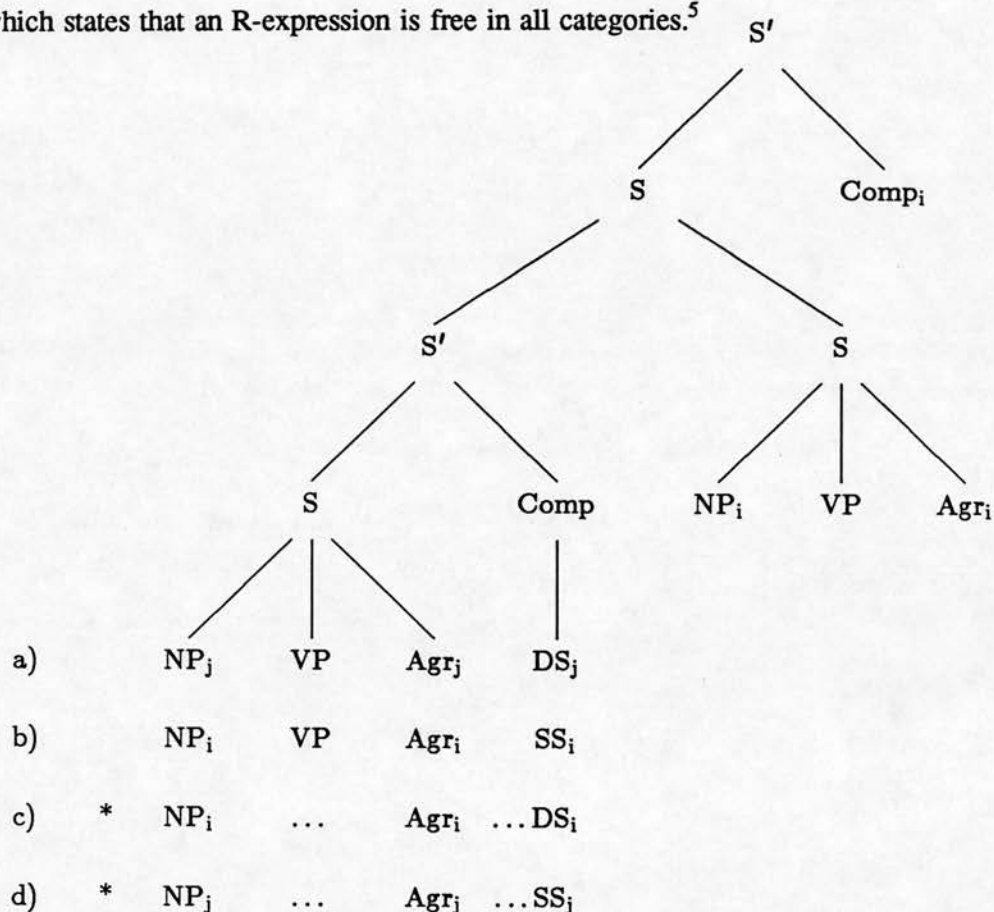
In brief, Finer assumes that switch-reference is a syntactic phenomenon, to be accounted for by the Binding Theory at the level of S-structure. He assumes a canonical notion of switch-reference identical to that defined above, except that he adopts an even more constrained version of the Dependency Condition, which we shall refer to as the **Hierarchical Adjunction Condition**: the syntactic relationship between the two clauses is restricted to hierarchical adjunction, i.e. it is a subordination relationship and complementation, coordination and intersentential relationships are excluded.

Canonical switch-reference is superficially similar to other syntactic binding relations, such as those between reflexive pronouns and their antecedents, in its conformity to the Locality, Hierarchical Adjunction, and Functional Conditions. However, it differs from them in that the relation of c-command does not necessarily obtain between the NPs in a switch-

⁴ Finer (1985b:53,n.17) also suggests that a generalised binding account may work for logophoric systems.

reference relation. This is illustrated in (4), where an R-expression like *Joan* in the most deeply embedded NP might be set equal by a SS marker to the NP in the matrix clause; if the two were in a c-command relation this would violate Principle C of the Binding Theory, which states that an R-expression is free in all categories.⁵

(4)



In consequence, the referential possibilities allowed for by switch-reference must be accounted for indirectly. To solve this problem Finer follows Aoun (1981, 1985, 1986) in postulating a generalised binding theory which allows the extension of the Binding Principles to A' (nonargument) positions; he also needs to assume transitivity of indexing between COMP and INFL/AGR. (4) is the structure Finer considers most plausible for switch-reference examples; note that it has a subordinate marked clause embedded within a matrix controlling clause. He includes a VP node, but notes that this may not be appropriate for some of the languages in question, although he claims it would not affect his account (see Finer 1985b:44,n.10; but on p.52,n.16 he seems to acknowledge that it would make a difference).

⁵ C-command is a structural relation defined on tree geometry. The definition of it which Finer (1985b:48) assumes, from Belletti & Rizzi (1981:145), states that α c-commands β iff neither α nor β dominates the other, and the first maximal projection dominating α dominates β . Normally, two conditions must be met before it can be said that an element α binds an element β : α must c-command β and α and β must be coindexed.

On this account, SS and DS are abstract operators which occupy COMP, i.e. they do not have morphological realisation; they are attached to the verb in the same way that elements in AGR are normally assumed to be cliticised to the verb at the level of Phonological Form. SS is an A'-anaphor and DS an A'-pronominal. The reason given for choosing to place SS and DS under COMP, out of several possible analyses, is that as we shall see below switch-reference morphemes often mark additional meaning such as temporal and logical relations between the clauses.

Finer claims that a subordinating morpheme found in COMP forms a discontinuous constituent with INFL/AGR: equivalently, COMP and INFL/AGR are joint head of the S'. The governing category for SS and DS will be the matrix clause; the superordinate S'. This is possible because Finer does not allow S to be a maximal projection. The governing category must contain the element in question, a governor of it, which is the COMP_INFL/AGR of the matrix clause, and a SUBJECT accessible to it, which is the AGR of the matrix clause, on the assumption that AGR may count as a SUBJECT.⁶

Now for the transitivity of indexing relation. AGR (along with TENSE) is a realisation of INFL, the inflectional component of the sentence; it is an empty pronominal governing the subject NP and assigning case to it, and as in most formulations of GB, its presence is dependent upon the presence of TENSE. Agreement between subject and verb is handled by a rule which coindexes AGR and the subject NP, this coindexation to be interpreted as constraining the two to be compatible in the relevant features of person, number etc. Since AGR indexes the [NP,S], and since, given the relation between AGR and COMP, these two share indices, then COMP and [NP,S] share indices.

SS is an A' anaphor which means that it must be bound in its governing category by an item in an A' position. It will be bound by the upper COMP and thus indirectly bound to the upper subject NP indexed *i*. The DS A'-pronominal must be free in this governing category; thus it is explicitly NOT bound to this NP.

⁶ The notion of government assumed (Finer 1985b:48) is that defined by Belletti & Rizzi (1981:123):

α governs γ in a configuration like $[_\beta \dots \gamma \dots \alpha \dots \gamma]$ where:

- (a) $\alpha = X^0$ (= a lexical element),
- (b) where ϕ is a maximal projection, if ϕ dominates γ , then either ϕ dominates α , or ϕ is the maximal projection of γ ,
- (c) α c-commands γ .

There are certain difficulties of a technical nature for this account. If AGR is possible only when TENSE is present, and this account of switch-reference relies on transitivity of indexing from COMP to the NP via AGR, then the account will run into difficulties in many switch-reference languages, since switch-reference marking is normally incompatible with tense marking. Problems will also arise in languages where the value of [NP,S] and AGR cannot be identical due to the presence of object agreement marking on the verb as well as subject agreement marking, or due to complicated subject-verb agreement facts, such as occur in Hopi (see Tsujimura 1987:17). Also, Finer argues that the SR markers are part of COMP, but really there seems to be no good reason for this (see Roberts 1988:47, Tsujimura 1987:14 for some discussion). Finally, it is not clear that the switch-reference morphemes are best analysed as attached to any node in a phrase structure tree; such an analysis is particularly problematic for languages with multiple or discontinuous switch-reference marking, such as Kashaya (Oswalt 1983) and Amele (Roberts 1987); see Tsujimura (1987:24) for relevant discussion.

However, these are minor problems compared with the fact that many of the assumptions which Finer makes about switch-reference turn out not to be generally true. In this thesis I argue that whereas if one takes the canonical definition of switch-reference, it seems promising to account for switch-reference as syntactic binding, in fact switch-reference cannot be handled this way, because the canonical definition crucially misrepresents what has to be accounted for.

1.3. Violation of categorial iconicity

Because switch-reference has the formal property of being marked on the verb, but the functional property of tracking the reference of NPs in the clause, it is said to involve a violation of the **Principle of Categorial Iconicity**, whereby a distinction is normally marked on the category to which it applies semantically (Haiman 1983, 1985; Haiman & Munro 1983b:ix). The crucial assumption here is that the category to which switch-reference marking applies semantically is that of the pivot NP.

It is this combination of formal and functional characteristics, which for many researchers makes switch-reference 'exotic' (Haiman & Munro 1983b:ix-x; Finer 1985b:35) or 'weird' (Haiman 1983:105). This is also for many the individuating or defining criterion for switch-reference, which distinguishes it from other formal devices with similar reference tracking functions. On this view, then, there is a natural class of functions concerned with

tracking the reference of NPs, and these may be realised formally in a variety of different fashions, depending upon particular synchronic and diachronic characteristics of the language. The implication is that the function performed by a switch-reference system might just as well have been performed by a reference tracking device marked on the NPs themselves, in fact such a situation would be more 'normal'. Even Givón (1983), who does not accept the primacy of structural characteristics in distinguishing switch-reference as a separate and identifiable phenomenon, still maintains the view that functionally, it is not interestingly different from other referential tracking systems. Of course, this view is formally encoded in Finer's grammar of switch-reference, where switch-reference is a binding relation between NPs which just happens to be mediated by other elements of the clause. Finer has to assume that switch-reference information starts off in the ultimately unrealised constituent of COMP, which allows the syntactic/semantic information encoded by switch-reference to transitively percolate through onto the subject nominals of the clauses, while the phonological information ends up appearing on the verb.

Without denying that the reference tracking function of switch-reference systems is primary, I wish to make two points about these ideas. Rather than seeing switch-reference as a way of getting certain indexing relations on NPs, I propose that we see it as saying something about the clause via saying something about the verb.

First, I will show that the claim that switch-reference violates categorial iconicity and is therefore weird, is a fundamentally misguided one. There are two parts to the argument.⁷ First, suppose we accept the premise that switch-reference marking semantically applies to the pivot NPs in the related clauses. There is a well-motivated typological distinction between head-marking and dependent-marking morphology, such that any grammatical relation between a head constituent and one of its dependents may be marked on either (Nichols 1986). Some grammatical processes are biased crosslinguistically towards one type of marking, for example the relationship between subordinate and matrix clauses is normally marked on the subordinate clause. But for most processes, which kind of marking occurs depends, crudely, on whether the language has chosen the head-marking or dependent-marking option. Switch-reference languages tend to be head-marking, with complex verb morphology. They also tend to be 'pro-drop' or 'null anaphora' languages, where due to a rich verbal agreement system, subject NPs and often other NPs are freely

⁷ Although Haiman (1983) makes this claim most explicitly, he does try to reconcile switch-reference phenomena with the iconic tendency by showing that switch-reference is historically an outgrowth of 'familiar' linguistic processes.

omissible (Hale 1983:7). The fact that referential relations which hold of an argument of the verb are marked on the verb itself seems to be an unsurprising consequence of these typological choices. The second part of the argument challenges the assumption that switch-reference marking is semantically in the domain of the pivot NPs, and claims instead that its semantic domain is that of the clause. Further development of this argument must wait until some of the functional complexity of switch-reference systems has been explored.

The second point I wish to make concerns this functional complexity. In this chapter and the next I will show that, whatever the historical origins of switch-reference systems are, synchronically they often exhibit a functional complexity which is very similar across switch-reference languages, regardless of what area of the world they come from, and which appears to be related to the fact that they are marked on the verb.

In summary, I take the position that the fact that switch-reference marking occurs on the verb, or at least not on the pivot NP, is indeed criterial to distinguishing switch-reference systems from other reference tracking systems, but that this does not make switch-reference weird: rather, the formal realisation of switch-reference marking is in fact intimately connected with the range of functions which switch-reference systems encode. I shall show that the Functional Condition defined above is inadequate as a characterisation of the functions of switch-reference, and I shall argue that a more adequate characterisation, if taken seriously, will lead us to revise our ideas about how switch-reference should be accounted for theoretically.⁸

In section 1.4, I give a condensed but relatively comprehensive tour of the formal complexity of switch-reference systems. This section has two aims. One is to bring out the importance of typological characteristics of the language for the shape of the switch-reference system. The other is to show that the formal conditions on canonical switch-reference misrepresent the data in important ways, and that Finer's account is thus

⁸ It is a question for further work, within a framework more strictly concerned with Universal Grammar and language typology, to consider whether it is some other typological characteristic of these languages which leads them to mark switch-reference on the verb. If switch-reference is just a particular device, determined by other characteristics of the language, to fulfill the ordinary function of referential tracking, one would expect to find some such explanation for it being marked on the verb, although such an explanation would not be inconsistent synchronically with there being a functional pay-off from this marking. Likely typological characteristics might include constituent order, head-/dependency-marking and pro-drop/null anaphora characteristics, or Capell's (1965, 1969) distinction between event and object orientation in languages. Jacobsen (1983:173) suggests that all languages have the potential to develop switch-reference, although he also hints that there may be structural prerequisites which need to be satisfied before this is possible.

inadequate as a comprehensive theory of switch-reference. Exceptions to the Realisation Condition are relatively unimportant and are a function of other typological characteristics of the language. However, the Locality Condition, although correct for many switch-reference languages, is not generally correct, and as is already obvious, the Hierarchical Adjunction Condition has only very limited applicability: thus, switch-reference relations do not seem to be candidates for a syntactic binding account based on configurational notions of binding. Finally, the Subject Condition is also wrong for many languages, in two major respects: non-subject NPs as well as subjects may be pivots in some languages, and in many switch-reference languages, a notion of agentivity is criterial in defining switch-reference pivots.

In section 1.5, I review the functional complexity of switch-reference systems and show that the Functional Condition is too simple. This is important not just in what it tells us about how we should regard switch-reference; it also indicates once again that a binding account is inadequate, and indeed that any theoretical description which fails to take account of non-referential functions of switch-reference systems is descriptively inadequate.

Finally, in section 1.6 I consider two other types of phenomena which have been likened to switch-reference - obviation and logophoricity.

1.4. The formal complexity of switch-reference systems

Dependency relations between marked and controlling clauses

Even from the little which has been said about switch-reference so far, it is clear that the strict form of the Dependency Condition subscribed to by Finer - the Hierarchical Adjunction Condition - cannot be true. I said in 1.2 that the two canonical types of syntactic relation which occur between marked and controlling clauses are the relation of hierarchical adjunction which holds between a subordinate adverbial clause and its matrix clause, and the dependency relation which holds between clauses in a clause chain. (1) and (2) above are examples of the adverbial type and the clause chaining type respectively. The first type is pervasive in the languages of North America, and the second type is pervasive in the languages of Papua New Guinea, although both types occur in languages from other areas as well (eg. Longacre 1983 discusses a South American clause chaining language and Nichols 1983:245 shows that chaining occurs in languages of the Northeast

Caucasus).

Clause chaining languages tend to be verb final. The relation between clauses in a clause chain is usually assimilated to the relation between overtly coordinated clauses in languages such as English, and sometimes is compared to the relationship between separate sentences in a paragraph. Clause chains may be very long (up to 20 clauses per chain are noted by Davies 1981 and Roberts 1987, 1988). The question of whether the relationship should be assimilated to coordination or subordination, or distinguished from either, is discussed in some detail in chapter 5, where I conclude that the dependency of the medial clauses on a final clause for tense and other verbal inflection distinguishes them from coordinated clauses, and propose that they should be seen as fitting somewhere between subordinate and coordinate clauses in the taxonomy. Whatever they are, it is clear that they are not in a relation of hierarchical adjunction. The following example of a clause chain construction is from Amele (Roberts 1987:101).

- (5)
- | | | | | | |
|----------------|----------------|------------------|---------|-------|-----------------|
| ija | Malolo | uqa | na | ka | |
| 1s | Malolo | 3s | of_POSS | car | |
| jic | ana-g | | na | ono | nu |
| road | mother-3s_POSS | | at | there | for |
| sum-ud-i | | bi-biligin | | | ne-ce-b |
| wait-3s-PRED | | SIM-be-DUR_1s_DS | | | come_down-DS-3s |
| tobo-co-min | | belo-w-an | | | |
| climb_up-DS-1s | | go-1d-YestP | | | |

While I waited for Malolo's car there at the main road, he came down,
I climbed in, we two went off. [101, (Text 7); 238, (396); 297, (583)]

Apart from subordinate adverbial clause constructions and clause chaining constructions, switch-reference systems may relate clauses in a wide range of different construction types. As well as other kinds of subordinate clauses such as relative clauses and complement clauses, switch-reference may mark overtly coordinated or paratactically related clauses. Switch-reference in American Indian languages tends to mark adverbial subordinate clauses: often this is the only kind of switch-reference marking which occurs, and it is almost always possible whatever other types occur. However Jacobsen (1983:167,170-1) shows that all the other possibilities listed also occur in some North American language. He suggests (p.171) that we should recognise two broad categories of (American Indian) languages with switch-reference: those showing only, or primarily the adverbial clause type, and those marking also paratactic and other clause types. The latter most clearly

include Muskogean, Yuman, Washo, and perhaps Hopi, which interestingly are also languages with fully isolable switch-reference markers (see below). In the literature a distinction is rarely made between coordinate and chaining constructions: for a variety of languages in which switch-reference is marked exclusively in these kinds of constructions see Franklin (1983), Haiman (1983), Longacre (1983) and Lynch (1983), and for some in which it is marked over both coordinate and subordinate clause boundaries see Munro (1983). Clear cases of switch-reference in coordinate constructions which are not clause chains are noted by Gordon (1983:98) for Maricopa and Austin (1980:26-7) for Pitjantjatjara and other dialects of the Australian Western Desert language. In the latter, switch-reference is marked by independent morphemes which also encode the conjunctive element of meaning. See example (6).

- (6)
- | | | | | |
|-------------|------------------|----------|---------|-----------|
| palunyalu | junku | junku | nyangka | nyuma |
| and-SS | put-FUT | put-FUT | and-DS | cake-ABS |
| purikarriku | ka | paalku | ka | jilka |
| become | and-DS | cook-FUT | and-DS | child-ABS |
| ngamu | ngarranyjamaalpa | | | |
| near | not_stand | | | |
- and (they) would put (it) out and the cake would spread and they would cook (it) and the children would not stand by.

The formal complexity of some languages with switch-reference marking is attributable to the fact that separate sets of switch-reference morphemes may occur for different kinds of clause relation. Thus in Choctaw and Chickasaw (see Jacobsen 1983:167, Munro 1983:223), there is one system of endings for paratactic clause combinations, and another used in adverbial, complement and relative clause constructions. Similarly, different endings may be used for different types of subordinate clauses, as in Hopi, where there is one system for adverbial clauses and another for relative clauses (Jacobsen 1983:167).

The only likely candidate for a truly universal restriction on the relationship between the two clauses is that the controlling clause is never syntactically subordinate to (or more generally, dependent upon) the marked clause. Haiman & Munro (1983b: xii) say: 'we have no explanation for this puzzling restriction, which is anomalous in both functional and structural terms' (functionally anomalous, because subordinate clauses tend to be used to establish or restate the givens in a discourse, and so, they say, would be ideal controlling

clauses; and structurally anomalous, because while reflexivisation satisfies the same restriction, there is a structural explanation for it in terms of the principle of strict cyclicity, a principle which cannot apply to clauses in a switch-reference relation). However, if Roberts (1988:46,59) is correct, Amele switch-reference does mark a superordinate clause with respect to a subordinate clause in one construction type.

If one takes a finite verb to be a necessary and sufficient requirement for sentencehood, one might assume that clause chains constitute single sentences. This is not an uncontroversial assumption: see Longacre (1972) for the claim that while subchains occur which correspond to sentences, clause chains which encode sizeable discourse level chunks are better seen as paragraphs. However, if we do make this assumption, switch-reference does not appear to cross sentence boundaries. Rather, the widespread device of the **recapitulation clause** allows the switch-reference marking to be carried over from one sentence to the next. In these cases the first clause in a new sentence is a recapitulation of the final clause in the previous sentence, and is marked for switch-reference in such a way as to connect the final clause of the previous sentence to the first full clause in the new sentence. Recapitulation clauses may simply repeat the final verb of the previous sentence, or they may contain what is sometimes called a 'utility verb'; some special reduced form which stands instead of the previous full verb and which is usually based on a verb 'to be' or 'to do'. In some languages the recapitulation device is so pervasive that it does not just connect sentences, but connects individual dependent clauses within a clause chain - this happens in Kewa (Franklin 1983).⁹ Example (7) is from Amele (Roberts 1987:89); the recapitulation clause is in bold type.

⁹ 'Dummy' recapitulation clauses are also sometimes referred to as 'anaphoric particles', a term introduced by Hoiijer (1949) and adopted by Jacobsen (1983) among others. Jacobsen states that 13 out of 33 North American switch-reference languages have such dummy clauses, and notes (p.169): 'This is a useful device because otherwise speaking one of these languages demands an unwonted amount of foresight, as one must think ahead regarding whether or not the next clause will contain the same subject before completing the clause at hand. These particles will allow one to stop, and then, especially if one has not foreseen a switch of subject, to start up again.'

(7)	Sain time	leih some	dana man	age 3p	jo house	eundec that_kind
	ben big	ca with	cehe-gi-na. build-3p-Pres	Od-i-me-ig do-PRED-SS-3p	cuamu room	ijed three
	o or	wal four	oso INDEF	eu that	odi like	gahe-gi-ne. break-3p-Pres

Sometimes the men make one of those houses bigger. They divide it into three or four rooms. [89, (418)]

Finer (1985a:ch.V) does give a tentative and inconclusive discussion of switch-reference in complement clauses and in coordinate structures in a section on 'residual problems' for his analysis. Coordination is a relatively intractable problem for an analysis in terms of syntactic binding, and Finer concludes that for that some types of switch-reference constructions, linguistic principles other than binding may be involved, although he does not identify these.

Violation of the Locality Condition

Although there are no languages in which switch-reference is exclusively marked between non-adjacent clauses, there are two important types of case which violate the Locality Condition.

The first type is relatively trivial. A phenomenon described as 'clause-skipping' occurs in some switch-reference languages. This term has been used for a number of different kinds of phenomena, but most commonly clause-skipping happens when switch-reference relations are restricted to hold between clauses in a particular syntactic relationship. If a clause at a different grammatical level intervenes in the linear string between the two clauses in the switch-reference relation, then the switch-reference marking will appear to 'skip over' the intervening clause to mark the true controlling clause. For example, in Amele (Roberts 1987, 1988), a language which will be considered in more detail in chapters 2 and 5, switch-reference relations hold between clauses in a clause chaining construction and (with one or two possible exceptions) do not hold between matrix and subordinate clauses. Subordinate clauses normally precede their matrix verb in the clause, so that if a controlling clause contains a subordinate clause, the switch-reference marking on the preceding clause in the clause chain clause will appear to 'skip' it, i.e. the SS or DS marking will not relate to its subject but to the subject of the next clause on the same

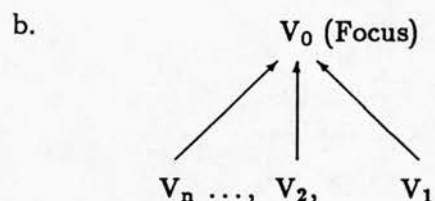
grammatical level as the marked clause. Subordinate structures may themselves be complex and include switch-reference relations, making for a rather complex linear structure. Examples of clause-skipping in Amele will be discussed in chapter 5.

There is some indication that the important difference between clauses marked by switch-reference and clauses skipped over in clause chaining languages has to do with the temporal structure of the discourse. The switch-reference marking on medial clauses in clause chaining languages of this kind normally indicates in addition whether the temporal relationship between the **eventualities** (in the sense of Bach 1981) introduced by the clauses is one of sequentiality or simultaneity. The eventualities introduced by subordinated clauses are not normally part of the temporal sequence in this way, and are more likely to represent 'background' eventualities related to the others by logical or causal relations (see Hopper & Thompson 1980 for the 'foreground'/'background' distinction). Thus, Franklin (1983:41,44-45) describes clause-skipping in Kewa as occurring when the clause chain is interrupted by a 'subordinating' particle specifying some distinct interclausal relation such as reason-result, thesis-antithesis or cause-effect. In the example he gives (his example 16) a clause whose subject is different from the other clauses in the chain is skipped over by switch-reference marking because use of the subordinating marker *rabu* 'time' indicates that it has been 'shifted off the time line'.

The description 'clause-skipping' has been misleadingly applied to another type of phenomena which will be mentioned in 1.5 and discussed in some detail in chapter 2; i.e. cases where the controlling clause is an impersonal construction and SS marking is used regardless of the referential relation between the two pivots.

In the second type of violation of the Locality Condition, the switch-reference relation does not mark each clause with respect to the adjacent clause in the sentence, but rather marks each clause in a sequence with respect to a **focus clause** which is usually the final clause in the sentence. This happens in Kashaya, and it was work on this language which led Oswalt (1983) to make a distinction between two kinds of switch-reference marking, **sequential** and **focused**. Sequential marking is the kind described above and is illustrated in figure (8a); focused marking is illustrated in figure (8b). The different results produced by the two systems for the same sequence of clauses are shown in figure (9), where subscripted 'o' marks the main verb. These diagrams are based on Oswalt (1983:277-8).

(8) a. $V_n \dots \rightarrow V_2 \rightarrow V_1 \rightarrow V_0$



(9)

	NP_i	NP_j	NP_j	NP_i	NP_i
Sequential:	V_4DS	V_3SS	V_2DS	V_1SS	V_0
Focal:	V_4SS	V_3DS	V_2DS	V_1SS	V_0

In sequential marking, a marker for switch or retention links each adjacent clause. In focal marking, each subordinate clause is checked against one focal main clause, rather than a neighbouring clause. Oswalt (1983:279f.) gives convincing arguments that Kashaya exhibits focused marking. As he notes, as a result, it is more common than not that successive clauses marked with DS suffixes actually share the same pivot. The domain of the focused marking in Kashaya is the entire sentence, but nested focal domains may occur, eg. with quotation, and in such cases clause skipping of ^{the} kind described above occurs. Recapitulation clauses are anaphorically related to the focal clause of the previous sentence, whether or not it is the final clause. Example (10) illustrates focused switch-reference marking in Kashaya (Oswalt 1983:279).

- (10) Mensiwem mu saqaac-ed-em, maʔu ʔul tubiyiic-ed-em,
 then that wear-DUR-DS, now then start_out-DUR-DS,

 mu sihta-ʔem ʔamaatii sihta cahnoc-iid-u
 that bird-SBJ kind all bird

Then, whenever he put on [his feather coat], and then started out, the
 bird - all kinds of birds - would sing out.

Here, the first two verbs are both marked with the DS morpheme, despite the fact that their pivot NPs are coreferential, because both have pivots disjoint in reference from that of the final focal clause.

It is possible that this type of switch-reference marking is actually just one manifestation of the kind of clause-skipping described at the beginning of this section, that is we could argue that each of the marked clauses is actually subordinate to the final clause and so is properly marked with respect to it. Then clause-skipping would involve either a symmetry of first and second marked clauses both of which seem to look forward to the same controlling clause, or subordination of a second marked clause, which is thereby shifted off the grammatical level on which a first and third clause are joined. In either case, the type of example given in Kashaya would seem to present problems for the account proposed by Finer.

Realisation and constituent ordering

I noted in 1.2 that in the majority of languages switch-reference marking is by suffixation on a dependent clause which precedes the controlling clause. This is a function of the constituent ordering characteristics of switch-reference languages, which tend to be OV, and usually SOV. Implicational universal tendencies are such that languages with this pattern of clausal constituent ordering will tend to prefer suffixation to prefixation and will generally order modifiers before heads. Unsurprisingly, when switch-reference occurs in a language which does not have (S)OV word order, the ordering characteristics of the switch-reference marking also alter. Thus, the Austronesian language Lenakel, which we shall consider in more detail in chapter 2, has SVO constituent ordering, and switch-reference marking is by prefixation with the marked clause following the controlling clause (Lynch 1983).

The further typological generalisation has been proposed by Haiman & Munro (1983b:

xiif.), that there is an interaction between constituent order and the type of syntactic relationship between the clauses. The claim is that where the relationship is one of subordination, potentially either order may occur, regardless of the other constituent ordering characteristics of the language - although in fact the most likely order is that the marked clause precede the controlling clause. Where the relationship is one of coordination - which for these authors is mainly clause chaining relations - the order is not free but is tied to the order of affixation, and thus to constituent order more generally. If the marking is by suffixation, the marked clause precedes the controlling clause, and if it is by prefixation, vice versa. There is considerable support for the second part of this generalisation in Austronesian and Non-Austronesian languages, cf. Haiman (1983:106) and Lynch (1983). There is also considerable evidence for the first part of the generalisation. In most North American languages (Gordon 1983, Comrie 1983, Oswalt 1983) the marked subordinate clause precedes the controlling clause. In most Australian languages (Austin 1981) it follows it.

In some languages where the relation between the clauses is one of subordination, both orders may occur. The order may vary freely, as in Chickasaw (Munro 1983) and Kashaya (Oswalt 1983), or it may be dependent upon syntactic and semantic factors, as in Imbabura Quechua (Cole 1983), which has two switch-reference systems, with marked adverbial clauses of time etc. preceding the superordinate controlling clause, and marked subjunctive noun clauses of purpose etc. following their superordinate controlling clause. A particularly good example of a language in which the linear order of the two clauses is tied to syntactic and semantic factors is Maricopa.

In Maricopa (Gordon 1983), three classes of marked subordinate clauses occur distinguished on the basis of their syntactic and semantic relationship to the controlling clause, and the linear order of the two clauses depends on which class of relationship they are in.

The first and most basic class of marked clause must precede the controlling clause and expresses a relationship of temporal ordering or loose conjunction of the eventualities described in the clauses. The second class can be ordered either before or centre-embedded in the controlling clause, and in this case the marked clause either serves as a core or peripheral argument of the controlling clause, or modifies one of its constituents. Finally, there is a class of marked clauses which can be ordered either before, centre-embedded in or after the controlling clause, and which are used to express the reason or cause for the eventuality expressed in the controlling clause. All these types of clause take

the same set of switch-reference markers, and there is no special indication of their semantic or syntactic relationship, other than the ordering constraints.

Again, switch-reference marking in Maricopa is with respect to the matrix clause, regardless of linear order. This results in seeming aberrations as clauses may be 'skipped over' by the switch-reference system. Thus in example (11) (Gordon 1983: 93), the first clause expresses a relationship of temporal ordering and must precede its controlling clause, which is the final clause of the sentence; between these two is a clause of reason and both subordinate clauses are marked with respect to the final clause.

- (11) 'iipaa-ny-sh nya-vaa-k 'ayuu '-rav-m ny-wik-k
 man-DEM-SBJ when-come-SS INDEF 1-hurt-DS 3/1-help-ASP
 When the man_i came, he_i helped me because I was sick.

Violation of the Subject Condition

Two kinds of violation of the Subject Condition occur, and both present problems for Finer's account and also place additional requirements upon the kind of syntactic account we should give for switch-reference.¹⁰

First, in some languages NPs in other grammatical relations appear to be involved in the switch-reference system in addition to subjects. For example, Warlpiri (Simpson 1983) has a complex system in which objects as well as subjects of the controlling clause may be related by the switch-reference morphemes to the subject of the following marked infinitival clause. The four morphemes with their meanings are given in (12).¹¹

- (12) (i) *karra*: the subject of the marked infinitival clause is coreferential with the

¹⁰ It is usually assumed that for any particular language judgements about subjecthood can be made on the basis of independent syntactic criteria. It is important that this should be possible in switch-reference languages because often in these languages control of switch-reference itself is used by researchers as an indicator of subjecthood. Sometimes identification of subject is straightforward, as in Maricopa (Gordon 1983:84), where the subject is marked with the case suffix *-sh* and the verb agrees with it in person and optionally in number, and also agrees with the object. But sometimes difficulties arise with the definition of subject in some of the languages considered, and these will be mentioned where relevant.

¹¹ The Warlpiri system has been described as an obviation system and analysed in terms of syntactic control. See Simpson & Bresnan (1983). It would clearly be of interest to investigate the relationship between switch-reference marking and control phenomena, but such an investigation lies outside the scope of this thesis.

subject of the controlling matrix clause.

(ii) *kurra*: the subject of the marked clause is coreferential with the object of the controlling clause.

(iii) *rlajinta*: the subject of the marked clause is coreferential with that of the controlling clause, and the event described by the controlling clause is an 'accidental' consequence of the event described by the marked clause.

(iv) *rlarni*: the subject of the marked clause, if non-overt, is the same as the oblique dative argument of the controlling clause.

Similarly, Jacobsen (1967:256-7) notes that the North American language Capanahua has six DS suffixes, two of which imply the identity of the subject of the marked clause with the object of the controlling clause, and one of which implies the identity of the object of the marked clause with the subject of the controlling clause.

In other languages the pivot NP in one of the two clauses is allowed to bear any grammatical relation; it is only important that the pivot NP in the other clause be subject. This happens in Yup'ik Eskimo (Woodbury 1983), where any NP in the controlling clause may be distinguished by the switch-reference system. It is also noted for Gokana (Comrie 1983), where any NP in the marked clause may be the switch-reference pivot - subject, object, or even a possessive adjunct of an argument of the verb (i.e. having no grammatical relation of its own to the verb) - and the pivot in the controlling clause may be a non-subject NP provided that it has the thematic role of 'source'. However, as we shall see in 1.6, it is not uncontroversial that the Gokana system does represent switch-reference, rather than logophoricity.

The second type of violation of the Subject Condition is where a notion of agentivity is implicated in the definition of the switch-reference pivot for the language. This will be discussed in some detail in chapter 2. Essentially, in many languages, it is not simply syntactic subjects which are related by the switch-reference system, but **agentive** syntactic subjects: this is indicated by the fact that when the controlling clause is an impersonal construction which lacks an agentive subject, the switch-reference marking is SS regardless of the fact that there is no coreference between arguments of the two clauses. The switch-reference system thus uses DS marking for a new agentive subject, and SS marking to indicate that no new agentive subject has been introduced. Nichols (1983:247) notes a related phenomenon in the languages of the Northeast Caucasus. Here, the switch-reference pivot seems to be identified as the 'most subject-like' NP on the basis of topicality, animacy, agentivity, affectedness etc. rather than on the basis of surface syntactic relations or morphological case.

In some languages, it seems that switch-reference may even be a relation between agents *per se*, rather than agentive syntactic subjects. This may be taken as a claim that the switch-reference pivot is semantically defined in such languages (eg. see Roberts 1987), or it may be assumed that a syntactically defined notion of agent is involved (eg. see Oswalt 1983). It is hard to find clear examples of this type however. This suggestion has been made for Eastern Pomo by Foley & Van Valin (1984:119ff.,345) and for Amele by Roberts (1987:292), but I shall show in chapters 2 and 5 that in each case although agentivity is implicated, the pivot must be defined as syntactic subject with additional thematic constraints. A more likely candidate is Kashaya, a language related to Eastern Pomo. Oswalt (1983) claims that its switch-reference system is best described as indicating relations of coagency or disagency. Again it is not clear whether this is the best analysis. It relies upon assuming that agents which are unexpressed throughout long stretches of text are nevertheless somehow 'present', and that it is these which trigger switch-reference marking. Evidence for this is that in at least some cases, verbs apparently agree with these unexpressed agents rather than with subject-marked nominals. It is also possible that Kaingáng provides an example: Wieseemann (1982: 45) reports that grammatically the subordinate clause in this language cannot have a subject, just an agent encoded in an instrumental PP; it is this which is the switch-reference pivot. Although this observation must be explained, it is not clear that the notion of agent is more helpful here than, for example, a notion of deep subject.

Finally, it is sometimes said that switch-reference pivots should be defined as topic NPs, rather than as subjects or agents. Normally a pragmatic notion of topic seems to be assumed here. Givón (1983) takes a theoretical stance on this point. He says (p.68): 'Traditionally, the term switch-reference has been applied almost exclusively to *subject-switch* [...] There is nothing wrong with this traditional practice *per se*, since the main vehicle of topic continuity in language is indeed the subject'. But, he says, it is better to take as a basic starting point the more general notion of topic. Thus he treats switch-reference as a device for indicating topic continuity or discontinuity. Once again, it is hard to find a clear cut example of a language in which the pivots are topics rather than subjects, although clearly there are close and well-established links between the two. We are reminded of this by switch-reference marking Bantu languages such as Noni and Bafut (Wieseemann 1982), where the distinction between SS and DS marking is realised partly by different tone patterns, with the pattern for DS marking predictably being the tone for focalised forms while the SS morpheme has consecutive tonal marking.

Finally, as Heath (1983:131) points out, we must consider the role of switch-reference

marking vis-à-vis non-pivot NP relations as well as pivot NP relations. Given an intransitive+transitive verb sequence such as NP_1 *came*, and NP_2 *saw* NP_3 , the switch-reference system, whichever clause it is marked on, not only provides (direct) information about the reference of the subject of *saw*, NP_2 , but also (indirect) information about the reference of the object of *saw*, NP_3 : if the switch-reference marking is SS then NP_3 will be unlikely to be coreferential with the subject of *came*, NP_1 ; and if the marking is DS there may be a strong implication that it will be coreferential with NP_1 , depending on how many referents have previously been introduced.

The special status of subject in Government and Binding Theory means that it is difficult to extend a binding account to handle cases where object NPs are referentially marked by the switch-reference suffixes. In particular, there is no provision for sharing of indices between object NPs and AGR, and as we saw above, if there was such provision this would just mean that neither [NP,S] nor [NP,VP] was strictly identical with AGR. Finer (1985b:52) does propose an analysis for the Yup'ik Eskimo data, which relies on a definition of object as [NP,VP]: this NP is still in the correct position to be c-commanded. However, this kind of account is only possible when the object is in the marked clause and the subject in the controlling clause; when the object is in the controlling clause and the subject in the marked clause, as in Capanahua, the relation of c-command does not hold. Furthermore, it is not at all obvious how he would handle the data in Warlpiri, which is a non-configurational language in which positions such as [NP,S] and [NP,VP] cannot be defined (Hale 1983). Further complications are introduced by the fact that a notion of agentivity is implicated in the definition of pivot for some languages. Although GB does make provision for the assignment of thematic roles, it is not obvious how or where these could interact with the Binding Theory in order to correctly select switch-reference pivots.

Position of the switch-reference marker

Sometimes switch-reference is marked elsewhere than on the verb.

Examples have been proposed in the literature of languages in which a switch-reference relation appears to be marked on the pivot NP itself: if these are cases of switch-reference, they of course no longer represent a 'violation of categorial iconicity', and would perhaps be difficult to distinguish from other types of reference tracking device. In such cases there is often some question about whether switch-reference is involved or some other functionally similar system such as obviation or logophoricity (see 1.6) - or indeed a

system in between the two which may be in the process of development from one to the other. For example, in Kaingáng, a Brazilian language described by Wiesemann (1982), the switch-reference markers appear to be pronouns, and marking is restricted to the third person (see below); this makes the system look very like a logophoric one although the pronouns do not seem to obey the normal logophoric restriction to reported speech contexts.

The switch-reference morpheme may also be an independent morpheme, usually situated either at the clause boundary or in the position for sentential particles. See the example from Pitjantjatjara given in (6) above. Another clear case seems to occur in Pima, where, as Langdon & Munro (1979) show, the marker is an independent morpheme which appears to occur clause finally; although this morpheme apparently developed from original verbal affixes (Hale 1980), synchronically, it need not even occur adjacent to a verb. A further complication in Pima is that intonational and syntactic tests suggest that the markers are now constituents of the controlling clause, see Haiman & Munro (1983b: x,xv).

Given attested developments of this kind, and given that in verb final languages the switch-reference morpheme will ipso facto be clause final, it has been suggested that at least in some such cases it should be regarded as an independent clause final particle rather than verbal inflection (eg. Comrie 1983:22-3). Such decisions obviously presuppose more general questions about how we can distinguish between free elements and cliticised or affixed ones. Whether the morpheme is clause final or verb final, one could maintain that the crucial defining characteristic of switch-reference (as compared with other devices used for referential tracking) is that it is NOT marked on the relevant NP, but rather is a characteristic of the entire clause, and so is marked either at the clause boundary, or in the position for sentential particles, or on the head of the clause, the verb. The wide range of functions which we shall see are characteristic of switch-reference systems supports this analysis and shows that we should take the switch-reference marker to operate over the whole clause. If one still wants to characterise switch-reference as involving a violation of categorial iconicity, then at least it is no longer so surprising that this should be the case. If we do *not* take some such stance, it may not be possible to give a structural definition of switch-reference which effectively excludes all other such devices.¹²

¹² Comrie (1983:23) makes a similar suggestion for a more neutral characterisation, although he doesn't explain why this should be such an important distinguishing characteristic of switch-reference or what if any functional consequences it has. See chapter 3 of this thesis for further discussion of these points.

Complexities in the systems of markers

Formal complexities which occur in the systems of markers fall into three categories. First we have restrictions on the scope of application of the switch-reference system. Second we have various asymmetries which come under the heading of differences in markedness of SS and DS morphemes. Finally, switch-reference systems may differ in the degree of 'isolability' of the switch-reference morpheme from morphemes marking other distinctions. The final type will be discussed in section 1.5, since it concerns the range of associative meanings which may occur with switch-reference systems.

Some switch-reference systems are said to be restricted to the third person, such as Gokana (Comrie 1983, Hyman & Comrie 1983), Kaingáng (Wiesemann 1982), and Eskimo (Woodbury 1983). However, I have already said that the first two systems may be logophoric, and the Eskimo system is often described as an obviation system; such a restriction in person is the norm in both logophoric and obviation systems, whereas I know of no uncontroversial examples of switch-reference systems which behave this way. Person hierarchies may interact with switch-reference in more subtle ways, as we shall see. If they do occur, restrictions to third person should not be surprising, since as Haiman & Munro (1983b:xi) point out:

Whether or not switch-reference is indicated by verbal concord or a separate category, it is redundant where either subject is first or second person, and necessary where both subjects are third person. We may therefore expect to find languages in which switch-reference is limited to the third person

Asymmetries between SS and DS markers are normally explained in terms of markedness, with SS tending to be the unmarked and DS the marked option. Differences most frequently occur in the formal complexity of the markers themselves and in the number of markers of each kind which the language distinguishes.¹³

Crosslinguistically, either SS or DS may be 'zero marked', although there appears to be a preference for the former. In his typological classification of switch-reference languages as to the number of markers their switch-reference systems have, Jacobsen (1983:168) notes that out of 33 North American languages, 8 clearly or possibly had just one marker rather than two, with the implication that in all cases the absence of this marker (i.e. the zero

¹³ I will not be concerned with the problems surrounding criteria for markedness here, but will take it as a matter of formal complexity only.

option) indicates coreference. The languages include Washo, Seri, and the Jamul and La Huerta dialects of Diegueno. Jacobsen says that in his data there is no clear case of the reverse, a single marker of coreference the absence of which indicates disjoint reference. However such cases do occur: as in Kâte (Longacre 1983:187) where at least one of the two DS markers is zero (SS simultaneous = *huk*; SS sequential = *ra*; DS simultaneous = *ha*; DS sequential = \emptyset). Similarly in Lenakel (Lynch 1983), where SS is marked with a prefix but if the DS option is chosen the 'marked' clause simply appears as an independent clause, with normal finite verb inflection and no special switch-reference morpheme.¹⁴

In a number of Papua New Guinea languages, verbs may be marked with 'anticipatory subject' agreement, i.e. agreement in person and number with the subject of the following clause, possibly in addition to agreement with the verb's own subject. Anticipatory subject markers clearly themselves provide information about the relative similarity or difference of the two subjects, but they normally occur in conjunction with switch-reference marking as well, and are sometimes taken to be part of the switch-reference system. In such languages it is common for both SS and DS verbs to have anticipatory subject agreement, and for DS verbs to have an additional overt marker; thus in the Kanite language of New Guinea, only DS is overtly marked, by a morpheme *-ke* (plus anticipatory subject agreement), while SS verbs just have anticipatory subject agreement. In some languages such as Hua (Franklin 1983:40) anticipatory subject agreement is restricted to occur with DS marking only. This is an instance of the further generalisation that where both markers are overtly realised, the SS marker is often less complex than the DS marker formally. SS markers are often smaller than DS markers and DS markers may consist of the SS marker plus some other element. Thus, Haiman (1983:106-7) notes that in all the (Papuan) languages he discusses, same-subject marking verbs are morphologically less complex than different-subject marking verbs.¹⁵

Many switch-reference languages have multiple sets of markers, with additional elements of meaning being distinguished as well as SS or DS. Such systems are often asymmetrical in that SS and DS markers are not strictly paired as to these additional morphemes - 19 out of the 33 languages Jacobsen (1983:164-6) looked at were asymmetrical. As Jacobsen's

¹⁴ Jacobsen (1983:168) himself mentions that a single DS marker occurs in Klamath and in Northern Paiute, although it is possible that its absence does not regularly indicate SS.

¹⁵ Givón (1983:77-8) claims that this size-differential parallels the normal relation between stressed/unstressed or independent/zero pronouns (see chapter 3). As we shall also see in chapter 3, Haiman (1983) too emphasises this characteristic in his argument that switch-reference is often a historical development of a gapping system.

typology indicates, some of the asymmetrical systems show a numerical preponderance of the DS markers, such as Eastern Pomo, Tonkawa, and Shoshone; and others, of the SS markers, such as Maidu, Papago, Hopi and Tubatulabal.

In this section we have considered in more detail the four formal conditions on canonical switch-reference listed in 1.2: the Locality Condition, the Dependency Condition, the Realisation Condition and the Subject Condition.

We have seen that the Realisation Condition largely holds, since switch-reference marking is normally on the verb or an independent sentential particle. However, we have seen numerous ways in which the syntactic typology of the language, and the syntactic relation between the marked and controlling clause, may affect the relative order of the two clauses. We have also examined a range of complexities which may occur in the system of markers.

Violations of the Locality, Dependency and Subject Conditions have more significance for formal theories of switch-reference. If such a theory is to claim generality it must address cases of 'focused' reference such as Oswalt describes for Kashaya, cases of switch-reference holding between coordinate and chained clauses, recapitulation clauses, the involvement of non-subject NPs, and implication of agentivity in the definition of pivots. All these pose problems for Finer's account.

In this thesis I am most interested in giving an account of the functional complexity of switch-reference systems, and the languages for which the account is proposed do not exhibit focused reference, coordinate switch-reference or involvement of non-subject NPs. These will not therefore be considered any further. However, the account proposed does handle clause chaining, recapitulation clauses and implication of agentivity in the definition of pivots.

1.5. The functional complexity of switch-reference systems

In this section, and in chapter 2, I shall be concerned with the deficiencies of the Functional Condition. Much is made of functional parallels between switch-reference and other grammatical devices in trying to determine how we should account for it, cf. Finer (1985a, b) for example. However, as Heath (1983:130) points out, we first need to make

clear 'what we take the functions of switch-reference to be'.

Before moving on to talk about additional functions which switch-reference systems typically fulfill, a few notes are in order concerning the implications of the statement that SS marking indicates coreference and DS marking indicates disjoint reference between pivot NPs.

First note the general need for caution in interpreting anaphoric relations between NPs as relations of obligatory coreference or disjoint reference, as for example has fairly consistently been done in Binding Theory approaches. To start with, the NPs involved in an anaphoric relation need not be referring expressions. For some discussion of this and other problems see Gabbay & Moravcsik (1973), Bach & Partee (1980), Evans (1980), Nunberg (1984) and Roberts (1984), among others.

More importantly, there has been some controversy within Binding Theory accounts, which is also relevant more generally, concerning whether any syntactic constraints of disjoint reference are required. NPs disjointly indexed by the Binding Theory, such as two NPs in the same clause, may sometimes corefer 'accidentally', although they are not in a relation of **stipulated coreference** (the speaker must intend the two to corefer) as defined by Postal (1971). Cases such as these have prompted researchers such as Dowty (1980) and Reinhart (1983) to propose the universal that languages have devices which constrain two NPs to be coreferential, but do not have any devices which constrain two NPs to have disjoint reference, although a pragmatic principle may exist which means disjoint reference is preferred in certain environments: thus the interpretation of a personal pronoun and some other NP in the same clause as having disjoint reference is due to a pragmatic principle which states that given a way of stipulating coreference, cooperative speakers who know the two NPs corefer will use it. See also Lasnik (1976, 1981).

I mention this controversy because it has a bearing on the interpretation of DS marking, and vice versa. Thus, switch-reference data at first sight provides a counterexample to this general approach, as DS marking is usually taken to indicate stipulated disjoint reference; certainly this seems to be the way Finer (1985a, b) takes it. On the other hand, the chain of argument followed by Dowty and Reinhart may lead us to reconsider the correct interpretation of DS marking, and indeed there is some indication that a less restrictive definition should be given. For example, Nichols (1983:247etc.) says that in a number of languages of the Northeast Caucasus, such as Chechen and Ingush, DS marking verbs have what she calls 'Open Reference', signalling indifference as to the referential relation

between the two pivots rather than specified non-identity. In addition, we shall see some examples in chapter 2 of the use of DS marking when the pivot NPs actually corefer, but something else in the situation changes. A less strict definition of DS would allow these to be grammatical cases and the different interpretations of DS marking presumably would be determined by various pragmatic principles.

However, Saxon (1984) has shown relatively conclusively that it cannot be a universal that languages place no restrictions of disjoint reference on anaphoric expressions. She describes just such a restriction which holds in the Athapaskan language Dogrib, where disjoint anaphors occur which have the same distribution as reflexives. See also Carroll (1986) for similar cases. Furthermore, we shall see that the interpretation of SS marking vis-à-vis DS marking is actually much more complicated than either of the two possibilities discussed so far, and in particular the converse case may occur where DS marking seems to stipulate disjoint reference and SS marking is used otherwise. Thus, Nichols (1983:247etc.) also presents examples of switch-reference like systems, in Lak and Dargi, where it is the SS marker which has Open Reference and DS marking is taken to indicate strict disjoint reference. Furthermore, the definition of SS and DS markers needed for languages in which SS marking is used with a following impersonal controlling clause seems to conform to the same pattern, as we shall see in chapter 2.

In this section three topics will be considered: plurality in switch-reference pivots, additional meanings expressed by switch-reference markers and violations of the Functional Condition.

Plurality in switch-reference pivots

All the examples considered so far have been ones in which both pivot NPs have been singular. Where either or both pivots are plural, a relation of referential overlap or inclusion may hold between the two. The range of cases which occur is represented schematically in (13), where NP_m stands for the marked clause pivot, and NP_c stands for the controlling clause pivot. I shall refer to the referent(s) of a pivot NP as its **pivot set**.¹⁶

¹⁶ I have not included in (13) the cases where both NPs are plural and refer to completely overlapping or completely disjoint groups of participants: in the first case SS is invariably used and in the second case DS is invariably used.

(13)

- (i) NP_m properly includes NP_c eg. $\{a,b,c\} \supset \{a\}$
- (ii) NP_m is properly included in NP_c eg. $\{a,b\} \subset \{a,b,c\}$
- (iii) NP_m and NP_c intersect eg. $\{a,b,c\} \cap \{b,c,d\}$

There seem to be few universal restrictions on whether SS marking or DS marking is used in such cases. Crosslinguistically, SS may be used in all three types, which makes a definition of the switch-reference markers in terms of coreference between pivots seem less plausible.¹⁷

Let us begin with cases of inclusion and set aside the intersection possibility for the moment. Wieseemann (1982:55) has proposed the following implicational universal to describe the potential for SS marking crosslinguistically.

$$NP_m = NP_c > NP_m \supset NP_c > NP_m \subset NP_c$$

That is, in all languages SS is used when the pivot sets are coextensive, and there is no language in which SS is used where the marked pivot is included in the controlling pivot, if it may not also be used for the reverse case where the controlling pivot is included in the marked pivot.

Thus, for some languages, SS marking in cases of inclusive reference is symmetrical, in that it occurs in both case (i) and (ii) in (13). This possibility has been noted by Jacobsen (1967:244), Longacre (1972:14), Langdon & Munro (1979), and others. Oswalt (1983:276) gives examples from Kashaya and Comrie (1983:26ff.) from Huichol. The examples in (14) are from Huichol (Comrie 1983:26-7).

- (14) a. Taame te-haata'azia-ka, nee ne-petia
we 1PL-arrive SS I

When we arrived, I left.

- b. nee ne-haata'a-ka tanaiti te-pekii
I SG-arrive SS together

When I arrived, we left together.

¹⁷ As noted by Finer (1985b:52,n.17) and Chomsky (1981:283-7; 1986:207,n.23), subset and intersection relations also complicate a coindexing formalism for anaphoric relations. In his account of switch-reference, Finer proposes a system of dual indexing to express such relations.

More frequently, SS marking in cases of inclusive reference is asymmetrically allowed in case (i) but not in case (ii). This is the case in Amele, where use of switch-reference marking in cases of inclusive or intersecting reference follows complex rules that are described in chapter 5 (Roberts 1987: 294ff.). This is also the situation in Diyari (Austin 1981:316-7) as examples (15a,b) and (16) illustrate.

- (15) a. Nhulu nganthi pardaka-ma warrayi, thanali thayi-lha
 he-ERG meat-ABS bring-PART AUX they-ERG eat-IMPL(SS)
 He brought the meat for them (i.e. him and others) to eat.
- b. Nhulu nganthi pardaka-ma warrayi, thanali thayi-manthu
 he-ERG meat-ABS bring-PART AUX they-ERG eat-IMPL(DS)
 He brought the meat for them (i.e. others) to eat.
- (16) Thana wapa-ma warrayi, nhulu yinanha nhayi-manthu
 they-NOM go-PART AUX he-ERG you-ACC see-IMPL(DS)
 They (all) went so he could see you.

The final possibility is that SS marking should be symmetrically disallowed for all cases of inclusive reference. This is noted for Pima by Austin (1981:317,n.10) and for Huallaga Quechua by Weber (1980:53), who gives the following examples.

- (17) Chaya-pti/*r-nchi qoyku-shaq
 arrive-DS/*SS-1+2 give-1FUT
 When we (inclusive) arrive, I will give it to him.
- (18) Qam-ta apari-pti/*r-:-pis manam chaya-shun-chu
 you-ACC carry-DS/*SS-1p-even not arrive-1+2FUT-NEG
 Even if I carry you, we will not arrive.

In many languages the possibilities are more complicated since there may be a choice between SS and DS for one or more of the three cases in (13). Thus in the related North American languages Maricopa (Gordon 1983) and Mojave (Munro 1980), and in Kashaya (Oswalt 1983:276), either SS or DS may be used for both case (i) and (ii). The Mojave examples in (19a,b) are from Munro (1980c:145). When a choice is possible, it often seems to be conditioned by whether speakers wish to present the two pivots as the same given the particular situation being described, although Langdon & Munro (1979) note wide variation between speakers of Mojave as well.

- (19) a. 'ava-th '-ivaa-k mat '-kuunav-m
 house-dem 1-arrive-SS recip 1-talk-tense
- I came to the house and then we talked (together).
- b. 'ava-th '-ivaa-m mat '-kuunav-m
 house-dem 1-arrive-DS recip 1-talk-tense

In other languages, choice between SS and DS marking is partly dependent on the person of the pivot NPs. Thus in Kewa and certain other Papuan languages (Franklin 1983:46), in cases (i) and (ii), either SS or DS may be used if the two subjects are in the same person, but DS must be used if they are different person: that is, when there are two degrees of difference between the two NPs rather than just one.

A choice between SS and DS is more likely in case (iii), where the pivots intersect. Thus in Amele, either SS or DS may be used in such cases, unless the controlling pivot is first person, in which case SS must be used.

To return to the points made at the beginning of this section, languages clearly differ in which of the two switch-reference markers has the stronger requirement on it: languages such as Pima take SS marking to indicate strict coreference, and DS marking indicates not strict coreference; other languages seem to take DS marking as indicating strict disjoint reference, and SS marking less strictly, as indicating inclusive reference.

Additional meanings expressed by switch-reference markers

It is very common for other elements of meaning to be signalled by the switch-reference markers in addition to a relation between switch-reference pivot NPs.

Most common is temporal meaning. Switch-reference markers are usually in complementary distribution with finite inflection, particularly tense, and so they themselves may be distinguished either for absolute tense (situating the eventuality in time relative to the time of speech) or relative tense (situating the eventuality in time relative to the eventuality of the controlling clause). Marking of relative tense is by far the most pervasive of the two, and where it is marked, the most common contrast in both North American and Papua New Guinea languages is between **sequential** and **simultaneous** eventualities. Nichols (1983:245) notes similar contrasts in clause chaining Caucasian languages. More strictly, it seems to be a universal constraint that the eventuality in the

dependent marked clause is never posterior to that in the controlling clause, so in practice, this distinction is between simultaneous and anterior relations (cf. for example Oswalt 1983:268). Where the range of clause relations which may mark switch-reference is restricted in a language, it is often restricted to temporal adverbial clauses, which are temporal by virtue of the additional meaning in the switch-reference markers, or to clause chains, which also almost always involve relative tense. An example of such a clause chaining language is Kâte (Longacre 1983:187) See (20a-d).

- (20) a. Fisi-**huk** na-wek
 arrived-SS/SIM ate-he
 As he arrived, he was eating.
- b. Fisi-**ra** na-wek
 arrived-SS/SEQ ate-he
 He arrived, then he ate.
- c. Mu-**ha**-pie kio-wek
 spoke-DS/SIM-they wept-he
 As they spoke he wept.
- d. Mu-**Ø**-pie kio-wek
 spoke-DS/SEQ-they wept-he
 After they spoke he wept.

The switch-reference system in the North American language Kashaya has distinctions for both absolute and relative tense (Oswalt 1983:269). Of the six pairs of suffixes marking SS/DS, one pair indicates simultaneous or alternating action, one indicates that the eventuality of the marked clause sequentially precedes the eventuality of the controlling clause in the present or past, and a third indicates that the marked clause eventuality sequentially precedes the controlling clause eventuality in the future or conditional. The other three suffixes are normally taken to be past tense, but may be specified as future by cooccurring with the future tense suffix already mentioned. Similarly in the Uto-Aztecan language Huichol (Comrie 1983:19) there is a pair of suffixes SS/DS for simultaneous eventualities, and two pairs signalling that the marked eventuality is sequentially anterior to the controlling eventuality, one for past and one for future tense. In Wojokeso, a Papuan language (Longacre 1983:192) the switch-reference marked medial verbs distinguish simultaneous from sequential relations, and also mark two tenses, nonfuture vs. future. Similar tense contrasts are indicated in Bantu languages by Wiesemann (1982).

Where absolute tense distinctions are made, they usually just distinguish non-future from future tenses, regardless of the fact that finite inflection in the language may incorporate very complex tense distinctions. Thus, final verbs in Wojokeso distinguish six tenses. The tense of the marked verb must agree with that of the controlling verb. For some languages it seems preferable to analyse this distinction as a realis/irrealis mood distinction, as in Amele (Roberts 1987: 239, 275; 1988: 50).

It is common for switch-reference paradigms encoding distinctions in temporal relations between eventualities, to also incorporate distinctions in the logical or epistemic relations between the two clauses. These relations usually have to do with expectation, causality, condition or contrast, and mark meaning distinctions normally translated into English by expressions such as: *if, because, so that, but, although, in spite of, nevertheless, in order to, presumably, resulting in, providing*, etc. Thus in Kashaya, the three pairs of markers not specifically marked for tense indicate counter-expectation, inference, and inferential counter-expectation. Rather unusually, in some dialects of Kewa the simultaneous and sequential SS suffixes distinguish benefactive from non-benefactive actions as well (Franklin 1983:42).

Sometimes additional aspectual information may be marked as well, such as distinctions between progressive and completed action, or habitual and non-habitual action. In Kewa, the simultaneous markers also distinguish between 'split' and 'unit' forms, depending upon whether the action is perceived as separate from or united with the following action (Franklin 1983: 42). Similarly, the Papuan language Fore distinguishes three categories: sequential, simultaneous, and a third category of 'association', which relates two verbs that are considered to represent parts of the same process (Longacre 1983:188).

When additional meanings of these kinds, or other kinds to be discussed below, are signalled by switch-reference markers, the markers are often referred to as portmanteau morphs, and indeed they may derive historically from separate morphemes. However, the synchronic situation is such that the original separate morphemes are no longer isolable, and in any case, there are interesting asymmetries between SS and DS markers with respect to their associative meanings which would need to be explained even if the morphs were isolable. Clearly, though, there is little difference functionally, in whether temporal or logical information is encoded by a morpheme adjacent to the switch-reference marker, or by the marker itself.

Certain interesting asymmetries between SS and DS markers occur with respect to the

marking of temporal relations. Where absolute tense distinctions are marked, they are more likely to be marked on DS morphemes than on SS morphemes, which reflects a general tendency for DS-marked clauses to show a greater resemblance to independent clauses than SS-marked ones. Longacre (1983:187-8) notes a number of languages, eg. the Papuan language Managalasi, where of the quadrants in the diagram below, all but SS/SIM are subdivided by morphemes which additionally distinguish past, present and future tenses.

	SIM	SEQ
SS		
DS		

It is harder to make generalisations about the asymmetries which occur in the marking of relative tense. It is quite common for the simultaneous/sequential contrast to be restricted to only one kind of marker, SS or DS, but it is not clear whether one of the two kinds of restriction is more prevalent. For example, one might expect more distinctions for DS marking again, but it seems that no such generalisation can be made, and in fact the reverse tendency may apply. Thus, Wojokeso (Longacre 1983:188) overtly distinguishes simultaneous/sequential only for DS markers (in fact, in Wojokeso, SS is zero-marked, and the simultaneous/sequential distinction for SS is understood just on the basis of the lexical items in the sentence itself and the sense of the immediate context). In contrast, in Kewa (Longacre 1983:41; Franklin 1983) the simultaneous/sequential distinction is obligatorily indicated in the SS paradigm, by the invariable SS suffix which Franklin refers to as a portmanteau morph, but in the DS paradigm the temporal relation is not obligatorily marked, although special markers of simultaneous/sequential ordering may be added to the person-number suffixes. Likewise in the South American language Ancash Quechua (Comrie 1983) the SS morphemes mark the additional aspectual distinction between related (-*r*) vs. unrelated (-*shpa*) events, but only one DS marker occurs (*pti* plus subject-verb agreement).

Apart from these asymmetries in the marking of temporal and aspectual meaning, switch-reference languages tend to exhibit what Longacre (1983:198) calls a 'naturalness assumption' regarding the association between SS and DS marking and simultaneous and sequential ordering. SS marking tends to be taken to imply sequentiality of the eventualities being described, which seemingly reflects an expectation that successive actions will be performed by the same person, or perhaps that actions performed by the same person will normally be performed in succession. Conversely, DS marking tends to be taken to imply simultaneity, which apparently reflects an assumption that actions which overlap are performed by different people. This pattern is illustrated in the figure below. It is important to remember here that in both cases we are dealing with actions or more generally eventualities which may be presumed to be already situated within a relatively constrained event sequence, by virtue of being marked for switch-reference at all.

SAME/DIFFERENT TEMPORAL INTERVAL?

		SIM(yes)	SEQ(no)
SAME/DIFFERENT PIVOT REFERENCE?	SS (yes)		X
	DS (no)	X	

For example, in Tunebo, a Colombian language, a verbal suffix *-r* indicates temporal sequentiality and same subject reference, and a suffix *-yat/-t* indicates temporal simultaneity and different subject reference. Longacre (1983:198) claims that for this language the distinction between simultaneity and sequentiality is more basic than the SS/DS distinction: while the SS/DS distinction holds in the unmarked situation, granted explicit marking by a nominal, *-r* can be used with a disjoint subject referent in the following clause, and *-yat/t* with a same subject referent.

Another South American language, Guanano, makes the same assumption as Tunebo but differs from it in that there is a completely unmarked type of clause chain construction for which the naturalness assumption holds, and another type of clause chain construction which explicitly employs switch-reference in connection with marking other relations, both temporal and logical. These are called the **implicit chain** and the **explicit chain** (Longacre

The Guanano implicit chain consists of clauses with unaffixed verbs followed by a final clause whose verb is fully inflected. Interpretation depends on the lexical items in the chain and the surrounding linguistic context: if these factors point to eventualities in temporal succession then all the verbs of the chain are considered to have the same subject referent; if the lexical and contextual factors indicate eventualities in temporal overlap, they are considered to have different subject referents. A chain which encodes temporal succession, and hence SS, is often of three or more clauses in length, while chains which encode overlap, and hence DS, are typically binary.

The Guanano explicit chain has an overt switch-reference system. In its basic form, a clause whose dependent verb is marked with a switch-reference suffix is followed by a clause whose verb is independent. The explicit chain is a restricted structure as compared with the implicit, which can involve a long sequence of clauses. Longacre (1983:201-2) proposes the following explanation: 'Apparently, it is not felt necessary to mark overtly switch-reference over such a long sequence; rather for such sequences the implicit chain takes over'. Explicit chains may embed within implicit and are often resorted to so that local ambiguities in discourse may be resolved, or to encode one of a number of specific logical and temporal relations.

This 'naturalness assumption' is not an absolute universal by any means, since there are plenty of languages in which both temporal orders are marked for each of SS and DS, though I know of none in which the opposite association is made, i.e. of simultaneity with SS and sequentiality with DS. Longacre (1983:187,206) claims that while the naturalness assumption is common in the languages of Northern South America, it has not been observed in languages of Papua New Guinea: 'Or, to put it another way, I have not seen in Papua New Guinea a switch reference system that makes the switch reference system dependent on and subordinate to temporal concerns' (p.206). The Guanano implicit chain superficially resembles a construction which is found in some languages of Papua New Guinea: the 'stripped down clause chain', where medial verbs occur with only minimal inflection throughout all or part of a clause chain. In some languages such stripped down (portions of) chains are exclusively SS strings. However, these chains differ from the implicit chains in Guanano in that they are more cohesive than the regular switch-reference chains and embed within them, and in that the stripped down form of the verb may still distinguish simultaneous/sequential relations even if they lack some of their other inflection

(as in Amele; see Roberts 1987:107,236,273,314).¹⁸

To complete the picture, we should consider languages such as Swahili, in which there is no indication of SS/DS marking, but special morphemes are used to indicate simultaneity or sequentiality between the eventualities in related clauses. Example (21) is cited by Hopper & Thompson (1980:281). In Swahili, the usual narrative past tense is marked by the prefix *-li* on the verb; hence *a-li-soma* means 'he-PAST-read', and so on. However, when a number of verbs denoting events in sequence occur together, only the first receives an explicit tense prefix. The others are marked with a connective 'tense' (relative tense) prefix, *-ka*.

- (21) Tu-li-po-sema vile, wa-ka-jua kama wevi, mara
 we-PAST-when-say thus, they-SEQ-know as thieves, at once
 ile wa-ka-ondoka wa-ka-kimbia
 that they-SEQ-leave they-ka-run away

When we said this, they knew that they had been recognised, and they
 at once got off (the train) and ran away.

The *ka-* prefix is restricted to the narration of single consecutive events, so it functions to trace the story line - the foregrounded parts of a narrative. This storyline may be interrupted by other events not central to the narrative, but which modify or comment on the central events. Such interrupting events may be either contingent (conditional) or simultaneous, and in either case they are backgrounded and indicated with the prefix *ki-* on the verb, as is illustrated in example (22). Hopper & Thompson's (1980:282) 'psychological' explanation for this system is that there is a processing need to signal those parts of the discourse that are to be stored for immediate sequential processing, vs. those needed for future reference or concomitant accessing.

- (22) Hata wa-li-kuwa wa-ki-rejea kuja zao kambini,
 until they-PAST-were they-SIM-return come their to_camp,
 wa-ka-shuka kilima-ni magharibi, mara wa-ka-kuta
 they-SEQ-descend hill-LOC west, suddenly they-SEQ-come_upon

¹⁸ Nichols (1983:249) notes that in the languages she considers, simultaneous forms favour open reference readings (usually DS) and sequential forms favour restricted reference readings (usually SS); it is not clear whether the same tendencies hold for those languages in which SS has open reference and DS has restricted reference.

kondoo,	bwana	wangu	ka-m-piga	kondoo	mkubwa	sana
sheep	master	my	ka-him-shoot	sheep	big	very

na	pembe	zake	nzito	sana
and	horns	its	heavy	very

When they were making their way back to camp, they came down a hill on the western side, and at once came upon some wild sheep, and my master shot an enormous sheep, and its horns were very heavy.

Similarly, in Fe?fe? (Haiman 1983:127), clauses which are simply juxtaposed describe events which took place at the same time or under the same circumstances, while clauses separated by the coordinate conjunction *ni*, 'and then', describe events that are separated in time and space.¹⁹

The range of data which has been considered in this subsection shows that switch-reference marking cannot be considered in isolation from other indications of relative cohesion between the eventualities described by clauses. In the languages we have considered, switch-reference marks 'relative reference' (vs. absolute reference), just as it marks 'relative tense' (vs. absolute tense). Furthermore, these two types of function seem to obey similar structural constraints, for example in the scope of the relation. Thus, where switch-reference markers do merge these two distinct referential notions, nominal and temporal, as one would expect they are both of the same 'reference type' in the sense of Oswalt (1983), i.e. they are both sequential reference or both focal reference - so in Kashaya, the temporal relations marked follow the focal ordering of the nominal relations.

Information about the person, number and gender of the pivotal participants may also be encoded in switch-reference markers. Thus, the switch-reference system in Kobon (Comrie 1983:20) has portmanteau morphs encoding person and number in addition to the SS/DS distinction. Again, sometimes this kind of information appears to be part of the switch-reference system in the broadest sense, even though it may be encoded in an isolable morpheme. In Amele (Roberts 1987), switch-reference is marked partly by invariant SS and DS morphemes, partly by reduplication, and partly by choice of subject agreement paradigms from a subset of paradigms which occur only on switch-reference marked verbs. Whether the person/number/gender information is isolable from the switch-reference

¹⁹ It is not clear from what Haiman says whether Fe?fe? has a switch-reference system, or if so, how it interacts with this distinction.

marker or not in any particular language, it seems to act as a kind of redundant subject agreement marking on the marked verbs. Subject agreement distinctions may be marked on both SS and DS, or on just one of these, with a tendency towards marking on DS for obvious reasons. Kewa (Franklin 1983:40) provides a typical example: the SS verb has a constant form, with no inflection for person and number of the subject, and is followed by an invariable SS suffix. The DS marked verb is inflected for person and number, but takes different inflections from those which occur on final verbs. In contrast, the Guanano switch-reference morphemes distinguish person, number and gender for SS markers (with five suffixes) but have just one undifferentiated DS marker (Longacre 1983:201).

Jacobsen (1983:164-6,169) categorises the 33 North American languages he surveyed as to the number of distinctive SS and DS markers they have, i.e. how many different additional meaning contrasts they make. There are no languages which do not have at least one extra category associated with at least one of SS or DS. Most languages show no more than three associated categories, with Kashaya (6) and Tonkawa (possibly 7) making the most distinctions. He also considers the symmetry of the systems with respect to the distinctions made, and the morphological isolability of the different elements of meaning with respect to the switch-reference morphemes. A clearly symmetrical pairing of SS and DS markers occurs in only 14 out of the 33 languages, although for almost all languages, the number of distinctions made for SS and DS differs by no more than one. The data on isolability suggests that all those languages where the switch-reference marker encodes additional temporal/logical meaning are languages in which the switch-reference markers are portmanteau morphs. In general, isolability of the different elements of meaning is rare, occurring in only 9 out of 33 languages.

Apart from the meaning distinctions marked by different pairs of switch-reference markers, note that all the switch-reference markers in a system share the function of indicating that the marked clause is dependent. In a clause chain, the nature of this dependence is reliance on the final clause for tense and other information encoded in finite inflection. For other languages, the switch-reference marker shows that the clause is a subordinate one, and may also indicate dependence for tense etc. on the matrix verb. The signalling of particular temporal and logical relations between the clauses may be seen as further specifying the nature of this dependence.

The additional information conveyed by switch-reference markers is almost always acknowledged in the literature, but is usually ignored in any general account which is proposed. See Finer (1985a), who doesn't propose an account for it because it falls

outside the scope of the Binding Theory, although as we have seen he does use it as an argument for putting SS and DS under COMP. Even Jacobsen (1983:152) 'sets aside many other interesting questions' including 'the secondary nuances of meaning that switch-reference markers have been seen to have developed (or retained) in certain languages'.

Violations of the Functional Condition

We have seen that the Functional Condition is rather simplistic in describing the stipulated relation between switch-reference pivots as one of coreference or disjoint reference, in particular given the behaviour of switch-reference marking when either or both pivots are plural. In addition, we saw that the Functional Condition does not take account of the additional meanings which may be distinguished by switch-reference systems, in particular the rather striking conjunction of nominal and temporal meaning which occurs.

Other violations of the Functional Condition occur, involving seemingly 'aberrant' uses of SS markers when the subject NPs in the two clauses appear to be in a relation of disjoint reference, and uses of DS markers despite the fact that the subjects appear to be coreferential.

I am here excluding cases where the marking on adjacent clauses seems unexpected due to the phenomenon of 'clause-skipping', i.e. we start from the premise that the clauses in question are in the correct relationship of marked and controlling clause. Nor shall we be concerned with cases where some switch-reference markers appear to be undergoing diachronic change, usually in very restricted contexts in the language, as Oswalt (1983:275) describes for Kashaya, where two of the markers seem to be developing into conjunctions and may be used regardless of the referential relation between the pivots of the two clauses. I also exclude cases where particular verbs are lexically specified to take coreferential (and therefore SS marked) or noncoreferential (and therefore DS marked) subordinate clauses; cf. Austin (1980:17) for Diyari and Munro (1980c:145) for Mojave.

In the range of cases I will be concerned with, unexpected uses of SS marking are all of the same kind: they occur when the controlling clause is an impersonal construction. This is a pervasive phenomenon, occurring in geographically diverse switch-reference languages. I shall consider these cases in detail in chapter 2, where I conclude that they should be accounted for by introducing a notion of **agentivity** into the definition of the switch-reference pivot for the languages in question.

Unexpected uses of DS marking are at first sight a less cohesive range of cases. These too will be described in chapter 2. I shall argue that they can be given a uniform description however. DS marking may be used even if there is coreference between pivot NPs, if some other characteristic of the eventuality being described has changed: the degree of control involved, the spatial location, the actuality of the eventuality, or the temporal event complex of which it is a part. It is notable that a number of these changes involve temporal, aspectual or modal meaning, that is, meaning of the kind that we have seen is often associated with switch-reference.

In chapter 2, I will show that these 'functional extensions' of the switch-reference system are systematic and regular, and should be accounted for by any comprehensive theory of switch-reference.

1.6. Logophoricity and obviation

In the final section of this chapter, we shall briefly consider some phenomena which are structurally and functionally similar to switch-reference, and for which the terms **logophoricity** and **obviation** have been used.

Logophoricity

Logophoric systems have been identified in numerous West African languages.²⁰ It is not surprising that these systems have been likened to switch-reference, since distinct subject pronouns are used in a dependent clause to indicate same or different reference with the subject of a controlling clause. On the face of it, the only difference between the two types of system is in whether marking is on the NP or on the verb. In logophoric systems, the markers are normally part of the language's pronoun system rather than being affixes or conjunctions used alongside any pronouns which are usually present, as in switch-reference.

For example, in Igbo, noncoreference between subjects of a dependent and an independent clause is indicated by the regular third person singular pronoun *ó*, coreference by the

²⁰ The use of 'cross-clausal reflexivisation' in Icelandic, Japanese and other languages is also claimed to be logophoric. See Sells (1987) and chapter 6 of this thesis.

special pronoun *yá*. See example (23) from Comrie (1983:21). West Africanists refer to special pronouns like *yá* as **logophoric pronouns**.

- (23) a. *ó* *srɪ* *nà* *ó* *byàrà*
 he_i said that *he_j* came
 b. *ó* *srɪ* *nà* *yá* *byàrà*
 he_i said that *he_i* came

These similarities have led Comrie (1983:20f.) to suggest that a type of switch-reference system occurs in the Nigerian language Gokana, for which he has adopted the term logophoric, because it is similar to the logophoric constructions found in other African languages.²¹

In Gokana, in certain constructions, especially the reporting of indirect speech, the verb of the dependent clause takes an *-ɛɛ* suffix if the subject of the dependent clause is coreferential with that of the main clause, and no such suffix if it is not; see (24).²²

- (24) a. *ae* *ko* *ae* *do*
 PRO said *PRO* fell
 He_i said *he_j* fell.
 b. *ae* *ko* *ae* *do-e*
 PRO said *PRO* fell-LOG
 He_i said *he_i* fell.

From the point of view of other logophoric systems, what makes Gokana look somewhat different is that logophoric reference is indicated by a verbal suffix rather than by a pronoun. Otherwise, logophoricity in Gokana functions more or less similarly to the other languages cited in the literature: it marks coreference (or by default, disjoint reference) between a NP in a matrix clause and a NP in a embedded clause. In example (24a) there is no logophoric marker on the verb, and the ordinary personal pronoun in the embedded

²¹ At the time his paper and the collection it was in appeared, there seemed to be some desire to identify a switch-reference system in an African language, cf. Comrie (1983:18): 'Africa has generally been considered [...] devoid of switch-reference'. Hyman & Comrie (1983) describe the Gokana system as logophoric and don't mention its similarity to switch-reference.

²² The suffix has morphophonemic variants with a short vowel, a nasalised vowel, a close-mid vowel, *n* or *r* before the vowel, and also certain combinations of these.

clause is therefore interpreted as disjoint with the pronoun in the matrix clause. In (24b) logophoric marking does occur, and the pronouns are therefore interpreted as having coreference. Comrie (1983:36) has suggested that this is a young switch-reference system, presumably developing out of an earlier logophoric system.²³

Despite their apparent functional equivalence, and the formal similarity between the Gokana system and switch-reference systems, there are significant differences between logophoricity and switch-reference, which cast doubt on the usefulness of trying to subsume one under the other. These points of difference are listed below.

The most important difference is that logophoric marking is usually not pervasive like switch-reference, but is restricted to the embedded complement clauses of a set of **logocentric verbs** which can be distinguished on a largely semantic basis. The set of logocentric verbs centrally includes verbs of reporting, and thus the dependent clauses in which logophoric pronouns are licensed are archetypally contexts of reported speech. Sometimes verbs of mental or psychological state also trigger **logophoric contexts**, which in such cases could be seen as contexts of 'implicit reporting'. The set of contexts in which logophoric pronouns may be used is also sometimes grammaticised to include syntactic contexts which do not have an obvious semantic relationship with the other contexts: logophoricity is often associated with the presence of a complementiser which tends to be homophonic with the verb 'say' and may originate as a reported speech opener, but which may spread to be used in other clauses such as complement clauses generally, or even relative clauses. Switch-reference is not restricted in this way: it may be restricted *syntactically*, to particular kinds of subordinate or medial clauses, but it is not restricted to particular lexically governed semantic contexts.

In Gokana, as in other cases of logophoricity, the marking is not pervasive: according to Comrie (1983), the system in Gokana seems to have arisen in indirect speech, and marking is restricted to certain subordinate constructions of reported speech; certainly it has not

²³ Comrie (1983:21) reports that Gokana is the only African language he knows of where the *verb* of a dependent clause is marked to indicate coreference rather than a special pronoun being used. In this sense it clearly is closer to the other switch-reference systems we have seen than to the type of logophoricity found in Igbo. However, Clements (1975) reports that in Ewe, the logophoric pronoun, like other pronouns, is cliticised to the verb, so Comrie's distinction is not a particularly clear one, introducing the familiar problems presented by trying to distinguish between free pronouns, verbal cliticisation of pronouns, and verbal inflectional morphology. It might be argued that a more reliable distinction between Gokana and other logophoric languages is that in Gokana separate pronouns occur as well as marking on the verb, and there is no morphological variation in the form of the marker. Other languages which may straddle logophoricity and switch-reference include the Chadic language Kera, which is said by Frajzyngier (1985:34), citing Ebert (1979:130), to have a set of logophoric pronouns which are 'used in dialogues to indicate switch-reference'.

spread to subordinate clauses in general and not to coordinate clauses at all. Again, in Gokana the logophoric context is introduced by *ko*, which is both a verb, 'say', and a complementiser.

In addition, there are rather marked differences between the pivotal NPs in a logophoric relation and switch-reference pivots. Typically, the logophoric pivot in the controlling clause, called the **logocentric NP**, is constrained to be either the source of the reported speech, thought or emotion, or the subject NP, or both. That is, in many languages it need not be subject as long as it is source, and conversely not all subjects are licensed to be logocentric NPs. The logophoric NP itself, in the marked clause, normally may have any grammatical function whatsoever.

Thus in Gokana, the pivot NP in the controlling clause may be either the subject or a non-subject 'source', and the pivot NP in the marked clause may have any grammatical function. (25) shows that the argument of the embedded clause which is coreferential with the subject of the matrix clause is not necessarily the embedded subject.

- (25) lebaree ko ae de-e a gia
 Lebare said PRO ate-LOG PRO yams

Lebare_i said he_i ate his_i yams.

Lebare_i said he_j ate his_i yams.

Lebare_i said he_i ate his_j yams.

In this example both NPs in the embedded clause may be interpreted as logophoric. This is common in logophoric languages, and in languages which mark logophoricity pronominally, they would both have the logophoric form.

Logophoric NPs also tend to be restricted to third person, although second person logophoric pronouns sometimes occur, and much more rarely, first person ones. Once again, the marking in Gokana is not pervasive but depends on the person of the relevant NPs: it is obligatory if the coreferential NPs are 3rd person, it is optional though preferred if they are 2nd person singular, and optional though dispreferred if they are 1st person.²⁴ As we have seen, this restriction in person is unusual for a switch-reference system.

²⁴ It is impossible for morphological reasons to add the switch-reference suffix to the 2nd person plural.

Switch-reference can indicate more than just coreference or disjoint reference, i.e. it can have various extended functions, and the switch-reference marker usually carries additional meaning anyway, indicating different temporal/logical relations between the clauses. We shall see in chapter 6 that logophoric marking also can have the extended function of indicating the speaker's attitude to the reported proposition. However, even if we consider just the coreferential element of meaning, switch-reference and logophoricity differ in that logophoric systems mark a NP if it is coreferential, and disjoint reference is indicated by the unmarked form of the clause, without a logophoric pronoun. In contrast, switch-reference systems mark a clause for SS or for DS, with a general tendency for coreference to be the unmarked case.

Comrie (1983:27) considers further evidence of the atypicality of Gokana 'switch-reference' to be its treatment of inclusive and overlapping reference. There are in fact quite clear differences between logophoric and switch-reference systems in this respect. Logophoricity is more restricted in the possibilities allowed when one of the two pivot NPs is plural and 'includes' the other. Recall (13) in section 1.5 where the three possible cases were listed, (i) where marked clause pivot contains controlling clause pivot; (ii) where controlling clause pivot contains marked clause pivot, (iii) where the two pivots intersect. In logophoric systems, only case (i) is treated as coreference; cases (ii) and (iii) are treated as disjoint reference. In switch-reference systems, crosslinguistically, systems can be found in which any of these three cases are treated as coreference and the SS marker used.

The most interesting evidence relevant to determining the relationship between switch-reference and logophoricity comes from languages which appear to have both kinds of systems. We have seen that more than one switch-reference system may occur in a language, so *prima facie* it doesn't mean very much to point out that there are languages in which both switch-reference systems and logophoric systems exist independently. However, if it is possible to have logophoric marking and switch-reference marking in the same clausal environment, it would indicate that the two systems have distinct functions in that language.

Wiesemann (1982:43,54) claims that switch-reference systems are found in a number of Bantu languages, particularly of the Grassfields region of Cameroun. Some of these languages (eg. Ngyemboon) just have switch-reference and no logophoric marking, but in others (i.e. Noni, Bafut, Aghem) switch-reference seems to be used alongside a logophoric system. Wiesemann presents no relevant data in this paper, but cites as her sources Anderson (1979) on Aghem, Hyman (1981) on Noni and Mfonyam (p.c.) on Bafut.

Nichols (1985) has reported on the presence of a logophoric system in Chechen and Ingush; as we have seen, Nichols (1983) reports the presence of a switch-reference like system in these languages also. In the 1983 paper, she mentions in passing the intimate connection between switch-reference marking and the possibility of use of long-distance reflexive pronouns (pp.248,250,252,255-6). In these languages, 'cross-clause reflexivisation' is possible of a kind which has been likened to logophoricity in Icelandic, Japanese and other languages (see Sells 1987 and chapter 6 below). The relationship between the two systems in the Northeast Caucasus languages seems to be that SS marked clauses disallow this use of the reflexive, whereas DS marked clauses allow it; Nichols claims that the relevant restriction is not due to the SS marking per se, however, but due to the fact that the SS marked verb is a medial verb. Interestingly, all the examples she gives of cross-clause reflexivisation involve the verb 'say', which makes it look typically logophoric. O'Connor (1986) too has apparently reported a logophoric system for Northern Pomo (cited by Sells 1987:450), and Pomo languages have switch-reference systems. Oswalt (1983:286-7) notes that Kashaya has 'reflexive' third person pronouns by which an argument of a subordinate clause may be represented as coreferential with an argument of a governing verb; disjoint reference is indicated by use of any other third person pronoun; this is most useful in constructions which do not take part in the switch-reference system, although it may also be used in switch-reference marked clauses for non-subject arguments.

Gokana is clearly a logophoric system. It has all the important characteristics of logophoric systems, and the fact that the marking is on the verb, far from being a reason to distinguish it from other logophoric systems, actually fits with the range of variation one might expect given the cliticisation of pronouns onto the verb in many of these languages. The question of the relation between logophoricity and switch-reference is a separate issue. Both logophoricity and switch-reference offer ways of indicating anaphoric relations between two clauses which involve the privileging of some argument in each clause and specifying of co/disjoint reference between them. The main distinctions between the two types of system are on the one hand that switch-reference systems are better seen as a kind of clausal agreement which offers the potential for indicating maintenance or interruption of other characteristics of the clause, and on the other that the use of logophoric marking is restricted to logophoric contexts. Switch-reference tends to be widespread in the languages which exhibit it, whereas logophoricity is not so central to the grammatical system of the languages which exhibit it. Clearly, given the fact that logophoric contexts may be extended beyond the set of contexts which were originally motivated semantically to a set which is motivated syntactically by the presence of a complementiser, there is the potential for one kind of system to develop into the other.

In chapter 6, we shall consider logophoric phenomena in much more detail, and shall include in the discussion long-distance reflexives from Scandinavian languages and Japanese, which appear to behave in an essentially logophoric way. On the basis of what we have seen so far, it is hard to see why there is any more reason to class these two types of system together than to identify either with any other way of marking coreference within defined interclausal domains.

Obviation

Obviation is a type of phenomenon which is claimed to be functionally comparable to switch-reference, but which is distinguished from it. Central cases occur in certain Algonquian languages, including Algonquin, Kutenai, Apachean and Keresan, and it was with reference to these languages that the phenomena was first defined. See Jacobsen (1983:151). The terms **obviative** and **proximate** are used of these languages to refer to markers which are, 'referentially, if not structurally' (Jacobsen 1983: 153) part of the series of pronouns and which are assigned to two different third person referents according to their relative centrality or importance in the discourse. Hence obviation is often thought of as an extension to the person system, and the obviative pronoun is called the 'fourth person'.²⁵

As well as this difference in function, obviative systems again contrast with switch-reference systems in that the obviative markers are part of the series of pronouns rather than affixes or conjunctions used alongside any pronouns which are normally present. Also, once again the obviation system is restricted to the third person.

The Yup'ik Eskimo system (T. Payne 1980, Woodbury 1983) is described as an obviation system, but it not clear on what basis it is distinguished from logophoric systems, since the 'fourth person' pronoun actually seems to be a reflexive third person pronoun (see Woodbury 1983:291).

²⁵ Confusion has arisen because the terms 'proximate' and 'obviative' have been used for oppositions in certain Uto-Aztecan languages (Huichol, Hopi, Papaga) which are more normally agreed to be cases of switch-reference, not obviation as in Algonquin languages. For these languages 'proximate' is used for SS, 'obviative' for DS.

1.7. Conclusion

A major problem for Finer's account, as for others which assume canonical switch-reference, is that it lacks generality because there is a significant range of data which it fails to account for. As indicated in section 1.4, crosslinguistically there are nontrivial violations of the Locality Condition, the Dependency Condition, and the Subject Condition. In section 1.5, we saw that the Functional Condition too fails to represent the complexity of switch-reference systems. Violations of the Functional Condition are considered in more detail in chapter 2. In the face of counterexamples, Finer (1985a) suggests that only some types of switch-reference are to be accounted for by the Binding Theory, and other types by some other set of grammatical principles. Is it possible to find a unified account?



2.1. Introduction

In chapter 1, I said that the canonical conception of switch-reference assumes that it satisfies the **Functional Condition**, which stipulates that the function of switch-reference markers is to indicate obligatory co/disjoint reference between the two subject NPs of the related clauses. However, I pointed out that in at least some languages with switch-reference systems, there is not an absolute correlation between SS marking and coreferential subjects, DS marking and subjects with disjoint reference. Although a few of these apparent anomalies of marking are the result of historical changes and other peculiarities, most are the result of **functional extensions** of the system. Clearly, this presents problems for an account in terms of syntactic binding such as is proposed by Finer (1985a, b). If we take it to be a defining characteristic of a switch-reference system that it should satisfy the Functional Condition, then a number of otherwise absolutely prototypical systems fail to meet this criterion.

In this chapter, we will explore violations of the Functional Condition in four languages in some detail. They are the North American language **Eastern Pomo**, the Papuan language **Amele**, the Austronesian language **Lenakel** and the South American language **Imbabura Quechua**. I shall also refer to supporting data from other languages. Although the languages are from different language families and geographical areas, the supposedly 'aberrant' uses of SS marking and DS marking which they exhibit are surprisingly similar in type. In section 2.2 we will consider unexpected uses of SS marking with noncoreferential subjects. In sections 2.3, 2.4 and 2.5 we will consider unexpected uses of DS marking with coreferential subjects.

In chapter 3, I shall argue that these 'violations' of the Functional Condition are actually rather systematic, and that rather than dismissing them as isolated exceptions, we should accept that any comprehensive theory of switch-reference should provide a coherent account for them, even though this may require a different theoretical conception of switch-reference and a different kind of formal account than have hitherto been subscribed to. In chapter 5, a formal account for switch-reference in Amele will be proposed which is capable of handling the full range of phenomena identified in this chapter, and which therefore can readily be modified to describe the switch-reference systems in the other three languages discussed.

Our first hypothesis about what switch-reference does, based on the Functional Condition, and conforming to the bulk of the literature on switch-reference, is the following:

HYPOTHESIS 1:

SS indicates that the subjects of the two clauses are coreferential.

DS indicates that the subjects of the two clauses have disjoint reference.

Notice that on this hypothesised definition, both SS and DS are taken to **stipulate** a reference relation of sameness or difference between the subjects of the two clauses; we saw in 1.5 that this is an inadequate reflection of their function in a number of languages. Languages may make a distinction between SS and DS markers such that only one of the two specifies what Nichols (1983) calls 'Closed Reference', i.e. stipulates a reference relation, with the other having 'Open Reference'. Taking into account relations of overlap and inclusion which arise when one of the NPs is plural may also lead to a less restrictive and symmetrical definition for the two switch-reference markers. In this chapter we will be concerned with other ways in which the definition needs to be modified, and so shall ignore these complexities for the present.

2.2. Impersonal constructions and switch-reference

In this section we will be concerned with unexpected uses of SS marking when there is apparently disjoint reference between the subjects of the two clauses. We will focus on Imbabura Quechua and Amele, although supporting data will be adduced from some other languages. The conclusion of the argument will be that for these languages, the function of the switch-reference markers and the definition of switch-reference pivot needs to be redefined to take into account a notion of agentivity.

Imbabura Quechua (IQ), a South American language spoken in Ecuador, has two sets of switch-reference markers (see Cole 1982, 1983 and Jake 1985 for a fuller description). On adverbial clauses (of time, place, purpose etc.) switch-reference is marked by the morphemes **-shpa-** (SS) and **-jpi-** (DS), as in examples (1) and (2).

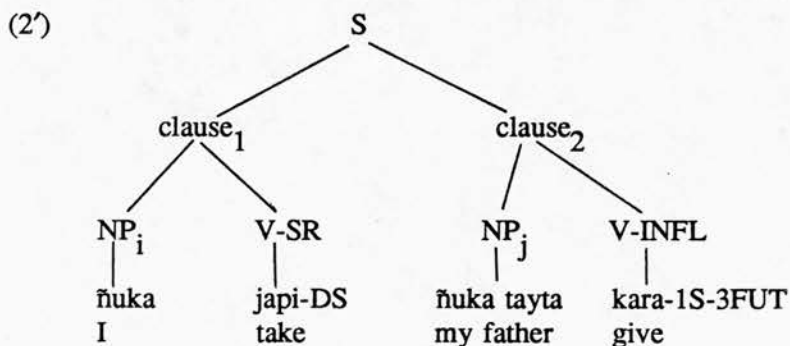
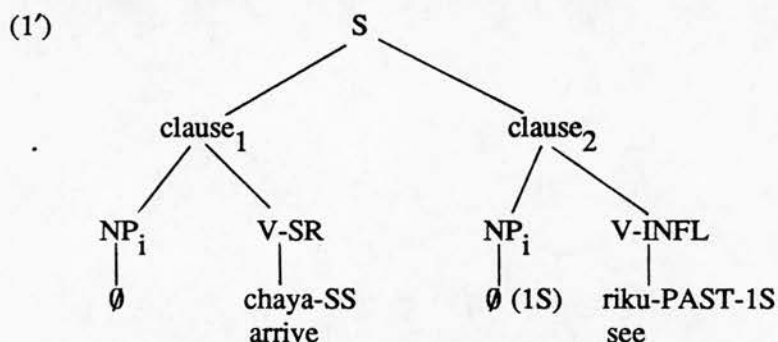
- (1) Kitu-man chaya-shpa-mi rijsi-ta riku-rka-ni
 Quito-to arrive-SS-WIT acquaintance-ACC see-PAST-1S

When I arrived in Quito, I saw a friend.

- (2) Nuka ashtaka kulki-ta japi-jpi-ka ñuka
 I much money-ACC take-DS-TOP my
- tayta ishkay llama-ta kara-wa-nga
 father two sheep-ACC give-1S-3FUT

If I make a lot of money, my father will give me two sheep.

(1') and (2') are schematic representations of these sentences, ignoring irrelevant elements, which show that they fit the formal definition of canonical switch-reference marking given in chapter 1. Switch-reference marking is by suffixation on the verb of a dependent clause which immediately precedes its controlling clause. Note that IQ is a 'pro-drop' language, that is, overt subject NPs may be freely omitted.¹



¹ Details of these trees, eg. the use of the abbreviation 'INFL' for 'inflections', should not be taken to imply any specific syntactic theory.

Switch-reference is also marked on subjunctive noun clauses (which are also often clauses of purpose), in which case a separate set of morphemes is used: **-ngapaj-** (SS) and **-chun-** (DS), as in examples (3) and (4).

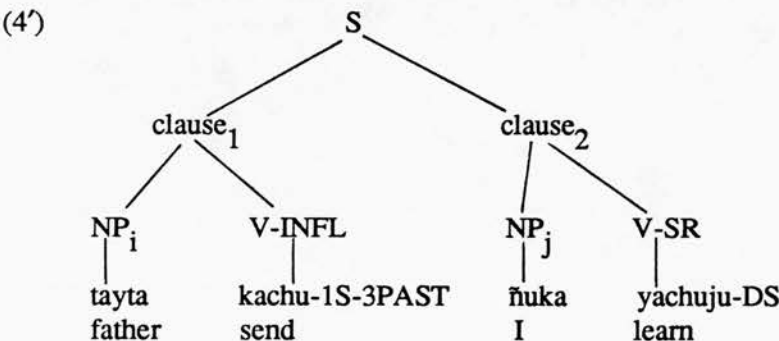
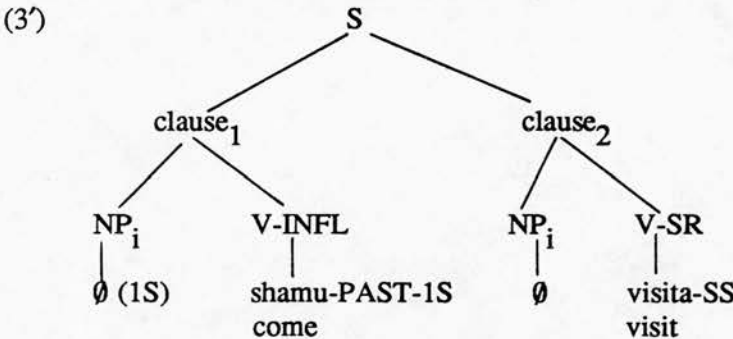
- (3) Utavalu-man shamu-rka-ni ñuka mama-ta visita-ngapaj
 Otavalo-to come-PAST-1S my mother-ACC visit-SS

I came to Otavalo to see my mother.

- (4) Tayta Kitu-man kacha-wa-rka ñuka chaypi yachuju-chun
 father Quito-to send-1S-3PAST I there learn-DS

Father sent me to Quito to study there.

Again, these clearly fit the definition of canonical switch-reference given in chapter 1, except that whereas the adverbial clause construction in examples (1) and (2) manifests the typical order of marked followed by controlling clause, the subjunctive noun clause construction may also manifest the reverse and less common order.



Note that according to Cole (1982, 1983) and Jake (1985), both switch-reference constructions in IQ involve subordinate clauses, although this is not represented in the

schematic representations above. However, as we saw in chapter 1, this is not a necessary characteristic of switch-reference systems crosslinguistically. The unexpected SS marking to be described in this section is not restricted to subordinate marked clauses. Later in this section we will see examples from Amele where switch-reference is used to set up 'clause-chaining' constructions, in which a number of dependent clauses, with non-finite 'medial' verbs, are followed by a final clause with a finite verb carrying the tense, aspect and polarity for the entire chain. In such constructions, the relationship between the clauses is more like coordination than subordination (for evidence of this, see Roberts 1988, and chapters 1 and 5 of this thesis). However, although the marked clauses in IQ are subordinate rather than medial, they do contain non-finite verbs and are semantically dependent on the controlling clause for tense. It is also a characteristic of IQ subordinate clause verbs that they lack the subject and object agreement markers which occur in main clauses.

Before we go any further, it is necessary to say a few words about how we define 'subject' in IQ. IQ is a Nominative-Accusative language, and its subject nominals have the following morpho-syntactic properties:

- (i) They take Nominative rather than Accusative case marking (zero-marking rather than affixation with *-ta*).
- (ii) They control agreement on the verb in main clauses. (Direct objects which are first person singular also trigger an agreement morpheme, *wa*, on the verb.)

Subjects are further defined as controlling switch-reference between clauses, but for obvious reasons this criterion is of little use to us.

Subjectless constructions in Imbabura Quechua

IQ has an interesting set of constructions which have been called 'subjectless' constructions.² The IQ 'subjectless constructions' correspond to types of constructions which in other languages are called 'impersonal constructions': in the remainder of this chapter I will use the term 'impersonal construction' in a general way which includes the IQ subjectless construction as well as other types of construction to be more fully

² Jake (1985) calls them 'inversion constructions', and sometimes 'unaccusative clauses'; both terms are from Perlmutter (1978), who analyses such constructions as derived unaccusatives (see Perlmutter 1978:179). More on this analysis below.

identified below. The IQ subjectless constructions have the following characteristics:

- (i) The clause may be transitive or intransitive, but in either case it will contain an 'experiencer' nominal, which is marked with Accusative case, and which triggers only object agreement (if any) on the verb.³
- (ii) If the clause is transitive, there will also be another Accusatively marked nominal.
- (iii) The verb is invariably marked with third person singular 'subject' agreement, regardless of the person and number of either of the two NPs.
- (iv) This type of construction is obligatory for some verbs and optional for others.

Example (5) is a case where it is optional. Here we have the desiderative construction formed by the affixation of the morpheme *-naya-* to the verb; *-naya-* can be affixed to any verb, and to some nouns denoting ingestibles. In (5a) *jari-ka* is a normal subject NP with Nominative (zero) case marking. The topic marker *ka* can cliticise to any constituent in a main clause, but never occurs in subordinate clauses. (5b) illustrates the 'subjectless' option, with both NPs marked for Accusative case.⁴

- (5) a. *Jari-ka* *aswa-ta* *ufya-naya-n*
 man-TOP beer-ACC drink-DESID-3

The man wants to drink beer.

- b. *Jari-ta-ka* *aswa-ta* *ufya-naya-n*
 man-ACC-TOP beer-ACC drink-DESID-3

Other constructions which exhibit an optional 'subjectless' variant, are other desiderative verbs such as *muna-*, 'want', *falta-*, 'need', and *gushta-*, 'like', and a few verbs with 'cognitive' or 'aspectual' meaning, such as *(yu)ya(ri)-*, 'seem, think', *chaya-*, 'arrive, have to begin' and *tuku-*, 'happen, become'. See example (6), with the verb *muna*, 'want'. In

³ I use the terms 'agent' and 'experiencer' in the sense of the particular semantic or thematic role played by the participant referred to by the NP in the situation described by the clause; I am aware that these concepts require a more precise definition but I will not go into this here. I also talk more generally about the 'degree of agentivity' of a NP or the referent of a NP; this is a separate though related notion and does not necessarily imply the existence of a set of semantic/thematic roles assigned to participants.

⁴ In addition to Nominative and Accusative cases, marking subjects and direct objects, there is a Dative case which marks indirect objects, and other case suffixes marking oblique relations. See Jake (1985: 21ff.) So it is not simply the case that the experiencer nominal in a subjectless construction is 'non-Nominative'; it is specifically marked as a direct object.

(6a), the experiencer nominal has Nominative (zero) case marking, and triggers subject agreement on the verb, thus here it is a normal subject. In (6b), it has Accusative case and triggers object agreement marking on the verb, so here it is direct object.

- (6) a. Nuka-ka aswa-ta muna-ni
 I-TOP beer-ACC want-1S

I want some beer.

- b. Nuka-ta-ka aswa-ta muna-wa-n
 I-ACC-TOP beer-ACC want-1S-3

With the exception of the *-naya-* construction, the desiderative, cognitive and aspectual predicates which optionally allow the subjectless construction are also predicates which may take sentential complements, functioning as subject or object depending on the verb. These sentential complements are either subjunctive noun clauses of the kind we have already seen, or nominalised subordinate clauses (which do not have switch-reference marking). The complexities of IQ sentential complementation are not important to the argument of this section, but since one or two examples with sentential complements will be given below, see example (7) to illustrate their structure. In (7) the verb *muna-*, 'want', appears with a sentential object complement which is a nominalised subordinate clause. It appears between the main clause subject, *nuka^{-ka}* and the main verb. The subordinate verb is marked with the Accusative case marker *-ta*. The subject of the subordinate clause is *kan*, which has Nominative case.

- (7) Nuka-ka [kan shamu-na-ta] muna-ni
 I-TOP [you come-FUT-ACC] want-1S

I want you to come.

So far we have seen examples of a number of predicates which optionally take the subjectless construction. These fell into two main classes: the *-naya-* desiderative construction, and a range of desiderative, cognitive and aspectual predicates. We now come to the second major type of example, where the subjectless construction is obligatory. The subjectless construction is obligatory with all physical experiencer predicates, as in (8) with the predicate *nana-*, 'hurt'; others include *yarja-* 'hunger', *rupa-* 'burn', *raura-* 'itch,

burn', *chiri*- 'feel cold'.⁵

- (8) a. Nuka-ta-ka uma-ta nana-wa-n-mi
 I-ACC-TOP head-ACC hurt-1S-3-WIT

My head hurts.

- b. *Nuka-ka uma-ta nana-ni-mi
 I-TOP head-ACC hurt-1S-WIT

The usual account given for all these impersonal constructions (cf. Jake 1985) is that, superficially at least, they simply 'lack' a subject, or at best have a dummy subject (like English expletive *it* in *it is raining*), except that it has zero phonological realisation. There is no nominal with Nominative case marking, and the subject agreement on the verb is a default and invariant third person singular.

More specifically, Jake (1985) proposes a Relational Grammar analysis in which the experiencer nominal is an initial subject NP which loses its status as subject and (eventually) becomes a direct object; an 'empty' dummy subject is inserted directly to fill the subject position at surface structure and prevent any other NP from appearing as surface subject. In other words, at some intermediate underlying level, these constructions are 'derived unaccusatives', where an 'unaccusative clause' is defined by Perlmutter (1978) as a clause which has an underlying direct object but no underlying subject.⁶

The obvious question to ask is, if these clauses have no (real) subject, and if switch-reference functions to indicate the referential relation between the subjects of two clauses, what happens to switch-reference marking when one of the two clauses is a 'subjectless' construction of this kind? The answer is, that SS marking is used.⁷

This seems to be true of both adverbial and subjunctive noun clause constructions. However, Cole (1982) and Jake (1985) are in disagreement here. Jake gives examples of

⁵ All the physical experiencer examples given in the literature, involve inalienably possessed body parts.

⁶ Jake claims that the IQ constructions provide evidence for Perlmutter's (1978) 'Unaccusative Hypothesis' and other universal principles which he proposes. I will not explore the details of this analysis or alternative syntactic analyses here. For more discussion, see chapter 5.

⁷ I will henceforth assume that clauses of the kind in question simply lack a subject rather than postulating an empty dummy subject. At this stage this is purely for convenience of exposition of the argument and does not represent a theoretical choice on my part. Note that if one does adopt the position that these clauses contain an empty dummy subject, one has to explain not why we get SS marking when one of the clauses lacks a subject, but why we get SS marking when one of the clauses has a subject which is a 'dummy', i.e. a purely syntactic element with no semantic content.

unexpected SS marking involving both kinds of construction, whereas Cole claims that it occurs only with the subjunctive noun clause kind of switch-reference; he says that in adverbial clauses the expected DS marking occurs. Dialectal variation may be the origin of this discrepancy. I follow Jake since she offers a more organised and comprehensive discussion of this particular topic in IQ grammar.

Logically, either the marked or the controlling clause in a switch-reference relation can be impersonal, or even both. In almost all the examples to be considered in this section, it is the controlling clause which is impersonal. Cole (1982) claims that in any case in which a switch-reference relation holds between an impersonal marked clause and a normal controlling clause, the expected, DS marking occurs. It does seem likely that this is a universal tendency, although not enough data has been considered as yet to say this with any certainty. If it is, it represents an asymmetry which is rather surprising and requires explanation. Certainly in Amele, a clause chaining language, an impersonal controlling clause may itself be marked for switch-reference with respect to a following clause, and in such cases DS marking is always used.⁸

So, in examples (9)-(11), with the *-naya-* desiderative construction, the controlling clause in each case contains a predicate which as we saw optionally allows the use of the 'subjectless' type of impersonal construction. In the (a) examples in (9) - (10) this option does not occur, we have a normal Nominatively marked subject, which is coreferential with the subject of the marked clause, and as we would expect SS marking occurs. In (9b), (10b) and (11), the impersonal construction is chosen, the controlling clause strictly speaking lacks a subject, the experiencer nominal which was Nominatively marked in the alternative version of the examples is now Accusatively marked - and yet we still have SS marking. Note that while in each case the controlling clause contains a subjectless construction, the marked clause is adverbial in (9) and (11) and a subjunctive noun clause in (10).

⁸ Jake (1985) gives two examples which do not conform to this generalisation. Both of these are quoted below, as examples (16)-(18). Both involve weather verb constructions in the marked clause. There is a certain amount of indeterminacy in the IQ literature over to what extent unexpected SS marking is required or is merely one option. Jake suggests that both SS and DS options are available for adverbial clauses in only one place, in the discussion of one of the examples mentioned (1985:35). Unexpected SS marking seems to be obligatory to at least some extent, i.e. at least in the subjunctive noun clauses, and possibly in all cases when it is the controlling clause which is impersonal; i.e. in the vast majority of cases.

- (9) a. Trabaja-shpa-ka kan-ka miku-naya-n-llu
work-SS-TOP you-TOP eat-DESID-3-Q

When you work, do you like to eat?

- b. Trabaja-shpa-ka kan-ta-ka miku-naya-n-llu
work-SS-TOP you-ACC-TOP eat-DESID-3-Q

- (10) a. Miku-ngapaj ñuka wasi-man ri-naya-n-mi
eat-SS I house-to go-DESID-3-WIT

I would like to go home to eat.

- b. Miku-ngapaj ñuka-ta-ka wasi-man ri-naya-n
eat-SS I-ACC-TOP house-to go-DESID-3

- (11) Nuka chagra-pi trabaja-shpa ñuka-ta puñu-naya-n
I field-in work-SS I-ACC sleep-DESID-3S

When I work in the field, I want to sleep.

(12) is a parallel example, but with one of the obligatorily 'subjectless' physical experiencer predicates in the controlling clause. The marked clause is of the adverbial type.

- (12) Nuka chagra-pi trabaja-shpa nuka-ta uma-ta nana-wa-n-mi
I field-in work-SS I-ACC head-ACC hurt-1S-3-WIT

When I work in the field, my head hurts.

(13) is an example where the controlling clause contains the desiderative verb *falta*, 'need', and the marked clause is a sentential object complement, subjunctive noun clause. The subject of the subordinate clause has been omitted; recall that IQ is a pro-drop language. In (13a) the experiencer nominal, *ñuka-ka*, appears as subject of the controlling clause, and the verb of the subordinate clause has SS marking. In (13b), the controlling clause appears as a subjectless construction, with the experiencer nominal taking Accusative case and triggering object agreement on the main verb, yet the subordinate verb is still marked for SS.⁹

⁹ I could find no examples in the literature where the controlling clause was a construction such as (6) above, i.e. with a desiderative, cognitive or aspectual predicate other than a *-naya-* marked verb, but with non-sentential complements. Clearly, constructions in which the switch-reference marked clause is a sentential complement of the controlling clause are interestingly different from the other types of switch-reference relation we have examined and demand special consideration to determine whether there is any interaction between switch-reference marking and other syntactic phenomena such as 'Equi' or control. Given the numerous examples which are *not* of this type, however, the generalisations to be made below still hold.

- (13) a. Nuka-ka [sara-ta tarpu-ngapaj] falta-ni
I-TOP [corn-ACC plant-SS] lack-1S
- I need to plant corn.
- b. Nuka-ta-ka [sara-ta tarpu-ngapaj] falta-wa-n
I-ACC-TOP [corn-ACC plant-SS] lack-1S-3

The use of SS marking in examples (9b), (10b), (11), (12), and (13b) seems unexpected or 'aberrant' because of two assumptions: (i) that the controlling clauses in these examples do not contain an overt subject NP and (ii) that switch-reference indicates the reference relation between subjects, as defined in Hypothesis 1. There are a number of possible explanations one could propose for this apparently aberrant use of SS, which shall be considered in turn.

The first two possible explanations both attempt to preserve both of these assumptions, by treating the examples in question as exceptional, either lexically or structurally.

(a) These constructions are lexically governed exceptions to the general rule of switch-reference marking. For example, I mentioned in chapter 1 reports from a number of languages of particular verbs which exceptionally are marked in the lexicon as taking only clauses with SS marking or only clauses with DS marking (see for example Austin 1980:17 on Diyari). Perhaps we are dealing with verbs which are lexically marked exceptions here.

There are a number of problems with this kind of explanation. The verbs mentioned by Austin - *wani*-, 'to begin', *wanyja*-, 'to try', *yatha*-, 'to tell' and *nganka*-, 'to make, cause' - didn't just require SS or DS marking regardless of coreference facts on any particular occasion of use. Rather, some verbs constrained the subject of the subordinate clause to be coreferential with their own subject, in which case SS marking was required, while others constrained the subject of the subordinate clause to be coreferential with a non-subject argument of the verb, in which case DS marking was required. Thus no cases of aberrantly used SS or DS marking could arise. Furthermore, in the IQ case the subjectless construction is optional for all but the physical experiencer predicates, and to say that the optional predicates are lexically marked to take SS subordinate clauses ignores the fact that the SS marking is covered by the general rule normally, and is atypical only when the subjectless option is taken. Such an account would miss the generalisation that the unexpected SS marking is due to the subjectless construction, or at best, to other shared

syntactic/semantic properties of the verbs. Finally, although some such account might work for the subjunctive noun clause type of switch-reference, it is difficult to see how it would work for the adverbial clause type, where the marked clause is not lexically subcategorised for by the controlling verb. Similar phenomena are found in Amele where the clauses are in the much looser chaining relationship. For these reasons, it seems better to seek a more principled explanation.

If more evidence is needed on which to rule out this proposal, it is provided by examples (14)-(16) below, which confirm that the use of a predicate that requires or allows the subjectless construction is not in itself a guarantee that SS marking will be used. These examples show that in transitive impersonal clauses of the kind we have been looking at, the non-experiencer nominal, i.e. the 'original' direct object, can 'ascend' to subject position. This is what has happened in example (14) below, which is a subjectless construction with a physical experiencer predicate.¹⁰ Examples (15) and (16) show that when such a clause appears as the controlling clause in a switch-reference construction, DS marking is required (15a is a repeat of 12), as we would expect. So these examples represent a third variation: the experiencer nominal has Accusative case marking and triggers object agreement on the verb, as in the subjectless constructions considered above, but the clause no longer lacks a subject; the non-experiencer nominal now has all the characteristics of subjecthood including Nominative case marking and control of subject agreement on the verb. Thus in (15b), the original direct object, *uma-ta* in (15a), has been promoted to subject, *uma-ka*; since it is clearly not coreferential with the subject of the marked clause, *ñuka-ka*, DS must be used.¹¹

- (14) *Uma-ka* *nana-wa-n-mi*
 head-TOP hurt-1S-3-WIT

¹⁰ In this particular case the experiencer nominal has been omitted; cf. the exactly parallel: *Nuka-ta chaki nana-wa-n*, 'My foot hurts', where both nominals are overtly realised, and the original direct object *chaki* has been promoted to subject.

¹¹ (16) is a rather complicated example, since it involves sentential complements. Both (16a) and (16b) are considered by Jake (1985:224) to derive from an original sentence [*Nuka-ta uma nana-chun*] *tuku-shka-mi*, where the verb *tuku-* has a sentential complement which is a subjunctive noun clause, and the subjunctive noun clause is a subjectless construction in which the non-experiencer nominal, *uma*, has lost its original Accusative marking and been promoted to subject. In (16a), this nominal has subsequently ascended out of the subordinate clause to become the subject of the main clause; hence it can now take the topic marker, which cliticises to main clause constituents only. In (16a), then, SS marking is used because both clauses are understood to have the subject *uma(-ka)*. In (16b), it is the experiencer nominal which has ascended out of the subordinate clause, in which it was direct object, to become main clause subject, but here DS marking must be used because *uma* remains the subject of the subordinate clause.

My head hurts.

- (15) a. Nuka chagra-pi trabaja-shpa ñuka-ta uma-ta nana-wa-n-mi
I field-in work-SS I-ACC head-ACC hurt-1S-3-WIT

When I work in the field, my head hurts.

- b. Nuka chagra-pi trabaja-jpi uma-ka ñuka-ta nana-wa-n-mi
I field-in work-DS head-TOP I-ACC hurt-1S-3-WIT

- (16) a. Uma-ka tuku-shka-mi ñuka-ta nana-ngapaj
head-TOP happen-PRF-WIT I-ACC hurt-SS

My head happens to hurt.

- b. ñuka-ka tuku-shka-mi ka-ni uma nana-chun
I-TOP happen-PRF-WIT be-1S head hurt-DS

(b) The second possible explanation would be to say that the examples in question involve the switch-reference system 'skipping' a clause - that is, simply ignoring it and treating the clause after it as its controlling clause - perhaps just because the clause does lack a subject and so cannot participate in switch-reference marking.

This explanation has in fact been proposed for such constructions, in particular in work on the 'clause-chaining' languages of Papua New Guinea, such as Amele, where long chains of switch-reference marked clauses are involved (see Roberts 1987:299, where he discusses work by Longacre 1972, Litteral 1972, West 1973, Thurman 1975, Davies 1981, and Foster 1981). Such an explanation does not work for any of the languages considered here (although it may do for the languages discussed by the researchers cited), for two reasons. First, in IQ the switch-reference constructions involve just two clauses, with no clause chaining, and in Amele as well, the sentence may contain only two clauses, so that it is not possible for switch-reference to be 'skipping' over the second and referencing a third. Secondly, in Amele, the so-called 'skipped clause' (the impersonal construction) may itself be marked for switch-reference with respect to the following clause. (Examples of this will be given below, eg. (22).)

Given the failure of these two proposed explanations, it seems that it is not going to be possible to preserve both of the assumptions mentioned above by invoking lexical or structural exceptionality. The next possible explanation attempts to preserve the definition of switch-reference given in Hypothesis 1 by arguing that the first assumption, that the

impersonal constructions lack subjects to be related by switch-reference, is wrong.

(c) The experiencer NP is actually the 'subject' at some less superficial level of syntax (i.e. it is 'deep' or 'logical' subject), and it is at this level that switch-reference marking is determined.

This kind of explanation would capture the fact that in the examples in question, there is an experiencer nominal which is not (surface) subject but which is coreferential with the subject of the marked clause. However, this explanation too must be rejected. To start with, switch-reference marking is generally responsive only to 'surfacey' grammatical relations, eg. it is the surface subject in a passive construction which will control switch-reference. So subjectless constructions would be unique in this regard. More importantly, examples (14)-(16) above show that impersonal controlling clauses are not unique in this way: when a subject nominal is present at surface structure, due to promotion of the original direct object, switch-reference marking is determined on the basis of the referential relation between this nominal and the surface syntactic subject of the marked clause. A final argument against this proposal is that some of the types of impersonal clauses which we shall go on to consider in this paper, simply lack an experiencer nominal which could be involved in coreference and which could be seen as an underlying subject.

Examples (15) and (16) are also evidence against various possible proposals, related to (c), which all assume that the definition of switch-reference given in Hypothesis 1 is correct (i.e. that the switch-reference markers identify reference relations between subjects), and take as the problem determining the relevant notion of subject. For example, another version of the argument given under (c) might say that although the experiencer nominals in question behave in some respects unlike subjects (for example, morphologically - in that they receive Accusative case marking - and in the kind of verbal agreement which they trigger), in other respects they do behave like subjects. So we could make a distinction between different kinds of subjecthood (say, morphological and syntactic) which is unrelated to postulating different levels of structure. This kind of account is argued for by Cole (1982) and is given some credibility by discussions of 'quirky subject case marking' which have appeared in the literature (for example, by Zaenen & Maling 1984, who even hint at a distinction between true unaccusative constructions and mere quirkily marked subjects). Apart from the evidence of examples (15) and (16) above, the problem with this kind of account is that the only 'other respects' in which the experiencer nominals behave like subjects rather than objects, is that they seem to trigger switch-reference marking: and

so we find ourselves caught up in a circular argument.¹²

Given the failure of this argument, the most likely hypothesis remains that the impersonal clauses lack subjects for the switch-reference morphemes, as defined, to relate. The rejection of this argument also leaves us with switch-reference reacting to or marking a relationship between the two clauses as they appear in 'surface syntax' rather than at some underlying level.

As far as I can see, the remaining possible explanations for the unexpected SS marking all involve rejecting the second assumption, that is, we have to reject our initial hypothesis (Hypothesis 1) about what switch-reference marking does. On the basis of the preceding argument, we can construct two new hypotheses about what switch-reference does, both of which involve relaxing our original hypothesis:

HYPOTHESIS 2:

SS indicates that there is no subject nominal in the controlling clause which has disjoint reference with the subject nominal in the marked clause.

DS indicates that there *is* a subject nominal in the controlling clause *and* that it has disjoint reference with the subject of the marked clause.

Note that the definition of SS here covers two cases: the case where there is no subject nominal at all, and the case where there is a subject nominal and it is coreferential with the subject of the marked clause.

HYPOTHESIS 2':

SR is not a relation between *syntactic subjects*, but between *agent/experiencers*. The switch-reference pivot is the agentive nominal in the clause, or if there is no agent, the experiencer nominal, and SS marking indicates that the pivots are coreferential while DS marking indicates that they have disjoint reference.

These two hypotheses each focus upon one of the two obvious generalisations which one could make about the data presented so far: one is that all the controlling clauses in unexpected uses of SS lack a subject, and the other is that all the controlling clauses in these uses contain an experiencer nominal which is coreferential to the subject of the

¹² However, this is probably to dismiss too lightly the difficulties of achieving an adequate definition of subject vis-a-vis switch-reference marking; see the concluding remarks to this section.

marked clause.

Hypothesis 2 is roughly as proposed by Jake (1985). It amounts to an acknowledgement of a fairly obvious point: if there is no subject nominal in the controlling clause, then there is no disjoint subject in the controlling clause, and we might have taken our previous definition of SS to include this case anyway. Jake presents this modification as not representing a radical change from Hypothesis 1, but note that it does involve an interesting change in markedness. What we are trying to do is to accommodate a case which does not strictly speaking fit the earlier definition of either SS or DS: the case where there is no subject nominal in the controlling clause. There is no reason a priori why one would think this case would be more likely to count as SS rather than DS. What tips the balance one way or the other will be a decision about which of the two counts as default. As defined in Hypothesis 1, SS is the more restricted option and DS could be seen as a default; in Hypothesis 2, DS is the more restricted case - we have evidence that SS is the default. The modification proposed in Hypothesis 2 is also important because it means that switch-reference is no longer defined as a relation between subject NPs, but rather is seen as a relation between clauses. This may seem to be an obvious point given that switch-reference is marked on the verb rather than on the subject NP, but in fact switch-reference has consistently been treated in the literature as a semantic relation between subject NPs, even if it is marked on the verb in what has been called a 'violation of categorial iconicity' (Haiman (1983): the Principle of Categorial Iconicity says that semantic distinctions should be marked on the categories to which they pertain). See chapters 1 and 3 for some other reasons why this analysis is incorrect and switch-reference should be seen as a semantic relation between clauses which is marked on the head of the clause.

Hypothesis 2' is given here because it has been proposed elsewhere as an alternative definition of switch-reference (most notably by Foley & Van Valin 1984), and the data we have discussed so far seems to go some way towards supporting it: it would account for why all the 'unexpected' uses of SS mentioned so far occur when there is coreference between an agent in the marked clause (which also happens to be syntactic subject) and an experiencer in the controlling clause (which incidentally is not syntactic subject). Although it differs from the family of explanations considered under (c) above (and rejected), in that it claims that it is our analysis of switch-reference which is wrong rather than our definition of subject, it is similar to them in its effect, and it is readily disproved using similar arguments. First, examples like (15b) and (16b) show that coreference between agent/experiencers, regardless of their grammatical functions, is not **sufficient** to trigger SS marking: in both these examples, this condition is satisfied, but DS marking occurs.

Secondly, as was hinted in the discussion of explanation (c) above, unexpected SS marking occurs when the controlling clause is impersonal (lacks a subject) but does not contain an agent/experiencer nominal. So coreference between agent/experiencers is not **necessary** to trigger SS marking. This is the case with weather verb constructions in IQ, as in example (17). The weather verbs represent the only other obviously 'subjectless' construction in IQ. They always appear with third person singular subject agreement marking. In (17b) the marked clause is a weather verb construction, and either SS or DS marking is possible.

- (17) a. Tamyá-ju-n-mi
rain-PROG-3-WTT

It's raining.

- b. Tamyá-ju-shpa/jpi-ka wawa-kuna mana shamu-nga-chu
rain-PROG-SS/DS-TOP child-PL NEG come-3FUT-NEG

If it rains, the children won't come.

In (18), again the marked clause is a weather verb construction, but this time with the subjunctive noun clause type of switch-reference marking rather than the adverbial clause type. Once again both SS and DS marking ^{are} possible. Note that in this case although the controlling clause does have an overt subject nominal, it is also an inanimate weather noun.

- (18) Tamyá-gri-ngapaj/chun waira fuku-shka-mi
rain-INCHO-SS/DS wind blow-PERF-WTT

The wind blew enough for it to rain.

Incidentally, apart from these difficulties for Hypothesis 2', it also predicts other cases which do not seem to occur. If switch-reference were a relation between agent/experiencers, regardless of their grammatical function, we would expect to find examples where the subjects of the two clauses are coreferential non-agent/experiencers, and DS is used instead of SS. We might also expect examples where the subject of the marked clause is an agent, and the subject of the controlling clause is an experiencer, and the two are noncoreferential, but SS is used because the controlling clause contains an agentive NP in non-subject position which is coreferential with the agent in the marked

clause.¹³

These arguments suggest that Hypothesis 2 is more plausible than Hypothesis 2'. As far as the evidence from subjectless constructions in IQ goes, Hypothesis 2 does indeed seem to accurately predict the data. In the remainder of this section we shall consider two questions. First, is this definition of switch-reference in IQ generalisable to other switch-reference languages? This will involve seeking out, on the one hand, subjectless constructions in other switch-reference languages, and on the other hand, aberrant uses of SS in other switch-reference languages. Second, is there any other evidence from switch-reference constructions in IQ which has a bearing on whether we should accept or reject Hypothesis 2?

Before we do so, note in summary of the preceding discussion that so far we have considered two types of case of unexpected use of SS marking as listed below.

(i) the controlling clause has no subject but has an experiencer nominal, with some other grammatical relation, which is coreferential with the subject of the marked clause (the subjectless construction).

(ii) the marked clause has no subject, indeed no overt nominal arguments at all, and hence there is no possibility of coreference with an argument in the controlling clause, which may have an agentive or non-agentive subject (weather verbs).

Impersonal constructions in Amele

At this point it is useful to consider some data from Amele, a non-Austronesian language spoken in Papua New Guinea (see Roberts 1987, 1988). In Amele, unexpected SS marking (i.e. SS marking where strictly speaking there is disjoint reference between the syntactic subjects) occurs with four types of controlling clause. The first two types are exactly parallel to the two types of example found in IQ.¹⁴

First, unexpected SS marking occurs with controlling clauses containing what are called

¹³ Aberrant uses of DS marking *do* occur, but not under the circumstances described. They will be discussed in later sections of this chapter.

¹⁴ The phenomena to be presented below along with additional examples of the same kind are discussed by Roberts 1987: 63, 67, 163, 166, 204, 220f., 233, 280-1, 299ff., 315ff.

'impersonal verbs' by Roberts: these verbs are a special type of construction which is reminiscent of the 'subjectless construction' in IQ, and in particular of the obligatory use of the subjectless construction with physical experiencer predicates in IQ. (19) is an example of an impersonal clause in Amele: the clause consists of an experiencer NP which must come in initial, 'topic' position, and which triggers object agreement; one of a set of nominals describing physical experiences, some of which only ever occur in these constructions; and finally, a verbal element which consists simply of the object agreement marker and obligatory third person singular subject agreement marking, followed by tense: there is no lexical verb.¹⁵

- (19) Ija wen te-na-Ø
 1s hunger 1s-3s-Pres

I am hungry.

As (20) shows, when one of the impersonal verbs is used in relation with a switch-reference marked clause, SS is used, despite the fact that the clauses apparently have disjoint subjects.¹⁶

- (20) Ija bi-m-ig wen te-i-a
 I come_up-SS-1s hunger 1s-3s-TodP

I came up and I became hungry.

Secondly, in Amele as in IQ, unexpected SS marking occurs with weather verbs. See example (21).

¹⁵ The structure of the final inflectional element in these examples is: OBJECT AGREEMENT + SUBJECT AGREEMENT + TENSE. The present tense is zero marked for the third person singular subject. In all the examples I have seen, the third person singular subject agreement is actually consistent with agreement being triggered by the second nominal. There is evidence that this is not the case, as I shall show when these constructions are discussed in more detail in chapter 5.

¹⁶ Some remarks were made earlier about difficulties surrounding the notion of 'subject', and this is discussed further below: in particular, work on typological linguistics as well as theories such as Role and Reference Grammar assume that subject properties may be assigned to more than one NP in the clause, and divide into different types accordingly. In the Amele impersonal construction there is more reason to adopt this kind of approach than there is in the IQ subjectless construction; the usual subject identifying properties in Amele are just word order and triggering of verbal agreement marking (Amele nominals are not distinguished by case marking): subjects occur in initial, 'topic' position and trigger subject agreement on the verb. (Again, triggering of SR marking must be ruled out as a subject criterion for the purposes of this argument.) So the experiencer nominal in the impersonal construction in Amele has one of these properties (subject position) but not the other (it triggers object agreement rather than subject agreement on the verb). And it could be seen as triggering switch-reference marking.

- (21) Ija co-cob-ig wa hedo-i-a
 I SIM-walk-1s_SS water finish-3s-TodP

As I walked along the rain stopped.

Note that switch-reference marking in Amele is morphologically rather complicated; if the temporal relation between the events described by the two clauses is one of sequentiality, the SS marker is *-m(e)-* and the DS marker is *-c(e)-* (and special subject agreement marker paradigms are used); but if the temporal relationship is one of simultaneity, as in (21), both SS and DS marking involves reduplication of part of the verb, and they are distinguished from one another by the special subject agreement marker paradigms which are selected.¹⁷

In the weather verb clause in example (21), the word *wa*, 'water', occurs, and it could be argued that this is the subject nominal and that it triggers third person singular subject agreement. This is possible, and it is also possible that *wa* is part of a compound verb (which are ubiquitous in Amele); on the basis of the data and discussion presented in Roberts (1987, 1988) it is impossible to tell. In either case, SS marking is unexpected, and if *wa* is a normal subject nominal, this case will be subsumed under a type to be discussed below involving inanimate subjects.

In addition to these two types of unexpected SS marking, at least the first of which is arguably 'subjectless', we have two other kinds of example involving unexpected SS marking in Amele, and both of these do involve normal subjects. Our third type of example in Amele, then, is where the subject of the controlling clause is an inalienably possessed body part, the possessor is referred to elsewhere in the clause, and the subject of the marked clause also refers to the possessor. See example (22).

- (22) Ija ta-taw-ig ija am-i wal-do-i-a
 I SIM-stand-1s_SS I eye-1s spin-3s-3s-TodP

As I stood my eye(s) spun (= I became dizzy).

So again we have a non-subject experiencer which is coreferential with the subject of the marked clause, as in the subjectless constructions in IQ, but in this case we also have another NP which seems to be a completely normal subject, although it also indirectly

¹⁷ Reduplication is also used to mark iterative aspect, but Roberts (1987: 252) says that the reduplication involved in switch-reference marking is distinguishable from this, i.e., (21) and (22) below do clearly involve switch-reference.

involves reference to this experiencer.

Finally, unexpected SS marking may occur when the controlling clause has an inanimate subject: in this case choice between SS and DS is possible according to whether or not the inanimate subject is presented as agentive. (I said above that if we analyse the weather verb construction as involving a normal subject, *wa*, then it would assimilate to this type, but this would not be strictly true if weather verbs necessarily required SS marking; I don't know whether this is so or not.) In example (23) below SS is used despite clearly disjoint subject nominals, and similarly in example (24) (from text). In (25) (also from text) DS is used; that is the sun is presented as being agentive. Note that the clause with the inanimate subject in (24), which is the second clause in the sentence, is itself marked as DS with respect to a following clause that has the same subject as the first clause in the sentence! This is despite the fact that there is still no new agent. In chapter 5, an explanation will be given for this asymmetry.

- (23) Age qa q-u-fe-ig cal m-igi-an.
 3p dog hit-PRED-SS/CD-3p dead become-3s-Fut

If they hit the dog it will die.

- (24) M-i he-du-me-i ceta wal me-ce-b
 put-PRED finish-3s-SS-3s yam ripe become-DS-3s
 ceta eu hun-i-me-i ...
 yam that dig_up-PRED-SS-3s ...

He finished doing that and then since those yams were ripe he dug them up ...

- (25) Uqa cabi na co-cob-on cam gagadic me-ce-b
 he garden to SIM-walk-3s_DS sun strong become-DS-3s
 uqa l-i-me-i cenal salu na us nij-en
 he go-PRED-SS-3s galip shade in sleep lie-3s_RemP

As he walked to the garden the sun became strong so he went and lay down in the shade of a galip tree and went to sleep.

To summarise, we have seen in Amele the following range of cases of use of aberrant SS marking. Examples analogous to the first two types of case occurred in IQ as well.

- (i) the controlling clause arguably has no subject but has an experiencer

nominal, with some other grammatical relation, which is coreferential with the subject of the marked clause (impersonal verbs).

(ii) the controlling clause has no subject and no other agent/experiencer nominal (weather verbs on the compound verb analysis of them, or as in IQ where they have no overt nominal argument).

(iii) the controlling clause *does* have a subject, but also has an experiencer nominal, with some other grammatical relation, which is coreferential with the subject of the marked clause (inalienably possessed body part examples).

(iv) the controlling clause *does* have a subject, which is not coreferential with the subject of the marked clause, but which is inanimate and presented (by virtue of the SS marking on the preceding clause) as nonagentive; the clause therefore contains no agent/experiencer.

If we think in terms of two possible characteristics of clauses; one being whether the clause has an overt syntactic subject, and the other being whether it has an agent/experiencer nominal, then we have seen unexpected uses of SS marking in all four logically possible combinations of these two parameters:

- | | | | |
|-----|-------------|-----------------------|--------------|
| (a) | has subject | has agent/experiencer | (type (iii)) |
| (b) | has subject | no agent/experiencer | (type (iv)) |
| (c) | no subject | has agent/experiencer | (type (i)) |
| (d) | no subject | no agent/experiencer | (type (ii)) |

We said at the end of the last section that Hypothesis 2 seemed like a reasonable account of the data we had looked at in Imbabura Quechua. However, it turns out not to work as a description of the Amele data, and hence would seem to have to be rejected also as a crosslinguistic generalisation. We saw that in examples of type (iv), where the controlling clause has an inanimate subject, both SS and DS marking was possible apparently dependent upon whether the speaker wishes to present the inanimate subject as being agentive or not. In fact in Amele it is possible to use DS marking in the other three types of impersonal construction as well (unlike in IQ) - but it has a causative effect, indicating that some unspecified agent is involved. So as in the inanimate ones, the use of DS indicates that there is agentivity associated with a protagonist in the following (controlling) clause: with the inanimate examples, this agentivity is associated with the inanimate subject referent, but in the other examples, it is attributed to some external and unspecified entity (type (iii) also has a subject nominal with which agentivity could be associated, but this is

the body part nominal, although it would not be odd for agentivity to be associated with some part of an entity's body and the entity as a whole to be treated as an experiencer).

Examples (26) - (28) illustrate the use of DS marking with causative import for types (i) (impersonal verb), (ii) (body part subject) and (iii) (weather verb) of impersonal constructions in Amele (type (iv) with the inanimate subjects was discussed above).

- (26) Ija be-ce-min wen te-i-a
I come_up-DS-1s hunger 1s-3s-TodP

I came up, and something made me hungry.

- (27) Ija ta-taw-igin ija am-i wal-do-i-a
I SIM-stand-1s_DS I eye-1s spin-3s-3s-TodP

As I stood something caused my eyes to spin.

- (28) Ija co-cob-igin wa he-do-i-a
I SIM-walk-1s_DS water finish-3s-TodP

As I walked along something made the rain stop.

Such examples are counterexamples to Hypothesis 2, because it predicts that any occurrence of DS will indicate that there is a subject nominal in the controlling clause and that this subject nominal has disjoint reference with the subject of the marked clause, but this does not seem to be how DS marking is functioning in these examples: in examples like (26) (at least), there is no clearcut subject nominal, and more importantly, DS does not seem here to be identifying a relation between entities referred to in the clauses in question, but rather it seems to be being used to generate an implication that some entity not otherwise referred to is agentively involved in the situation. This is clearly something of a functional extension of the DS marker, but the meaning which we give to it normally should help explain how such an extension is possible.

Given all of this evidence, the final proposed definition is formulated as Hypothesis 3 below. Crucially, it assumes that as well as a notion of subject, we need a notion of agentivity. Many SR languages manifest aberrant uses of the SS marker, and a large subset of these is predicted by Hypothesis 3. How these ideas relate to the differing theories of subjecthood referred to in passing above, will not be considered here. At present, I consider it of more fundamental importance to reiterate that whatever is going on in the

examples we have looked at, it is NOT simply coreference, which assumes first that both clauses have referential subjects, and secondly that they refer to the same thing.

HYPOTHESIS 3:

SS indicates that there is no new (i.e. disjoint) *agentive subject* in the controlling clause.

DS indicates that there *is* a new (i.e. disjoint) *agentive subject* in the controlling clause.

Note that under this modified definition it is still the case that the definition of DS is more restricted than that of SS, which covers the three cases:

- (i) cases where the controlling clause lacks a subject nominal;
- (ii) cases where the controlling clause does have a subject but it is not an agentive subject;
- (iii) cases where the both clauses have agentive subjects and these are coreferential.

Supporting data

This analysis is supported by data from a number of other switch-reference languages. In section 2.3 of this chapter we shall discuss data from Eastern Pomo (based on McLendon 1975, 1978), which differs from Amele and IQ in that it is a 'Split Ergative' language with what Dixon (1979) describes as 'Split' and 'Fluid' case marking of intransitive arguments depending on whether they are presented as grammatically agentive or not: in Eastern Pomo the SS marker indicates coreference and same agentivity value (either agentive or not) and the DS marker indicates either disjoint reference or difference in agentivity value or both. Related facts obtain in Northern Pomo (O'Connor & Caisse 1981) and in Barai (Olson 1978).¹⁸

Data which is closer to that in IQ and Amele apparently occurs in Old Japanese (Akiba

¹⁸ In addition to the references already given, there has been some discussion of weather verbs and inalienable possession in Langdon & Munro (1979) and D. Payne (1980) which should be followed up. Langdon & Munro indicate that languages vary in whether they take two weather verb clauses to have the same or different switch-reference pivots; Payne (p.98) shows that Chickasaw takes them to be the same. Payne (p.104) also discusses possession: in Chickasaw, DS is used when either or both pivot is an expression of inalienable or unmarked possession, and either SS or DS may be used when inalienable possession is involved. Gordon (1983) provides examples from Maricopa which suggest that when inalienably possessed subjects are involved switch-reference marking is nevertheless determined strictly on the basis of co/disjoint reference between surface syntactic subjects. Much comparative work remains to be done.

1977: esp. 612-3). The SS marker is *te* and the DS markers (which have the same form as certain case markers) are *ba*, *wo* and *ni*. Switch-reference marking occurs on non-final verbs in a coordinated string, or chain, of clauses, the last of which manifests full verbal inflection. Non-final forms of verbs (including the switch-reference marked forms) have different shapes according to the conjugation type of the verb: the capital letters I, U, URU, E and A in the glosses indicate particular conjugation types. As well as occurring before switch-reference marking, these conjugation type endings also occur before auxiliaries such as honorifics, and tense/aspect. There is unrestricted deletion of subject nominals. Akiba looked at the occurrence of switch-reference marking vis-a-vis reference relations in texts, and with respect to the text from which the examples are taken, *Taketori Monogatari* (dating from the beginning of the 9th century), he reports that 94% of uses of the morpheme *te* did in fact represent coreference of subjects, but that the remaining 6% represents cases where the subject of one clause was unclear or non-referential, as in expressions of time, distance, and weather, and in idiomatic expressions lacking an overt subject. In all these cases the clause is either devoid of a surface subject or the subject could never be definite (as in 'rain falls'). (29) - (31) give examples of expressions of time, distance, and weather respectively, and (32) is an example with an idiomatic expression. Unexpected uses of SS marking also occurred in cases where the subject nominal was an expression of inalienable possession, as in (33).¹⁹

- (29) Mi- ka bakari ar-i-te,
three day about be-I-SS

kog-i-kaher-i-tamah-i-n-u
row-I-return-I-HON-I-PERF-U

(He) rowed back home in about three days. (Lit. 'there was time about three days, and ...')

- (30) Umi goto ni aruk-i-tamah-u-ni, ito tooku-te, Tukusi no
sea every to go-I-HON-URU-DS very far-SS Tukusi GEN
no kata no umi ni kog-i-id-e-n-u
GEN area GEN sea to row-out-E-PERF-U

(He) went to every sea, and (it) was very far, and (he) rowed out as far as the area of Tukusi.

¹⁹ It is not clear why DS marking appears on the first verb in example (30); one would expect SS marking since the following clause is an expression of distance.

- (31) Sukosi hikar-i-te, kaze ha nao hayaku huk-u
a-little flash-I-SS wind TOP/SUB still fast blow-U

(The lightening) flashed a little, and the wind still blew fast.

- (32) Oya wo hazim-e-te nan to mo sir-a-zu
parent DO begin-I-SS what COMP even know-A-NEG

Beginning from (= including) (her) parents, nobody knew what (it was).

- (33) On-me ha siro-me ni-te, hus-i-tamah-er-i
HON-eye TOP-SUB white-eye be-SS lie-down-I-HON-I-be-U

(His_i) eyes were white eyes, and (he_i) was lying down.

Inanimate subjects in Imbabura Quechua

We have seen that Hypothesis 2 has to be ruled out for Amele, and hence also as a crosslinguistic generalisation. So at this point, we should return to the IQ data, as promised, to see whether there are any examples not already discussed which have a bearing on the adequacy of Hypothesis 2 for this language, and to see how our new definition, Hypothesis 3, stands up to the IQ data.

First, note that Hypothesis 2 subsumes Hypothesis 3 as a more specific case. Hypothesis 2 says that SS indicates lack of disjoint subject, and Hypothesis 3 says it indicates lack of disjoint agentive subject. Choice of Hypothesis 3 over Hypothesis 2 for Imbabura Quechua will be dependent upon finding examples with SS where there is a disjoint subject but it is not an agentive subject.

We saw in our earlier discussion of IQ, two of the four cases of aberrant SS marking which were identified in Amele. Type (iv), where SS could be used if the subject of the controlling clause was an inanimate and non-coreferential nominal, was not investigated: are there any comparable cases in IQ? It turns out that there are, but the data is interestingly complex. The problematic cases involve controlling clauses which contain one of the following:

- (i) non-weather verbs with dummy subjects
- (ii) inanimate subjects
- (iii) subjects of passive clauses

All examples are from Cole (1983), who claims (p. 8) that the pattern of unexpected SS marking to be described below is found only with the subjunctive noun clause type of switch-reference; analogous examples with the adverbial clause type, he says, require DS marking (note that this is compatible with his claim, mentioned earlier, that unexpected SS marking in subjectless constructions occurs only in subjunctive noun clauses). Examples are given in (34)-(37): as is clear from these, sometimes SS is used, sometimes DS, depending on the person of the subject nominals in a way to be described below. (34) and (37) are examples with a dummy subject in the controlling clause, (35) is an example with an inanimate subject, and (36) is an example with a passive construction, which in IQ involves two nominatively case marked NPs, and, Cole says, no 'real' subject. In all the examples, the symbol [.....] stands for a choice between the following: a 'zero' or omitted subject, which means arbitrary reference, or one of the pronouns *ñuka*, 'I', or *kan* 'you'.

- (34) a. Chishi-mi [.....] sachá-man ri-ngapaj
late-WIT forest-to go-SS

[.....] = *Ø*, *ñuka*, *kan* (ARB, I, you)

It is late for one/me/you to go to the forest.

- b. Chishi-mi Juzi sachá-man ri-chun
late-WIT José forest-to go-DS

It is late for José to go to the forest.

- (35) a. Chay kipi llashaj-mi ka-rka [.....] apa-ngapaj
that bag heavy-WIT be-3PAST take-SS

[.....] = *Ø*, *ñuka*, *kan* (ARB, I, you)

That bag was too heavy for one/me/you to carry.

- b. Chay kipi llashaj-mi ka-rka pay apa-chun
that bag heavy-WIT be-3PAST he take-DS

That bag was too heavy for him to carry.

- (36) a. Wawa-ka mama mikuchiy tukushka-mi
child-TOP mother fed became-WIT

ama [.....] kijari-ngapaj
not complain-SS

[.....] = Ø, ñuka, kan (ARB, I, you)

The child was fed by the mother in order that one/he/I/you not complain

- b. Wawa-ka mama mikuchiy tukushka-mi
child-TOP mother fed became-WIT

ama Juzi kijari-chun
not José complain-DS

The child was fed by the mother in order that José not complain.

- (37) a. Ali-mi [.....] Juzi-wan parla-ngapaj
good-WIT José-with speak-SS

[.....] = Ø, ñuka, kan (ARB, I, you)

It is good that one/I/you speak with José.

- b. Ali-mi pay Juzi-wan parla-chun
good-WIT he José-with speak-DS

It is good that he speak with José.

SS marking is used for any case *except* where the marked clause contains a third person subject which has disjoint reference from the 'dummy' or third person inanimate subject of the controlling clause. That is, SS is used if the subject of the marked clause refers to the speaker or hearer or to some arbitrary referent (the latter of course possibly including both speaker and hearer). DS marking is used if the subject of the marked clause refers to some individual other than speaker or hearer. The way this is described by Cole is to say that a person or animacy hierarchy is involved, of the kind which Michael Silverstein postulates (see Silverstein 1976); the figure in (38) encodes those aspects of such a hierarchy which would be relevant to describing the IQ data (this is a subset or version of the hierarchy which Silverstein proposes).

- (38) 1st
2nd > (non-agentive) 3rd
ARB

The reason why the qualification 'non-agentive' third person is used, is that not all first person, second person or arbitrary referents outrank all third person referents, as is shown by example (4) at the beginning of this section, repeated below: in this case without the qualification one would expect the first person subject of the marked clause to outrank the third person subject of the controlling clause, and SS marking to be used. Agentive third person subjects are on a par with those to the left hand of the arrow in the hierarchy.

- (4) Tayta Kitu-man kacha-wa-rka ñuka chaypi yachuju-chun
 father Quito-to send-1S-3PAST I there learn-DS

Father sent me to Quito to study there.

Cole then proposes the following definition of SR for Imbabura Quechua, at least for the subjunctive noun clause type of SR:

HYPOTHESIS 4:

SS is used if the subject of the marked clause is *higher* on the hierarchy than the subject of the controlling clause (this is taken to include the case where the two subjects are coreferential, since in such a case by definition the marked clause subject is highest).

DS is used in any other case; i.e. if the two subjects have disjoint reference AND the subject of the marked clause is not higher on the hierarchy than that of the controlling clause.

Notice that this hypothesis also covers all four cases that we identified in Amele. This hypothesis is not incompatible with Hypothesis 3, it is just more specific than it. Hypothesis 3 states that DS marking is used when the controlling clause has an agentive subject nominal, and this subject has disjoint reference from the subject of the marked clause. Hypothesis 4 states that DS marking will be used when the controlling clause has a subject nominal which refers to speaker or hearer or to some agentive third person, and where this subject nominal is thereby disjoint in reference from the subject of the marked clause. It seems very reasonable that subject and hearer should be seen as archetypical agents. So we could see Hypothesis 3 as a universal condition on the use of switch-reference markers, and Hypothesis 4 as a language-particular realisation of it, which makes it more specific by further specifying what is to be seen as more or less agentive. So Hypothesis 4 represents a language-particular marriage of two universal conditions. What is envisaged is similar to the typological treatment of relative clauses, where particular languages choose specific relative clause strategies which must nevertheless conform to

universal relative clause hierarchies.

Conclusion

In this section, 'unexpected' uses of SS marking in Imbabura Quechua, Amele and Old Japanese have been discussed, and it has been claimed that similar uses are found in a number of other switch-reference languages. All the cases considered were found to involve relations between clauses one of which involved an 'impersonal construction' of some kind, or had an inanimate subject NP. We saw that while in a few cases of unexpected SS marking it was the marked clause which was impersonal, in most cases the impersonal construction was in the controlling clause.

A number of different types of impersonal constructions were involved. In Imbabura Quechua we looked at three main groups of examples. First, we considered the 'subjectless construction', where no overt subject nominal is present in surface syntax, but there is an 'experiencer' nominal which is marked with Accusative case and may cause object agreement on the verb. Two main groups of predicates appeared in this construction: a set of predicates, which included the *-naya-* desiderative construction and other desiderative verbs, could optionally take the subjectless construction; and all physical experiencer predicates obligatorily took this construction. The second group of examples in Imbabura Quechua are weather verbs, which not only have no overt subject, but in fact have no nominal arguments whatsoever. Finally, we looked at a group of examples where the subject nominal in the controlling clause was either an 'empty' dummy subject, or a non-agentive inanimate NP, or the surface subject in a passive construction. In Amele, we looked at four groups of examples. First, examples with the Amele 'impersonal construction' which include physical experiencer predicates, and where an experiencer nominal triggers object agreement on the verb, and there is no clearly identifiable subject nominal. Second, weather verbs again. Third, examples where the subject nominal was an inalienably possessed body part, and an experiencer object nominal in the clause referred to the possessor. And finally, clauses with inanimate subject nominals. In Old Japanese, we looked at examples with weather, time or distance verbs; idiomatic expressions; and inalienably possessed body parts. Some of these types of example were ones where there were not two referring subject NPs available for the switch-reference relation to relate, and some involved cases where the subject nominals both referred, but to different 'degrees' of entity, in terms of their agentivity, or animacy.

We saw that there are two generalisations which immediately suggest themselves in looking at this data. First, in most of the cases in question although SS marking seems strictly speaking to be aberrant, since the surface syntactic subjects of the clauses are not coreferential, it is the case that there exists an experiencer nominal in the impersonal controlling clause with which the subject of the marked clause *is* coreferential. Secondly, in many of the cases in question, the impersonal controlling clause cannot really be said to have a surface syntactic subject at all (so that when we say the subjects of the two clauses are strictly speaking disjoint, this includes the case where they are disjoint by definition because one of the clauses has no subject).

Given these two generalisations, we considered a number of ways in which the canonical account of switch-reference could be modified so as to incorporate the unexpected uses of SS marking. A basic premise was that the unexpected uses of SS should not just be dismissed as exceptions, but that they have something interesting to tell us about the nature of switch-reference: this premise is supported by the fact that similar examples occur in geographically and genetically diverse switch-reference languages. The final proposal (Hypothesis 3) was that all the cases in which SS marking could be used were accounted for if we define SS as indicating only that there is no disjoint agentive subject in the controlling clause. This incorporates cases where there are coreferential agentive subjects; where the subject in the controlling clause is not coreferential but not agentive either; and where there is no subject in the controlling clause. The fact that in the latter case it is often found that the controlling clause contains a non-subject experiencer nominal which is coreferential with the subject of the marked clause, is not relevant to the statement of conditions on switch-reference, and is to be explained in terms of general principles of discourse coherence.

Note that this final proposal is interestingly different from the canonical definition of switch-reference because in the canonical definition, SS marking is the more restricted of the two and DS marking is something of a default case, whereas in the final definition, it is DS marking which is more restricted and SS marking is something of a default.

It is proposed that this final hypothesised definition is a universal statement of conditions on switch-reference, with individual languages possibly adding further restrictions. If we take up this position, the final definition is not incompatible with the fourth group of Imbabura Quechua examples, taken from Cole (1983) and discussed at the end of this section: Cole suggests that to account for these examples we must make reference to a person or agentivity hierarchy of the kind proposed by Silverstein (1976), and redefine the

switch-reference markers accordingly: SS is used if the subject of the marked clause outranks that of the controlling clause on the hierarchy (which by definition includes cases of actual coreference). What this means is that SS is used if the subject of the marked clause is more agentive than that of the controlling clause: this can be seen as just a more specific version of the final definition, with the language particular part coming in the definition of what counts as more or less agentive.

Further support for this hypothesis is provided by Nichols (1983: 247 etc.) who claims that the relevant definition of switch-reference pivot for the languages of the Northeast Caucasus which she discusses, is that of 'most subject-like NP', where this involves a ranking of NPs along a number of dimensions - topicality, animacy, agency, affectedness - that she says is equivalent to setting up a hierarchy of semantic roles, agent > experiencer > patient etc.

A number of questions remain. One important issue is the assumption that it is possible to identify for all the languages at issue a notion of 'surface syntactic subject', and that it is just this notion which is relevant to the determination of switch-reference marking. It has been argued within a number of theoretical paradigms over the past few decades that even excluding distinctions between 'surface/syntactic' and 'logical' subjects, 'subject' is best seen as a complex of properties which may be assigned to different NPs in the same clause, at least in some constructions in some languages (see especially typological studies of subject such as Keenan 1976, and work in Role and Reference Grammar such as Foley & Van Valin 1977, Van Valin & Foley 1980). From another perspective, work on the 'Unaccusative Hypothesis' within Relational Grammar, Lexical Functional Grammar, and Government and Binding Theory, has developed interest in whether we need to distinguish between 'morphological' and 'syntactic' subjects, based on data from languages which exhibit various kinds of 'quirky subject case marking'. It has not been possible to fully address this problem here, but the import which it has for the data which has been discussed is simple: if indeed we do need to distinguish different kinds of subjects, then it is possible that in the languages in question, switch-reference operates in terms of one type of 'subject' (morphological vs. syntactic, or role-oriented vs. reference-oriented, for example), whereas other grammatical phenomena operate in terms of another kind. However, this suggestion is open to the same objections as were made to the suggestion that switch-reference operates in terms of agent/experiencer rather than surface subject: chiefly, the examples in which there is no nominal argument which could be regarded as a subject NP of whatever kind. We might try to exclude these cases by saying that SS is simply the default, and that it occurs if there is no nominal argument in the controlling

clause. But there are other problems with attributing switch-reference marking to one particular set of subject properties: we discussed above some problems for the morphological vs. syntactic subject distinction, and with respect to the role-oriented vs. reference-oriented distinction, there is evidence to suggest that even in languages where such a distinction seems motivated, switch-reference does not seem to operate consistently in terms of one or the other (see, for example, Olson 1978).

2.3. Switch-reference in Eastern Pomo: Shifts in agentivity

Eastern Pomo is a Hokan language (spoken in California) which has been most extensively studied by McLendon (1975, 1978). Its constituent order is not altogether rigid, but tends to be SOV, and the marked clause usually, but not invariably, precedes the controlling clause, to which it is subordinated as an adverbial clause. Switch-reference marking is by suffixation on the verb. Eastern Pomo thus conforms to most of the formal criteria for canonical switch-reference.

The following examples (McLendon 1978:7f.) are not problematic on a canonical account of switch-reference. Note that coreferential arguments are deleted.²⁰

- (39) a. H́́aa ḱ́aluhu-y, siiḿ́aa mérqakiihi
 S_A:1SG went_home-SS, S_A:0 sleep
 I went home and then I went to bed.
- b. H́́aa ḱ́aluhu-qan, miiiṕ́ mérqakiihi
 S_A:1SG went_home-DS, S_A:3SG lay_down
 I went home and then he went to bed.

²⁰ The abbreviations A,P,S_A,S_P used in morphemic glosses are grammatical functions which will be fully explained below. Eastern Pomo is a 'Split Ergative' language with Split/Fluid-S marking; see Dixon (1979). Dixon defines the 'core grammatical functions' S,A,P as: the sole argument in an intransitive construction (S); that syntactic argument in a transitive construction which is the more agentive of the two in core clauses (A), and that syntactic argument in a transitive construction which is the more patient-like in core clauses (P); languages with Split/Fluid-S marking treat the sole argument of an intransitive construction morphologically like an A or like a P depending on whether its role is that of agent or patient.

- (40) Miipal k^h₁ kox-qan muu^ʔʔki-y muudála
 P:3SG A:3SG shot-DS curl_up-SS die

He₁ shot him₂ (and he₂) curled up (and he₂) died.

Like many other Hokan languages, Eastern Pomo has a rather elaborate switch-reference system. The four pairs of suffixes mark the following distinctions in meaning:

1. First, they all mark the clause suffixed as being a subordinate clause embedded in a matrix clause. There are 11 dependent-verb forming suffixes in Eastern Pomo, all of which indicate that the suffixed verb is syntactically subordinate. Of these, 8 are the switch-reference suffixes described below. These seem to be true subordinate clauses rather than medial clauses of the kind found in Papua New Guinea languages, however McLendon does talk about them in terms of the formation of dependent-verbs, and it does seem that the relationship between dependent and independent 'sentences' in Eastern Pomo is somewhat different from that between main and subordinate clauses in English.
2. They mark temporal and logical relations between the events described by the clauses. Specifically, there is a sequential/simultaneous contrast, and a crosscutting causal/unrelated contrast.
3. They mark co/disjoint reference between clause subjects, but this is a case where the correlation between SS and coreference, DS and disjoint reference, is not absolute (see 4 and below). It is also problematic to what extent it is possible to define 'subjecthood' in Eastern Pomo, but for the purposes of this paper we shall assume that it is possible.
4. They mark shift in agent/nonagent status of the protagonist, as indicated by the morphological form of the pronoun subject (described below).

The system is set out in (41) (see McLendon 1975:89). 'e₁' is the event or state described in the dependent, switch-reference marked clause, and 'e₂' is the event or state of the following controlling clause. '<' means 'before', 'O' means 'is simultaneous with', and '=>' is the relation of logical implication. Certain rather complicated asymmetries between SS and DS are ignored in the table since they are somewhat peripheral to the argument, but they will be explained in due course.

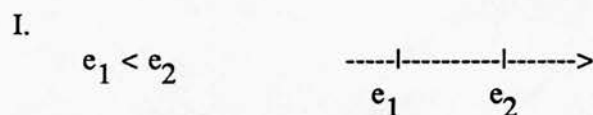
(41) The switch-reference system of Eastern Pomo.

		SS	DS
I.	$e_1 < e_2$	-iy/-y*	-qan
II.	$e_1 \text{ O } e_2$ OR e_1 justifies e_2	-in/-n*	-sa
III.	$e_1 < e_2$ AND $e_2 \Rightarrow e_1$	-p ^h i	-p ^h ila
IV.	$e_1 \text{ O } e_2$ OR e_2 begins at the same time as e_1 and continues after it.	-baya	-iday/-day*

*after a vowel

For both I and II SS marking, the subject may or may not be expressed.

We can illustrate the different temporal relations involved using a Reichenbachian model (see Reichenbach 1947). Again, using e_1 and e_2 :



That is, the event in the marked clause precedes the event in the controlling clause (translated by English 'after e_1 , then e_2 ', 'when e_1 , then e_2 ' or 'and then e_1 , and then e_2 '). For the DS marker only, if the marked clause follows the controlling clause rather than (more usually) preceding it, the marker has the additional meaning of indicating a causal relation between e_1 and e_2 .



That is, the event in the dependent clause is simultaneous with the event in the controlling clause (translated by English 'was V-ing as e_2 '). This particular suffix pair is also used to indicate a purely logical relation such that the event of the dependent clause justifies or

explains the event of the controlling clause (' e_1 that's why e_2 ', ' e_1 in order to e_2 '): whereas the SS marker can have either reading, the DS one can have only the logical reading.

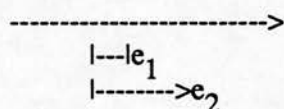
III.



That is, the event of the marked clause precedes that of the controlling clause (as in I) - but III is a more specific version of I, since there is an additional constraint on the logical relation between the two events, i.e. that the event in the marked clause is a prerequisite for the realisation of the event in the controlling clause. (Translatable in English by 'when e_1 , e_2 ' or 'if e_1 , e_2 '.)

IV.

$e_1 \text{ O } e_2$, i.e. e_1 and e_2 overlap - they are either simultaneous or e_2 begins at the time specified for e_1 and continues after it.



Note that we have no information about aspect (or types of eventuality): there may be distinctions between punctual and continuing events which might be important for IV and for II. The pair in IV are translatable in English as 'while e_1 , e_2 ', 'since e_1 , e_2 ', etc. There appears to be a difference between SS and DS, again.

Suffix pairs I and IV seem to indicate purely temporal relations, of precedence and overlap respectively, whereas II and III indicate not just temporal relations (of overlap or precedence), but as well or instead are used to indicate logical relations of justification for (reason for) or necessary prerequisite. We need to know the answer to such questions as: is the use of II in the sense of explanation restricted to cases where the subordinate clause describes a state? Is the difference between the other sense of II, and IV, just a matter of aspect (types of eventuality)?

The one clear generalisation we can make here is that the event of the marked clause, e_1 , never follows the event of the controlling clause, e_2 . This is as we would expect on the basis of the discussion in chapter 1.

For information, Jacobsen (1983:156-7) sets out the system in a rather different way (see 42). He does not mention the SS suffix *-bàya* listed in McLendon (1978), and he attempts to rationalise the system by taking seriously the fact that the SS and DS members of pair II above have quite different meanings. He claims that one should not try too hard to find a symmetrical system in Eastern Pomo, and he also has access to unpublished work by McLendon which may be the basis for the additional meaning he postulates for some of the suffixes. I have no way of checking the differences between the two systems at the moment, and they do not seem to materially affect the argument, so I will continue to follow the published system from the original grammar in McLendon (1975).

(42)	SS	DS	
	-iy	-qan	anterior and motivating
	-in		simultaneous and motivating
		-iday	simultaneous
		-sa	past or habitual condition, motivating
	-p ^h i	-p ^h ila	future anterior prerequisite

Eastern Pomo has 'recapitulation clauses' which occur at the beginning of sentences and carry switch-reference, thereby linking two sentences. These clauses may have actual verbs (often repeated from the preceding clause) as is more common in Pomo languages generally, or what are called 'utility verbs', which have the very general meanings 'to be (thus)' or 'to do (thus)' and exist mainly to carry the switch-reference marking. In Eastern Pomo the utility verbs which occur are: *?i-*, 'do, and *miin?i-*, 'be'. All suffixes may appear on these verbs.

Before looking more closely at the violation of the Functional Condition, we need some further facts about Eastern Pomo. Its pronoun system is set out in (43) (McLendon 1978:2).

(43) The pronoun system of Eastern Pomo.

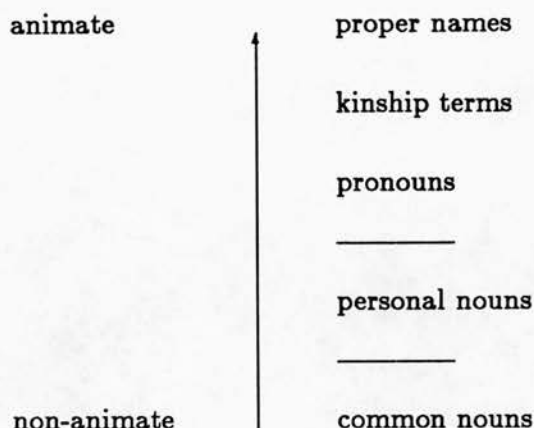
		I (A and S _A)	II (P and S _P)
1st	sg	háa	wí
	pl	wáa	wáal
2nd	sg	má	mí
	pl	máa	máal
3rd	sg m	míip'	míipal
	sg f	míit'	míiral
	pl	béek ^h	béekal
anaph 3rd	sg	héek ^h híi	
	pl		héekal

The forms in column I are agentive, and those in column II are nonagentive.

Eastern Pomo has a complicated 'Split/Fluid-S' system of ergativity (see McLendon 1978, Dixon 1979).²¹ NPs which are either classed as animate or which refer to protagonists with a high degree of control, take forms from column I. NPs which are either grammatically inanimate or refer to protagonists with a low degree of control take forms from column II. The animacy hierarchy is given in (44).

²¹ McLendon (1978) presents the evidence for ergativity in Eastern Pomo, claiming that it is syntactically ergative as well as morphologically: the lack of a passive; the presence of noun suffixes which mark the subjects of transitive verbs but not those of intransitive verbs; variation of the verb stem to show plurality in an ergative pattern. As we have seen it is at best Split Ergative.

(44) Animacy hierarchy.



In particular, this means that the NP in an intransitive construction (intransitive S), is treated either as an agent or as a patient, depending on the following factors:

(i) certain intransitive verbs (called 'patient-taking intransitives') always take the II form. Examples are *ʔečki* 'sneeze', *baakuu*, 'fall'. The nature of the action is such that there is no real possibility of protagonist control.

(ii) certain intransitive verbs take either agent or patient form (I or II) according to the degree of protagonist control in the situation being described on a particular occasion. These are called 'Split-S intransitives'. Examples are *ʕeexel*, 'slip/slide', i.e. 'slip accidentally/slip deliberately', *diikó*, 'hit'. The examples in (45) and (46) are from McLendon (1978:3).

- (45) a. **Wí** *ʕeexélka*
S_P:1SG slip/slide

I'm slipping.

- b. **Háa** *ʕeexélka*
S_A:1SG slip/slide

I'm sliding.

- (46) a. **Wí** *baatéčki*
S_P:1SG get_bumped

I got bumped (accidentally).

- b. Haa baatécki
 S_A:1SG get_bumped

I got bumped (on purpose).

(iii) certain intransitive verbs (also called 'Split-S intransitives') take either agent or patient, I or II form, depending on where the NP falls on the animacy hierarchy: animates take I and inanimates take II. These verbs include the verb 'to sit' and other verbs of location and directed action.

Transitive verbs normally take at least one patient NP (the 'object'). However, transitive verbs also may take either agent or patient (I or II) forms for the other NP (the 'subject'). Transitive verbs are classified as either agent-taking or patient-taking. Examples of agent-taking transitives are *šaak*, 'kill', *qaanee*, 'bite'. Examples of patient taking transitives are verbs of emotional state like *maaraa*, 'love', *maʔas*, 'hate'. While column I forms are used unmarked for agentive NPs occurring with intransitive verbs, for agentive transitive verbs they are additionally marked by the subject marker *heʔ(ə)*-.

To complete the picture, note that verbs which naturally occur with patients and not agents can take agents if they have a causative or reflexive suffix.

It would seem that numerous lexemes in Eastern Pomo have a feature for agentivity/animacy/control (verbs require an agentivity feature; nouns are talked about in terms of animacy, but there seems to be no reason why the verbal and nominal features should not be the same, especially as they have the same effect grammatically). This feature tells something about the type of event being described, and contributes to the meaning of both the nominal and verbal elements in the clause. An approach of the kind which will be described in chapter 5, using unification, is able to capture very nicely both the implicit requirement that nominal and verbal elements should be compatible in agentivity, and the percolation of agentivity features from nominal to verbal element and vice versa. So Eastern Pomo has a kind of agreement between nominal and verbal elements, in agentivity value rather than is the more usual number, gender etc.

Now consider the examples in (47) (McLendon 1978:8).

- (47) a. Haa xaaqaki-qan, wi ʔaalálmaya
 S_A:1SG took_a_bath-DS, S_P:1SG got_sick

Just because I took a bath, I got sick.

- b. Wi ʔaalálma-qan, haa k^húyhi qóyuhùu
 S_P:1SG got_sick-DS, S_A:1SG didn't come

Here, the NPs in the marked and controlling intransitive clauses are coreferential, yet the DS marker is used. The clue to why this is so lies in the forms of the pronouns: in both examples, one NP is agentive and the other is a patient. The DS marker is used to indicate that there has been a switch in the agentivity of the 'subject' NP. Example (48) (from McLendon 1975: 179) is similar.

- (48) Báa qaak^hóx-qan, xa
 S_P:that_one(ANAPH) catch_with_hook_&_line-DS, HEARSAY_EVID
 šahe?miip dáhe?miiral 'íéteele...
 A:fish_MASCSUBJ P:woman_FEMOBJ tell

After the fish was caught, the fish told the lady....

Analysis of the other examples given by McLendon confirms that SS and DS are used only under the following conditions. SS is used only when the NPs in the switch-reference relation are coreferential and share agentivity values (i.e. are both agentive or both nonagentive). DS is used in all other cases: where there is a switch in agentivity, or where agentivity is the same but there is disjoint reference, or where there is a switch in both. The table below lists the patterns of pairs of clauses which actually occur in the data, excluding cases where DS is used to mark disjoint reference but agentivity is the same.

- | | | |
|------|---------------------------------|---------------------------------|
| (49) | SS | DS |
| | A + S _A | S _P + A |
| | S _A + A | S _A + S _P |
| | S _A + S _A | S _P + S _A |
| | S _P + S _P | |

The fact that DS is used whenever there is a difference between the NPs, either in reference or in agentivity or both, means that one cannot reliably predict from the occurrence of DS that there is disjoint reference; one can only predict this from the conjunction of occurrence of DS plus information to the effect that the agentivity is the same, and this information is not available until the next clause is processed.

Finer's (1985a, b) account works for the SS morpheme, and for the DS morpheme when there is in fact disjoint reference, but it gives the wrong predictions for DS when the NPs

are coreferential.

It is important to point out that the Eastern Pomo system does *not* seem to involve the use of switch-reference markers to indicate a switch in the identity of the *agent* per se. That is, although it is a Split-Ergative system, in Eastern Pomo, as in other Ergative languages with switch-reference systems, switch-reference operates on the basis of a Nominative-Accusative definition of subject (as S and A functions). The switch-reference system has been functionally extended so that it indicates not just identity of subject, but also whether the agentivity value of the subject is the same or different. It would be easy to assume that something rather different is going on (as Foley & Van Valin 1984: 119-129, 345 appear to, although it is not entirely clear what they mean here) because in cases where the DS marker is used but there is coreference, the marking on the subjects involves one marked like an A (a transitive subject) and one marked like a P (a transitive object).

Oswalt (1983: 288 etc.) indicates that there are also interactions with agentivity in Kashaya, another Hokan language fairly closely related to Eastern Pomo. It is not clear from what he says there whether the Kashaya system works in the same way or not. He notes that in Kashaya, some verbs are 'personal' in that they can take a person or sentient being as their agent and overt subject, while others are 'impersonal' in that they do not normally take a person as agent and rarely have an overt subject. Some verbs can be either, with personal use implying control of the event by the subject and impersonal use implying lack of control. It sounds from this as if the distinction between the two kinds of verbs, or usages, corresponds to that between verbs with A or S_A subjects and verbs with P or S_P subjects in Eastern Pomo. Oswalt further notes that although impersonal verbs (P or S_P verbs?) do not normally have a subject: 'there is an agent in the sense that there is something which is designated by the agential [switch-reference, L.S.] suffixes as the same as, or different from, the agent of another impersonal verb' (p.288). In illustration, he gives the following example.

- (52) Muliowam mul maadal sulam?-ba, mul c^hoyi?-Ø.
 PersExp. that her sicken-SS, that die-Abs.
- Muliowam c^hoyi?-li, mul ?ul maadal do?qo?di-Ø...
 PersExp. die-DS, that then her prepare-Abs.

It was then, when she had fallen sick, that she died.

It was then, when she had died, that they (unexpressed) prepared her [for burial] ...

Oswalt says that in this example, whatever it was that caused the woman to fall sick (eg. retribution for breaking a taboo, or guardian spirit of a taboo site) also caused her to die, and that this is why the SS marker is used. However, the DS suffix in the second sentence shows that whatever caused her death did not prepare her for burial; indeed it could not, since *do?qo?di?* is a personal verb here, with an animate agent implied.

The examples given by Oswalt are also compatible with a description of the kind proposed above for Eastern Pomo, and further work needs to be done to determine the degree of similarity between the two systems. There is clearly an interesting relationship between the Hokan systems and those described in 2.2, as well, which is highlighted by Oswalt's distinction between personal and impersonal verbs, and by the use of the notion of 'Unaccusativity' to account for Split/Fluid-S marking phenomena (eg. see Grimshaw 1987).²²

2.4. Switch-reference in Lenakel: Shifts in temporal interval

Lenakel is an Austronesian language spoken in Vanuatu (Lynch 1983). As mentioned in chapter 1, it has SVO constituent order, and switch-reference is marked by prefixation on the verb of the dependent clause, which follows the controlling clause. Marked and controlling clauses are in a coordinate, or (modified) clause-chaining relation. The SR system is asymmetrical in that there is 'zero marking' of the DS option: DS clauses look just like independent clauses, and two coordinated DS clauses look like two coordinated independent clauses.

Lenakel violates the Functional Condition in a number of ways due to interactions between

²² Oswalt even notes (p.289) the relationship between verbal prefixes concerning body parts, natural forces, etc. with the 'personality' of the verb.

referential marking and other factors.

The most relevant of these interactions here is with tense. Tense is normally overtly marked on all verbs, although it may be deleted under certain circumstances. If two clauses are conjoined by simple parataxis but one is future tense and one not, then only DS is possible, regardless of whether the subjects are coreferential or have disjoint reference. See examples (53)-(54) (Lynch 1983:213).

- (53) Magau t-r-va (kani) m-augin
 Magau FUT-3SG-come (and) SS-eat

Magau will come and eat.

- (54) a. *Magau r-n-va (kani) m-augin
 Magau 3SG-PERF-come (and) FUT-SS-eat
- b. Magau r-n-va (kani) t-r-augin
 Magau 3SG-PERF-come (and) FUT-3SG-eat (zero DS)

Magau has come and will eat (later).

In example (53) both clauses are future tense, with the future tense suffix *t-* obligatorily deleted from the second, marked verb. The clauses also share the same subject referent. In this case SS may be used. However, in (54a), although the clauses have coreferential subjects, SS marking may not be used because the controlling clause is past tense and the marked clause is future tense. Instead, DS marking must be used, as in (54b).

DS thus functions to indicate that there has been a change either in chief protagonist or in the temporal interval within which the events described occurred. The future tense has a special status in the language anyway, and given its common connection, crosslinguistically, with irrealis mood, it would not be too surprising to find that DS effectively marks a change of mood through marking the temporal shift. This is for further research to determine.

So in Lenakel as in Eastern Pomo, strictly speaking, DS is ambiguous, and fails to signal unequivocally whether the subjects of the two clauses are coreferential or not - although in practice disjoint reference will normally be indicated by presence of an overt subject NP in the marked, dependent clause, as in example (55).

- (55) Magau r-n-va kani lomhan t-r-augin
 Magau 3SG-PERF-come and Lomhan FUT-3SG-eat (zero DS)

Magau has come and Lohman will eat.

There are other languages in which functional extensions of the switch-reference system are intrinsically connected to temporal and/or modal meaning. One of these is again Amele, which will be described in the next section. In chapter 1 we also saw that this kind of aberration occurred in Tunebo and Guanano, languages in which the indication of whether two eventualities occurred sequentially or simultaneously is more basic than an associated SS/DS distinction, to the extent that the sequential marker, normally used for SS, may be used even though there is disjoint reference as long as the events are sequential, and the simultaneous marker, normally used for DS, may also be used when there is coreference as long as the events are simultaneous - again provided also that there is explicit marking by a noun or pronoun.

Just to round off the discussion of Lenakel, I will briefly indicate the other areas in which the SR system violates the Functional Condition.

First, there is an interaction with the syntactic relation between the clauses which is indicated by the presence of switch-reference marking. DS may mean that there is coreference but a different relation between the clauses - that they are coordinate rather than subordinate (here again in practice disjoint reference is shown by presence of an overt subject). The reason this kind of thing happens is that in Lenakel, while SS clauses are dependent ones, DS clauses are automatically given the status of independent clauses. SS marking may only occur on a verb which is coordinate with the preceding verb; it may also occur on the second of two clauses, both of which are subordinate to some other clause. When the verb is not coordinate with the previous verb (either when it is subordinate to it or superordinate to it), then DS marking must be used. Examples are given in (56)-(58). In (56), the marked verb is subordinate to the controlling verb, so SS may not be used despite the fact that the clauses have coreferential subjects. In (57), the controlling verb is subordinate to the marked verb, and again SS marking is disallowed. Once again, these sentences would normally receive a coreferential interpretation, because in a case where the subjects were disjoint an overt subject NP would normally be used, as in (58).

- (56) a. *Magau r-im-augin le nian m-va
 Magau 3SG-PAST-eat LOC time SS-come
- b. Magau r-im-augin le nian r-va
 Magau 3SG-PAST-eat LOC time 3SG-come

Magau ate when he came.

- (57) a. *Kapamwa r-va,
 if:PAST 3SG-come,
- b. Kapamwa r-va,
 if:PAST 3SG-come,

If he had come, he would have eaten.

- (58) Magau r-im-augin le nian tion r-va
 Magau 3SG-PAST-eat LOC time John 3SG-come

Magau ate when John came.

Second, SS marking can sometimes be used when the subject of the verb is coreferential with some other argument of the controlling clause. This happens if the two are coreferential *and* the NP in question is different in number from the subject NP (so there is no possibility of ambiguity). Examples are given in (59)-(60). SS may also be used to indicate coreference between the subject of the marked clause and a non-subject argument of the controlling clause, if it is impossible on semantic grounds for the subject of the controlling clause to be the subject of the marked clause. See examples (61)-(62). These examples may be amenable to reinterpretation in terms of the discussion of impersonals and inanimate subjects given in 2.2. It is not clear whether this is an obligatory or an optional use of SS marking.

- (59) Magau r-im-ho tom mine siak kani m-u-akimw
 Magau 3SG-PAST-hit Tom and Siak and SS-DU-run:away

Magau hit Tom and Siak and they ran away.

- (60) Peravin miin k-im-ar-ofin nauginaan kam
 woman PL 3NSG-PAST-PL-give food DAT
 in kani m-ep-apul
 him and SS-SEQ-sleep

The women gave him food and then he slept.

- (61) I-im-alak-hiaav-in kesi m-pwalhepwalhe
 1EXC-PAST-throw-down-TRANS pawpaw SS-splatter

I dropped a pawpaw and it splattered.

- (62) I-im-os nelki kuri m-im-arpiko
 1EXC-PAST-hold leg dog SS-PAST-thrash:about

I held the dog by the leg and it thrashed about.

2.5. Switch-reference in Amele: Shifts in time, place and world

In Amele, a DS marker may be used even where there is coreference, if there is a change in time or place from one clause to the next, or a modal switch between an intended or proposed action and a real action. Native speakers apparently explain such cases by saying that the DS suffix marks the beginning of 'a new situation' ('something has changed') (Roberts 1987:303ff.). These cases will be discussed in detail in chapter 5. Representative examples of a change in location, temporal interval, and modality are given in (63), (64), and (65) respectively. Aberrantly marked verbs are in bold.

- (63) Age ceta **gul-do-co-bil** l-i bahim na tac-ein.
 3p yam **carry-3s-DS-3p** go-PRED floor on fill-3p-RemP

They carried the yams on their shoulders and went and filled up the yam store.

- (64) Eu 1977 jagel November na
 that 1977 month November in

odo-co-b cul-ig-en.
do-DS-3s leave-1p-3s-RemP

That was in November 1977 that he did that and then he left it for us.

- (65) 'Hina gaim heew-ig-a eu mani-te-te-m
 2s crab hold-1s-TodP that roast-SIM-1s-2s-DS
- ija sab met-ig-en,' do-n. Odo-co-b
 1s food peel-1s-Fut 3s-3s-RemP do-DS-3s
- sab met-en ijom.
 food peel-3s-RemP EM

'You roast the crab that I caught for me while I peel the food,' she told him. Then, alright, she really peeled the food.

These aberrant uses of DS marking are normally backed up by the presence of temporal or locative adverbial expressions, verbs of motion, or aspectual verbs of termination and inception, and in the case where a modal shift is indicated, it is usually quite clear that the contrast is between an intended action and the real action. Further discussion of linguistic elements of the sentences which license aberrant DS marking is given in chapter 5.

Roberts (1987, and more especially 1988) considers that this use of the switch-reference system in Amele should be accounted for not in the syntax (as Finer attempts to do) but in the pragmatics. As I said in chapter 1, I think the systematic nature of switch-reference marking, even in Amele, requires at least an initial attempt to handle it in the morpho-syntax/semantics, although I also believe both that a Discourse Representation Theory account has more potential than an account such as Finer's, and that there will be influence from context in determining which of the range of potential meanings switch-reference in Amele has is intended on a particular occasion. See the account in chapter 5.

The final example of violation of the Functional Condition also comes from Amele, where it is common in narrative to begin a sentence with a 'recapitulation clause'; either a full repeat of the final clause of the previous sentence, or a dummy verb ('to do', 'to finish'). The dummy verb can occur in a stereotyped form with third person singular subject and object agreement marking ('He did it'), and when this happens, it functions to indicate that a particular series of related events (or 'episode') is completed, and a new one is about to begin. In such cases the dummy verb is marked with DS, even if the following clause has the same subject as the previous one to which the recapitulation clause is supposed to correspond. An example is given in (66); see Roberts (1987: 250ff.).

- (66) Eu nu qila i ege meen qaig eu
that for now this 1p stone shoot that
- mede qo-qo-na. He-do-co-b eu fal-doc
nose-3s-POSS hit-1p-Pres finish-3s-DS-3s that fence-INF
- nu cabi sanan me-q-an.
for work start put-1p-Fut

So now we are gathering that money. When we have finished that we will start to do the fencing work. [305, (629)]

According to Woodbury (1983), there is a related phenomenon in Central Yup'ik Eskimo and other languages he studied, where there is some pressure towards ensuring continued SS marking throughout a clause sequence which he refers to as a 'rhetorical unit' (defined in terms of prosodic factors, external sandhi, sentence adverbial choice and placement, etc.) - although a switch of rhetorical unit is not necessarily marked by DS. Munro (1983:228-9) also notes that speakers of Mojave will use function changing (subject creating) thematic processes to effect continued SS marking with a unified topic throughout a sequence of clauses.

2.6. Conclusion

In addition to the unexpected uses of switch-reference markers which have been discussed or mentioned in this chapter, Jacobsen (1983:152) notes reports of unexpected uses of SS marking for Yavapai by Kendall (1975) and for Kiowa by Watkins (1976), and of unexpected uses of DS marking for Yuma by Slater (1977), and for Choctaw by Davies (1981). Jacobsen (1983:163) himself points to a possible aberrant use of DS marking in Tonkawa.

It is notable that in all the cases discussed, what happens is that, an SS marked chain having been established, it is possible for DS markers to develop additional functions, indicating whether or not some other aspect of the eventuality has changed. Unsurprisingly, the reverse does not happen, that is, the switch-reference system continues to signal disjoint (agentive) subjects using the DS marker, even in circumstances when it is redundant to do so, such as when person differences or the presence of overt NPs make it absolutely clear that the pivot NPs are different. Although unexpected SS marking does

occur, this is accounted for once we revise our definition of the switch-reference pivot and of the nature of the reference relation between pivots, to take account of agentivity.

3.1. Introduction

Chapters 1 and 2 have given a comprehensive picture of switch-reference phenomena and some discussion of the relationship between switch-reference and comparable phenomena such as logophoricity. It should be clear from what has been said so far that the question 'how can one be sure when one is dealing with a switch-reference system?' (Munro 1980b:2) has been an important one for workers in this area. Researchers have had a fairly concrete notion of what a 'canonical', 'classical' or 'true' switch-reference system looks like, and have been concerned to produce a ruling on languages which fail to conform to this profile in certain respects, such as Yup'ik Eskimo, the languages of the Northeast Caucasus, Warlpiri, or Gokana. Thus, Munro (1980b:2) notes that 'most of the participants [at the conference, L.S.] felt that the Eskimo "fourth person" system was not a canonical switch-reference system'. Such decisions are not unrelated to the other classificatory task which researchers have undertaken; that of trying to situate (canonical) switch-reference with respect to other linguistic phenomena, such as for example logophoricity or syntactic binding phenomena.

Why have these been such persistent preoccupations? After all, it would seem very reasonable to take the position that the way some function is realised formally in a language will be due to numerous factors which may themselves be amenable to systematic description, such as the morpho-syntactic typology of the language, its historical development, and functional or semantic universals (for example, the animacy hierarchy, or links between nominal and temporal cohesive devices). For any particular language, some system may be identifiable which has as one of its main functions the tracking of same or different reference of major protagonists across clauses: any such system should presumably have a fairly precisely definable place in the field of universally possible formal/functional relations in this domain.¹

It seems to me that the persistence of classificatory and terminological questions in the literature has been due to two factors. The first is the idea that switch-reference is,

¹ More graphically, one could define a space of features and then locate various systems by coordinates in this space. 'Canonical' switch-reference and 'canonical' logophoricity presumably cluster around particular (perhaps extreme) points in this space, and languages such as Gokana and Yup'ik Eskimo may fall somewhere outside these clusters.

somehow, rare, exotic or even aberrant (i.e. in 'violating' categorial iconicity). That is, it is felt to be different from other means of tracking the reference of major protagonists across clauses. There is some feeling that individuation of switch-reference on the basis of structural criteria may capture this intuition, whereas if the functional similarities between switch-reference and other devices are taken too seriously, we may lose the 'typological value of the category'; thus Heath (1983:144) notes: 'In a broad definition we might even say that Nunggubuyu does have switch-reference, though we would then perhaps be forced to say that it occurs in all languages so that the typological value of the category would be gone.' The formal characteristics which have been emphasised have been not only marking on the verb, but also the pervasive nature of switch-reference marking, as not just restricted to a few constructions, and not operating just when required for disambiguation. See the consensus view of 'true' switch-reference reported by Munro (1980b:2) on the basis of discussion of participants at the conference whose proceedings she is introducing. This more or less rules out a characterisation of switch-reference as a purely pragmatic device and as we shall see removes the possibility of seeing phenomena in other languages such as English or Spanish as types of switch-reference.

The second factor is the theoretical desideratum of identifying a universal grammar which will in the most economical and accurate way reflect the range of variation of human languages. If there is a definable phenomenon called 'switch-reference', it should be amenable to the same kind of account wherever it appears; if it is a type of reference tracking, this should be expressible in terms of parameters of variation; and any variation within switch-reference systems themselves should also be explainable in terms of parameter setting.

I indicated in chapter 1 that I do not think switch-reference is 'weird' or aberrant because it is marked on the verb; on the contrary, this seems to be a natural consequence of other typological characteristics of the languages which exhibit it. Nor does it make much sense to call it 'exotic' except from the point of view of one's own native tongue, if this happens to be a dependent-marking language such as English rather than a head-marking language such as Amele. However, I do think that the fact that switch-reference is marked on the verb is important just in that it allows the development of a multi-functional system which combines reference-tracking with other elements.

We saw in chapters 1 and 2 that switch-reference systems exhibit considerable functional complexity, both in the association of nominal reference tracking with the marking of temporal and logical relations between eventualities, and in the kinds of functional

extensions of DS marking which occur, which involve temporal, modal and aspectual meaning, as well as notions of agentivity or control of the action.

The account which I propose assumes that the detailed description of switch-reference phenomena given in the previous two chapters is accurate and crosslinguistically representative, and also makes a number of other basic assumptions. The first is that the two types of phenomena described in chapter 2 - the implication of agentivity in the definition of the switch-reference pivot, and the functional extensions of DS marking - are systematic enough and pervasive enough that any comprehensive and coherent theory of switch-reference should at least provide the basis of an account for them. We must take seriously the full range of functions switch-reference systems have, and the way they can be seen as fitting into other paradigms besides that of reference tracking. The second assumption is that it is not sufficient to assume that the 'canonical' function of switch-reference systems will be handled in the morpho-syntax/semantics while the extended functions will be handled pragmatically: given that there are a range of possible specific interpretations of DS marking in the languages in question, discourse or pragmatic factors may well be involved in the resolution of interpretation on any particular occasion, but as we shall see in chapter 5, the functional extensions are grammaticised enough and form a coherent enough set semantically, that it is possible to give a more interesting and unified account of the semantics of switch-reference systems. The final assumption is that it is desirable to aim for a syntax/semantics which is compositional and conforms to a 'rule-to-rule hypothesis' whereby every syntactic rule is associated with a semantic rule.

In this chapter I shall briefly describe two previous informal theoretical conceptions of switch-reference, that developed by Givón (1983) and that developed by Haiman (1983). These place different degrees of emphasis on the structural and functional similarities between switch-reference and other phenomena and also reflect ideas about its origins. I shall then propose a third way of thinking about switch-reference theoretically which is not incompatible with these two approaches, but which provides a better basis for accounting for the full range of functions of switch-reference systems, and therefore will underlie the formal accounts presented in chapters 5 and 6.

Basically, I propose that we see switch-reference marking as a kind of clause-level agreement, which normally marks the clause it occurs in as syntactically and semantically dependent, and indicates whether there is continuity or discontinuity between the eventuality described by the marked clause and that described by the controlling clause. Eventualities may agree or disagree along various parameters, including not only their

major protagonists, but also their temporal and spatial location, their actuality and their place in a larger complex of eventualities which may be presented within a discourse. The fact that pivot NP co/disjoint reference is in some sense primary then becomes something of interest and remains to be explained.

3.2. Switch-reference as topic maintenance

As Haiman (1983:105) points out, 'since the discovery of switch-reference systems, attention has been focussed primarily on their structural properties.' Although he assumes that this is reasonable, others believe that this bias has been detrimental and that more attention should be paid to functional properties. Givón (1983), who puts the case most strongly, argues that researchers have tended to ignore the fact that switch-reference can be situated in a wider functional context.

It is worth expanding on Givón's (1983) position in some detail, first because he makes the fullest statement of the argument that switch-reference should be described as just a variant of reference disambiguation, and second because he mentions in passing certain ideas which support the proposal I shall put forward in 3.4, 3.5 and 3.6.

Givón believes that there are certain functions which languages can fulfil, and that the formal phenomenon characterised as 'switch-reference' (with the formal characteristics described in chapter 1) is just one way of fulfilling a particular function: namely, what he calls 'topic continuity'. 'Topic continuity' is more complex than and subsumes referential tracking.

Givón sees the clause as the basic information-processing unit in conversation, and sees clauses as combining to form 'thematic paragraphs', which may themselves combine into larger coherence units, such as 'chapters' or 'stories' (i.e. types of units at the level of discourse). That is, he works with a concept of clause sequence which is independent of sentence boundaries, and which (it seems) is defined in an intentional and functional rather than a structural way; though he does make some reference to structural criteria such as intonation and syntactic clause boundaries.

In this scheme, there are three main levels of continuity in discourse:

- I. Thematic continuity
- II. Action continuity

III. Topic (or participant) continuity

The first pertains to the structure of the discourse above the level of the thematic paragraph, and seems to involve considerations of genre, style, or even content. In the paper at issue he says nothing further about it.

The other two levels of continuity are involved in defining the structure of the thematic paragraph and the syntax of clauses. Clauses are made up of one or more participants (or topics), plus the verb (or predication).

Action continuity is the domain of chaining verbs or predications one after another within the thematic paragraph in 'a way that *coheres* or makes *temporal or causal sense*' (p.54). The grammatical subsystem principally concerned with this is the tense-aspect-modality system, most commonly found as verbal bound morphology. It is this subsystem which marks clauses as 'foreground' or 'background', i.e. as inside or outside the sequence of action continuity; as clauses which maintain the sequence of action continuity and move the action along, or which do not. Givón says that 'while action continuity is often inseparable in live discourse from participant/topic continuity, I will have little to say about it here' (p.54). He adds in a footnote that occasionally, the same syntactic device is used to code either action break or topic change - this is one manifestation of more general links between nominal based and predicate based 'meaning', and we shall return to it below.

According to Givón, thematic paragraphs in discourse are generally organised so that one 'nominal' tends to be the recurring 'topic' of the paragraph: that is, it tends to appear in each successive foreground clause in the paragraph. This is what is meant by **topic continuity**: the maintenance of one topic via its occurrence as a nominal in each of the clauses which maintain action continuity.²

Givón also recognises a continuum of 'continuity values'. At different points in a thematic paragraph a topic will have different continuity values. For example, at the beginning, supposing it is a new topic, it breaks the continuity of the preceding paragraph's topic chain, whereas later manifestations maintain the continuity of the current chain. Topic continuity is the unmarked case and, Givón says, easier to process (this fits the fact that SS appears to be the unmarked case in switch-reference systems, but leaves us with something

² 'Topic' is a nonatomic discourse-functional entity, whereas 'subject' is defined as an again nonatomic 'grammaticalised/systemised topic'. Languages differ in the extent to which the function of topic is grammaticalised (see Li & Thompson 1976).

to be explained in that in logophoric systems it is noncoreference which is unmarked). There are degrees of discontinuity depending on distance, number of potential topics, and other factors pertaining to the potential difficulty of topic identification.

Differences in the syntactic coding of the topic NPs are dependent on such considerations as the continuity value of the topic. Givón sees intonational and word order constraints as just as important and highly pertinent to this functional domain as morphological contrasts.

He identifies a number of pairs of contrasting formal features which act as devices to indicate topic continuity vs. discontinuity, at various continuity levels - such as an opposition between stressed and unstressed pronouns. As well as different devices being used at different levels of continuity, different languages also make different choices from the devices available. It is these devices which he compares to switch-reference.

For example, one such device used in English is an opposition between the use of contrastive stress on a pronoun and the unmarked case of the use of non-contrastive stress. Compare the following pair of sentences, where contrastive stress is indicated by bold type (see also Givón 1983:58).

- (1) He went North and **he** went South.
- (2) He went North and he went South.

Here, contrastive stress is used to indicate topic discontinuity, or disjoint reference between subjects (a switch in the subject of the clause), while the unmarked case is topic continuity, or same subject of the clause. Givón claims that universally, lower intonation or stress signals predictability and continuity, while higher prosodic value signals discontinuity, surprise or new information. See also Brown & Yule (1983), Prince (1981) etc. on these matters.

A further contrast, again from English, is exhibited in the following pair of sentences (from Givón 1983:66):

- (3) Before he left, John talked to Bill.
- (4) Before leaving, John talked to Bill.

In (4), where there is deletion of the subject, continuity of reference of the subject NPs is assumed. In (3), the first clause has an overtly coded subject, and this may be read as

coreferential with either NP in the following clause.

Two other devices which Givón identifies include:

- (i) The opposition of grammatical agreement (or 'bound pronouns') and independent pronouns in pro-drop languages such as Spanish.
- (ii) Word order differences eg. in Biblical Hebrew, where the SV word order is used to encode disjoint subject reference, and VS order to encode same subject reference.

In fact, Givón sees bound pronouns as comparable with unstressed ones, and independent pronouns as comparable with stressed ones. A further possibility is simple zero anaphora, and languages differ in which pairs of devices are opposed: English opposes stressed and unstressed pronouns; Spanish opposes agreement and free pronouns; Japanese opposes zero anaphora and free pronouns.

The use of word order as a continuity device is interesting from the point of view of the argument to be developed in this chapter. In Early Biblical Hebrew the word order distinction described above correlated very closely with the use of aspect. Perfect aspect was used with SV word order to code out of sequence or anterior clauses, and imperfective aspect was used with VS word order to code sequential clauses. Thus, as Givón notes, there was almost complete agreement between the two major indices of continuity in discourse: of action, coded by the aspects, and of the topic NPs, coded by the word order. Notice how his interpretation of the data is constrained by his requirement that the language conform to the principle of categorial iconicity. In Ute, too, SV/VS order are distinguished, with SV coding reintroduced definite NPs after a long absence and newly introduced indefinite subjects (the most discontinuous topic NPs); while VS order codes other NPs. This applies not just to subject but also to object NPs. It is interesting to speculate as to why SV or OV codes discontinuous topics, while VS or VO codes continuous ones.

In summary, the choice of devices available is taken to include the following major options.³

(a) AGREEMENT vs. FREE PRONOUNS

³ This does not exhaust the full range of devices discussed by Givón (1983).

(b) UNSTRESSED vs. STRESSED PRONOUNS

(c) FINITE CLAUSES vs. NONFINITE GERUNDIVE NOMINALISATIONS

(d) WORD ORDER DIFFERENCES

Those of the strategies for reference which refer to the form of NPs are arranged in a hierarchy tied to the degrees of continuity to be expressed.⁴

ZERO ANAPHORA > UNSTRESSED PRONOUNS/AGREEMENT MARKERS >

STRESSED PRONOUNS/FREE PRONOUNS > FULLY LEXICAL DEFINITE NPs.

The strategy is that one starts as low as possible in the hierarchy (i.e. as far to the left as possible) and that sticking to the same level indicates continuity whereas moving up a level indicates a discontinuity; the general principle being that the more predictable the information, the less coding it receives. For example, zero anaphora in English indicates coreference; a shift in the subject/topic will normally precipitate a move to the next level up, i.e., use of a personal pronoun (although the reverse does not always hold, i.e. use of a pronoun may not always indicate disjoint reference).

In this context, Givón makes two claims about switch-reference. First, that it is functionally just like these devices, even though, unlike them, it violates categorial iconicity (a point which he does not really discuss). Second, that historically, we are led to hypothesise that switch-reference systems developed from one or other of these processes.⁵

In fact, Givón discusses a number of hypotheses about the development of canonical switch-reference from a range of such coding devices, in some cases giving examples from languages where such a development seems to have taken place or currently to be taking place. He then tries to judge which process is the most likely precursor of switch-reference devices - although he does acknowledge that the origins of switch-reference might be heterogeneous, this is apparently not a preferred option. The hypotheses considered are:

- (i) Switch-reference developed from a contrast between zero anaphora, agreement or unstressed pronouns (SS) and free or stressed pronouns (DS). (This seems to

⁴ It is not clear where the other devices such as word order contrasts fit on this hierarchy.

⁵ Note that the assumption here is that switch-reference is inherently a less 'natural' way to mark topic continuity than these other processes, in which case one wonders what caused it to develop from them.

have happened in Lango, an East African language.)

(ii) Switch-reference developed from a contrast between participial or nominalised clauses (SS) and finite clauses or other subject marked clauses (DS). (He gives examples from Latin, Classical Greek and Amharic.)

(iii) Switch-reference developed from word order contrasts as in Hebrew.

(iv) Switch-reference developed from deictic-related morphemes (contrasting 'proximate' SS and 'remote' DS) (Persian provides a possible example.)

(v) Switch-reference developed from a pronoun-deictic contrast between first person (SS) and non-first person (DS) agreement (as in Sherpa).

There is no space to discuss these fully here. Givón rules out (iii) and thinks (iv) unlikely. (v) represents the possibility that switch-reference systems may develop from logophoric ones, since the Sherpa data appears to indicate a logophoric system in that it is restricted to the reporting of direct or indirect speech, and is restricted in person. Givón believes a pronominal or deictic origin (i or v) is most likely for non-anticipatory switch-reference, and claims that one could build up a reasonable argument to support the same origin for anticipatory switch-reference (cf. p77) as a contrast of subject pronouns on following clauses which got cliticised to the preceding clauses.⁶

I think we must see Finer's claim that switch-reference should be handled as a binding phenomenon as falling into the category of switch-reference as defined by its function, as an instance of the referential tracking approach. Focussing on the Function Condition led Finer to see switch-reference as a type of syntactic binding on a par with other sentence-bound anaphoric phenomena which are accounted for by the binding theory, such as reflexives (his example). Finer's is clearly a very different approach to Givón's, however, because it requires that we take a sentence grammar perspective of switch-reference, whereas Givón's is a discourse approach.

Somewhat similar ideas to those discussed in this section inform Woodbury's (1983) description of switch-reference in Yup'ik Eskimo. His conception of switch-reference is similar to that of Givón in that he too sees switch-reference as a referential tracking device, and also considers the way it fits into a theory of discourse cohesion more generally.

⁶ Givón (1983:77) defines 'canonical switch-reference' as being of two kinds, anticipatory or non-anticipatory, depending on whether or not the marked clause precedes or is superordinate to the controlling clause.

Woodbury considers switch-reference in Central Yup'ik Eskimo from the perspective of a concept of **rhetorical structure**, and generalises this to other languages. The rules which have normally been given for switch-reference devices in Eskimo have always been known to be inadequate in that there is a group of counterexamples, arising in actual texts but not elicited material, which they do not account for. Woodbury claims that these counterexamples lead to a set of conclusions about discourse organisation.

For Woodbury, the **rhetorical structure** of a discourse is signalled by **rhetorical units** signalled by grammatical devices including intonation and adverbials.

Eskimo languages have two devices which indicate switch-reference, both formally part of the inflectional system. The first is the appositional mood, used to mark a clause in apposition to another clause with which it (usually) shares a (transitive or intransitive) subject - a bit like English 'while V-ing, NP V-ed'. Chains of appositionally marked clauses represent a loose stringing along of propositions and an implication of simultaneous or sequential time relation between them. The appositional mood (which is in a class of its own), generally marks clauses that either are appositive or subordinate to other clauses, and whose subjects are usually coreferential with the subjects of those clauses. Note that in addition to marking mood, every verb ending cross-references the person and number of the verb's core arguments. Unlike the other switch-reference device in these languages, to be discussed below, this is a restrictive switch-reference mechanism, and can only be used if the subject of the marked clause and the subject of the controlling clause are coreferential. If the subjects are not coreferential, an entirely different construction must be used, because there is no construction with all the syntactic and semantic effects of apposition but which indicates disjoint subject reference.

The second device which he describes as a switch-reference system is the reflexive vs. plain third person distinction (sometimes called fourth vs. third person) - which indicates that a NP is coreferential or noncoreferential with the (transitive or intransitive) subject of a controlling clause in a specific structural relationship to it. As we have seen, this contrast is restricted to the third person, and may involve non-subject NPs. I suggested that it could be regarded as an obviative or perhaps a logophoric system instead of a switch-reference system, depending on how these phenomena are considered to relate to one another. When a third person nominal NP of a dependent clause is coreferential with the subject of a controlling clause, it is treated as fourth person, and marked as such by means of a fourth person cross-referencing in the ending of the verb of its own clause. Otherwise, a third person subject NP is treated as plain third person.

The counterexamples to be explained are ones in which the appositional mood is used even though the subjects of the related clauses are not coreferential. Woodbury claims that this results from an understandable pressure to use the appositional construction even when its coreference conditions are not met - a functional pressure brought about by the uniqueness of the appositional construction and lack of a comparable option for indicating disjoint reference.

His analysis for these examples assumes that there are two formal-functional systems, partially overlapping, which organise switch-reference in Central Yup'ik Eskimo. The first system is the system of inflectional categories, and the surface syntactic analysis it presents based on the inflectional notions of subject, transitivity, clause, sentence. It is in terms of such notions that the 'ideal' version of switch-reference is formulated. The second system is the system of rhetorical structure. An idiosyncratic definition is given of this (p.292): 'by which I mean the structural analysis of the surface utterance in Central Yup'ik that is evident from intonation, external sandhi, and sentence adverbial choice and placement'. Basically, the system of rhetorical structure is centred around discourse level prosodic systems, but with some non-prosodic additions. On the basis of such markings, he defines a hierarchy of units of rhetorical structure. The general argument is that narrative performance is better rendered in a kind of line, verse and stanza poetic or dramatic format, than in terms of inflectionally defined units such as clause and sentence.

Woodbury says that, particularly in narrative, units of rhetorical structure often set the boundaries within which switch-reference operates, even when they are at variance with inflectionally defined units like clause and sentence, which are canonically seen as setting the bounds of switch-reference marking.

The units of rhetorical structure in Central Yup'ik, from smallest to greatest, are: WORD; MINIMAL INTONATION UNIT; LINE; SUBGROUP; GROUP; SECTION. Sandhi joins words to form minimal intonation units which have one of four basic intonation contours. The line is bounded by a pause or breath or emphatic closure of an intonation contour. Only certain sequences of minimal intonation units are allowed to co-occur as lines. The pauses between groups are longer than those between lines. The first word of a group is often a sentence adverbial particle or enclitic. Sections are bounded by long pauses and tend to end with a short group with a particular intonation contour. They are felt to have unity of content by speakers. One of the main arguments for the claim that such a system of rhetorical structure actually exists in the language is the degree to which intonationally identifiable units of rhetorical structure coincide with the placement of enclitics and

sentence adverbial particles.

The functions of rhetorical structure in Central Yup'ik are explicated by Woodbury (1983:302). Its semantic functions are not very interesting. But, he says: 'Syntactically, rhetorical structure cannot be said merely to be read off, that is, determined by, inflectionally signalled surface syntactic structure, for it often carries original, non-recoverable syntactic information'. The effects on switch-reference provide one of the arguments for this conclusion.

In the terms of the system of inflection, a (major) sentence is defined around a main clause which is independent or has participial mood. However chains of 'SS-marked' appositional mood clauses may also occur. In narrative, main clauses can be scarce, while appositional chains are common. However as I noted above, the appositional clauses do not maintain the same referent as subject throughout; there are cases where contiguous appositional mood clauses have different rather than same subjects. These are cases of 'unexpected SS marking'.

Woodbury claims that if one takes rhetorical structure into account, these switches in subject from one appositional mood clause to another are predictable. The rule he gives (p.303) is: 'The subject of an appositional clause must be coreferent with the subject of a controlling clause or of the other appositional clauses in its own simple group or subgroup.' That is, there is no requirement for the subject of an appositional clause to be coreferent with the subject of any clause outside its own simple group, or subgroup. The reflexive vs. third person opposition follows the same rule when it occurs in appositional clauses - though in other situations, for example in oblique mood clauses, the reflexive vs. third person opposition can operate from one simple group or subgroup into the next, if its controlling clause is in a different simple group or subgroup from it.

It does not seem to be the case that when a switch in reference occurs, it functions to indicate a switch from one group to the next (a group boundary). Woodbury (1983:308) says:

It would not be possible to turn this around, and say that chains of coreferent appositional mood clauses define new discourse units each time they switch subjects, and that intonation, sentence adverbial particle and enclitic placement then follow suit. This is because not all rhetorical structure boundaries occur at switches of subject [...]. Moreover, the mere fact of a switch gives no clue as to just which intonation contour sequence will occur.

What seems to be happening here is that there is pressure for rhetorical subgroups or simple groups to be consistently SS marked, and in consequence some anomalous coreference marking occurs and one might expect that in at least some cases shifts to a new (sub)group might occur triggered by disjoint reference. From another perspective, switch-reference marking in appositional clauses is bounded to the (sub)group rather than operating just over two clauses.

Woodbury's final point is to do with differences between elicited speech and ordinary narrative. Nichols (1983:246) makes a very similar point about the languages of the Northeast Caucasus. Switch-reference that is entirely determined by the system of inflection is what Woodbury calls 'ideal' - he says it occurs all the time in elicited Yup'ik sentences, Yup'ik translations of English sentences, and even in naturally occurring Yup'ik conversational exchanges. It is contextualised pragmatically rather than embedded in long stretches of narrative text. Such sentences are readily judged for grammaticality by speakers, whereas successions of appositional clauses taken out of context are greeted with uncertainty or objected to. 'Rhetorical structure, at least in the form it takes in narrative, is so much a property of whole discourses, that its contribution to syntax is obscure out of the whole discourse context' (p.309).

3.3. Switch-reference as gapping

There are certain obvious similarities between switch-reference marking and verbal agreement, which will be highlighted in this section. On a fairly simple definition, verbal agreement is the marking on the verb of nominal features of the subject, and perhaps also of other NPs, such as number, gender and person. It functions to associate nominal arguments with their grammatical function vis-à-vis the verb, for example it helps identify the subject.

As we have seen, formally, switch-reference is almost always a verbal category, and of all verbal categories, it is *prima facie* most similar to that of verbal agreement, since in both cases an affix on the verb indicates something about a noun phrase in the clause (more specifically, something about its referent). The switch-reference marker indicates whether or not the two clauses 'agree' in the identity of their subjects. So it could be regarded as agreement at a different level; i.e. at an interclausal level.

Furthermore, it is significant that in some languages, verbal agreement and the switch-

reference marking system overlap completely, so that switch-reference markers also incorporate agreement with the subject. This is particularly common in many languages of Papua New Guinea, in contrast to North American languages, in most of which switch-reference is distinct from concord. In Papuan languages like Kate and Fore, the DS markers are typically subject-verb agreement affixes, while the SS markers are typically either zero or an invariable suffix - clearly from a functional point of view it is enough to say that the subjects are coreferential and not necessary to give any explicit indication of person, number or gender.

Haiman (1983) presents an argument for the diachronic origin of switch-reference on the basis of facts about the structural similarity between switch-reference and agreement phenomena. I outline this argument here as a counterpoint to the position taken by Givón, and because the analogies observed between switch-reference and agreement phenomena will be echoed in sections 3.4, 3.5 and 3.6. As we shall see in chapter 5, Haiman's arguments have also had some impact on the way in which switch-reference in clause chaining languages is handled formally, i.e. as coordination rather than subordination or something between the two.

The languages considered are a subset of Papuan languages with switch-reference systems, although it is claimed that there are analogs elsewhere. Haiman divides Papuan languages into two types. The first type are languages such as those mentioned above, in which SS is either zero marked or marked by an invariant morpheme, while DS is marked by a morpheme which indicates person agreement with the subject NP. In languages of the second type, SS marking verbs consist of the verb plus the normal personal affixes, while DS marking verbs have *in addition* another morpheme which functions to indicate a change in referent. This morpheme is often either a conjunction or a nominalising particle. I shall return to his argument concerning the second type of language in section 3.4.

Haiman makes the following general observations about the first group of languages:

- (i) The DS marker is to the SS marker as an agreement marker is to zero encoding. That is, SS as unmarked case is not given overt coding, and DS turns up as an agreement marker (personal affix).
- (ii) Switch-reference applies to clauses in clause chaining constructions but often not to subordinate clauses.
- (iii) Where the personal affix is a suffix, the marked clause precedes the controlling clause; where the personal affix is a prefix, it follows it.

Haiman argues that the clauses in chaining constructions are in a relation of coordination. Restriction to coordinate structures is a property of gapping, but not of other rules of deletion under identity. The generalisation in (iii) reflects the generalisation described in chapter 1 about the relation between the linear order of coordinate clauses and the type of affixation the language exhibits. Again, the relation is claimed to be a structural property characteristic of gapping and 'of no other rule which deletes under identity' (p.106). Lenakel is a test case here: it is verb medial and prefixing, and given Ross (1970) and Tai's (1969) constraints on the directionality of gapping, we can predict what in fact does happen - that in such a language the marked clause will follow the controlling clause.

On the basis of these observations, Haiman argues that switch-reference in this first type of language reduces to the familiar mechanisms of verbal concord and conjunction reduction or gapping, with the null SS marking in coordinate (chained) clauses considered to be an instance of this process.⁷

To put all this in context, we can see that what Haiman is saying is the following. The similarity between switch-reference marking and verb agreement, and the fact that switch-reference systems and agreement marking overlap, is completely unsurprising if switch-reference just is verb agreement, with deletion of the agreement (gapping) on identity in the case of SS marking.

Presumably, the assumption of conjunction reduction of bound morphemes may be explained if we see the verb agreement affixes as originally being independent pronouns, as Givón (1983) suggests. Alternatively, we can do without this step, given analogs in languages such as Turkish (Haiman 1983:112ff.) where clauses with a high degree of cohesion or continuity with the following clause (including not only identical subject, but also identical tense, mood and polarity) will appear with verbs in which the suffixes marking these categories are replaced by an invariable suffix: *-(y)A* for simultaneous activity and *-(y)Ip* for sequential activity. In chapter 2 I also noted that in most clause chaining languages, the medial verb lacks inflection for tense, mood and polarity and is understood to have the same values for these features as the final verb in the clause chain. Similarly in chapter 2, we saw that in Lenakel the person marker is not the only bound

⁷ Haiman (1983:106,108) issues two caveats. First, he notes that gapping is not usually thought of as an operation which can affect bound morphemes (but gives some other examples in a footnote). Second, no single Papuan language examined perfectly fit the pattern he proposed of DS being marked by verb + personal affix, and SS by verb + zero marking - though some, like Ono (p.108f.) came very close, and numerous other closely approximated the pattern, including some which have been mentioned in chapter 1: Kate, Kewa, Wojokeso, and Usan.

morpheme which can be gapped under identity; the tense prefix which normally follows the personal subject agreement prefix also may be.

3.4. Categorical iconicity revisited

We have seen that in general, switch-reference is regarded as a kind of nominal reference tracking, and that the idea that it involves a violation of categorical iconicity is based on this. The Principle of Categorical Iconicity, as defined by Haiman, states that a distinction is normally marked on the category to which it applies semantically - in the case of switch-reference, this is taken to be the subject NP. Although this principle seems to have some validity in general (see Haiman 1985), there are a number of problems with the way it is used in arguments concerning switch-reference. Some of these were sketched in chapter 1, and I shall here go over them in more detail.

In chapter 1 I said that there were reasons why we might question the assumption that the category to which switch-reference applies semantically is the subject NP. Switch-reference systems encode meta-level information about the relative reference and other characteristics of clauses. Although it must be acknowledged that referential meaning is classically associated just with NPs in semantic theory, I would argue that switch-reference is a clause level function which does not deal with the reference of NPs as such but with degrees and types of cohesion between eventualities. This position is supported by the other functions which switch-reference markers have.

Further support for this position is provided by the fact that there are numerous cases where a particular type of meaning may be encoded either nominally or verbally. For example, the fact that an eventuality is iterated may be indicated crosslinguistically either on the verb or adverbial elements or by using a distributively quantified NP, or even in English by a 'floating quantifier'. Stirling (1985a) gives more discussion of this point. Compare the following English sentences, which all describe iterated events of pizza eating.

- (5) a. Each student ate a pizza for lunch.
b. Every day the student eats a pizza.
c. The students ate a pizza each.

Similarly, certain aspectual distinctions, for example between completed and uncompleted

events, may be indicated by the definiteness of a nominal argument as well as by the form of the verb (Mourelatos 1978). In cases such as these, it has been argued that the type of meaning involved is really a type of clause meaning which may be manifested on or pertain to both nominal and verbal aspects of the clause - although even when it is marked just nominally or just verbally, there will often be implications for the other elements of the clause (again, see Stirling 1985a). It is of course logically possible to argue for meaning marked both nominally and verbally that one of these is more basic, either on the grounds that the type of meaning involved is more 'nominal' or 'verbal' inherently, or because of characteristics of the encoding such as frequency, conformity to other nominally/verbally encoded meaning, centrality or peripherality, simplicity, etc.

Granted that maintenance or discontinuity of reference may be encoded both nominally and verbally, there are a number of hypotheses we could propose to situate it within this general schema.

Most conservatively, we might argue that reference tracking is centrally nominal and that this is why switch-reference is weird, or at least why some explanation needs to be found for the fact that it is marked on the verb. It is this position which is assumed by both Haiman (1983) and Givón (1983), regardless of other differences in their theoretical stance. A more radical position to adopt would be to argue that the kind of reference tracking indicated by switch-reference systems represents not just nominal meaning, but clausal meaning, and that this is why it is possible to mark it on both nominal and verbal elements of the clause. In fact, we have seen that the type of meaning expressed by switch-reference includes but is not exhausted by maintenance of pivot reference - switch-reference systems may mark other types of clausal meaning which are normally expressed verbally, such as maintenance or discontinuity of temporal interval. Thus we have grounds for this more radical position. Thus I would argue that to talk of switch-reference in terms of violation of categorial iconicity is too simple: really what we have here is clause-level meaning, and this is able to switch marking between nominal and verbal elements.

Certain work on language typology is of relevance here, and as we shall see the violation of categorial iconicity hypothesis seems to conflict with what is known about the operation of relatively well-established typological parameters.

First, Capell (1965, 1969), largely inspired by his work on Papua New Guinea languages, has proposed a general typological distinction between languages in terms of what kind of 'concept domination' they exhibit: between what he calls 'event-dominated' and 'object-

dominated' languages. 'Object-dominated' languages exhibit elaborate systems of noun classification but have a simple verbal system; often the tense and mood of a clause are indicated by free forms placed before the verb. 'Event-dominated' languages have complicated verbs with verbal affixation for tense, mood, agreement and so on, but have little morphological elaboration of the noun; highly event-dominated languages have clause chaining with a contrast between sentence-medial and final verb forms. Various kinds of intermediate systems are possible. The 'event-dominated' label is a response to languages such as Amele, and indeed all switch-reference languages would appear to be of this type by definition.

A similar typological distinction proposed by Nichols (1986) distinguishes 'head-marking' from 'dependent-marking' languages, according to whether morphological grammatical distinctions are marked on the head or the dependent member of the relevant syntactic unit. Again, mixed and double-marked types are possible. According to Nichols, most North American and Papua New Guinea languages are head-marking. Since switch-reference is marked morphologically, provided we accept that it is a grammatical relation it should fall into the class of distinctions for which this typological classification is relevant.

Nichols gives criteria for identifying which type of marking a language exhibits at phrase, clause and sentence level. At phrase level, a head-marking language will mark possessive and adpositional phrases on the possessed noun head and the adposition head respectively. It will also lack adjective agreement with nouns in noun phrases and may even have marking on the noun head to indicate that there is adjectival modification. Dependent-marking languages, which are more familiar to English speakers, will have adjective agreement, and inflection on the possessor noun and the noun complement of an adpositional phrase. At clause level, head-marking languages mark the core syntactic relations on the verb, not on the NPs, whereas dependent-marking languages tend to have elaborate, noun-inflected case systems to perform the same function. Universally, languages are most likely to be head-marking at clause-level. At sentence level, however, dependent-marking is most common, with the subordinate clause being the one which marks the relation between it and a matrix clause. Dependent-marking at sentence level is also indicated by relativisation using a relative pronoun or zero anaphor in the relative clause, whereas the head-marking relativisation strategy is to use a headless relative construction. Many otherwise strictly head-marking languages have dependent-marking at sentence level.

There are certain obvious correlations between Nichols' typological distinction and that

proposed by Capell, especially at the level of clause structure, which is Capell's major concern. Languages classified as 'event-dominated' will also be classified as 'head-marking'. Once again, all switch-reference languages will a priori be head-marking at clause-level, and in fact those languages considered more closely in this thesis are head-marking more generally. For example, Amele has the following characteristics:

- (a) What evidence there is suggests head-marking at phrase-level. There is no marking on either head or dependent in NPs and PPs, and inalienable possession is marked by inflection on the possessed noun for the number and person of the possessor.
- (b) Core grammatical relations are, as we have seen, marked on the verb. There is no case-marking on nouns.
- (c) The relativisation strategy is head-marking, with the possibility of headless relatives occurring.
- (d) Subordinate clauses are dependent-marked, but as noted above, dependent-marking is the norm at sentence level even in the most stringently head-marked languages.

Thus, the fact that switch-reference is a way of marking reference tracking which occurs on the verb is probably a result of a more general property of the languages in which it occurs, namely that they are head-marking languages (and, more radically, 'event-dominated'). This does not mean, however, that switch-reference is 'just' the same as other types of referential-tracking. I hypothesise that switch-reference is marked on verbs in these languages because they are head-marking, but that because it is marked on verbs, this makes it possible for the switch-reference system to become a multifunctional system, through the addition of temporal meaning and perhaps other kinds of meaning which also gravitate to the verb in head-marking languages.

On the basis of the discussion in this section, I make the following claims about switch-reference. First, the type of meaning it marks is clausal in its domain, that is, it pertains to the eventuality or situation corresponding to the clause. Second, the function of switch-reference systems is best seen in terms of continuity or agreement between clauses, along particular parameters. Finally, although these parameters will usually include agreement in pivot identity (topic or participant continuity) other types of continuity or agreement may be involved, either pertaining to the pivot, or to what Givón calls 'action continuity'. Furthermore, there is an interaction between these two.

The general position which has just been described is reliant upon a notion of

'dependency' which needs to be examined in more detail. One thing that has become clear from the preceding discussion is that it makes sense to talk about the degree of **dependence** between clauses. This appears to be a function of both their closeness in the text linearly and structurally and the number of features they share. By 'features' here, I mean both syntactic features and the semantic information they encode. These include:

- (i) identity of (agentive) subject
- (ii) tense
- (iii) mood
- (iv) polarity⁸

This notion of dependence is a relatively general concept. One could also describe it in terms of the degree of **coherence** between clauses or the degree of **agreement** between clauses along certain parameters. We can also talk about the degree of **continuity** across clauses, subsuming Givón's participant and action continuity.

Clearly, languages have ways of formally encoding differing degrees of dependency. At least some and possibly all these mechanisms *also* indicate or focus on some particular feature and its contribution to the dependency or independency of the clause. It is also clear that many languages have a way of chaining clauses in a sequence which indicates that these clauses exhibit a high degree of dependency. For example, in English there is a stylistic option of producing chains of clauses with coreferential subjects using the device of nonfinite clauses (see example (4) above). As we saw in chapter 1, Amele and other Papuan languages allow chains of medial verbs, followed by a final verb, where the 'medialness' of the medial verbs and the 'finality' of the final verbs is morphologically obvious, with medial verbs receiving no absolute marking for subject agreement or tense or other features (such as modality and polarity) but are simply dependent on the final verb for these values. Haiman gave the example of Turkish mentioned earlier in this chapter, and we also saw in chapter 1 that in Swahili there is the possibility of producing clause chains very like those in switch-reference languages, but where only temporal continuity is marked, rather than nominal continuity.

We can think of switch-reference as a mechanism for indicating the relative dependency of one clause on another, which can focus on particular features of the clause. In general, the focus in switch-reference systems is on identity of the pivot participant. However, as we saw in chapter 2, other foci are possible.

⁸ As we shall see, these features overlap with the 'transitivity features' to be discussed in the section 3.5.

In fact, there are two ways in which we could see switch-reference as fitting into a continuum of dependency marking devices. The presence of switch-reference marking *per se* is an index of semantic dependence between clauses, but it is also important to take account of the fact that SS marking indicates a greater degree of dependence than DS marking. There is evidence for both these claims.

For example, Haiman (1983:120f.) discusses Hua, a language in which there are two kinds of medial verb types, which differ in the nature of the medial verb desinence. In the first kind, the desinence indicates that the clauses are conjoined and signals switch-reference. In such cases, the marked dependent clause must agree with the following controlling clause in tense, mood and polarity, and in addition 'tense iconicity' must be observed; that is, the order of clauses must mirror the order of events. There are a number of exceptions to this general characterisation, all of which pertain to DS clauses: agreement in polarity is not obligatory for DS clauses, DS marked verbs can be independently inflected for tense, whereas SS marked verbs cannot, and future tense DS clauses need not agree with the final clause in mood. So although all switch-reference marked medial clauses are to some degree semantically dependent on the following clause, clearly DS clauses are less dependent than SS ones. Haiman defines this dependency or cohesion as coordination. That is, he sees the dependency as an index of coordination.

The other type of medial verb in Hua has a desinence identical with the personal desinence found on a variety of subordinate clauses of time, place and condition and on all relative clauses. There is no possibility of switch-reference, and this, Haiman says, is explained by the fact that this desinence never gaps. None of the other dependency constraints apply to these medial verbs. Haiman suggests that these independent, subordinate clauses semantically express presuppositions.

The same pattern occurs in other languages. For example in Chuave, the mood and epistemic validity of switch-reference clauses are dependent on the final clause. In other words, in Hua and other languages, clauses which are semantically independent of the following clause simply fail to mark switch-reference. They can be but need not be identical to it, not just in subject reference, but also in tense and other grammatical categories. So switch-reference marking seems to indicate semantic dependency between clauses. We could also see a continuum of dependency: SS marked clauses are most dependent, then DS marked clauses, then subordinate, non-switch-reference marked clauses. Haiman (1983:121-2) notes the ambivalent status of DS marking (i.e. as dependent and independent) and suggests this may explain the possibility of the DS

morpheme developing into or from a marker of subordination.

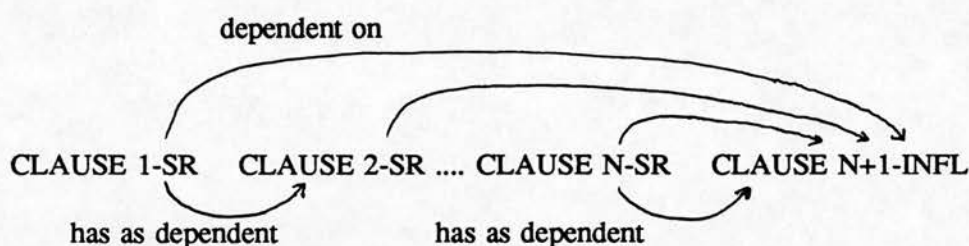
This ambivalent status of DS marking also means that some languages are better described by saying that DS marking serves to indicate or is associated with independent clauses, whereas SS marking serves to indicate or is associated with dependent clauses. This is true of Hua to a certain extent, and is also true of Lenakel, which was discussed in chapter 2. In Lenakel, DS marked clauses simply have the form of independent sentences, and in particular have independent tense marking, whereas SS marked clauses must agree with the controlling clause as to their tense.

Givón (1983:65) also talks about the degree of dependence between clauses with respect to the opposition in English between finite clauses with overt NP subjects, and nonfinite, participial or nominalised clauses. He sees finiteness as corresponding to or indicating the '*degree of independence*, or conversely, [...] *degree of dependence or binding*' between clauses (p.65). This dependency has two main elements to it, he says. On the one hand there is the degree of temporal and causal independence of the event from other events, and on the other there is the degree of independent control exercised by the subject/agent of the clause.

Givón claims that each of these functional/semantic dimensions is coded in an iconic fashion: temporal/causal independence is coded by independent or 'free' tense and aspect marking on the verb, and independent control of the subject/agent is coded by its overt expression, via case-marking, grammatical agreement or pronoun status, as an agent. Finite clauses have both; other clauses receive less coding: the verb is dependent for reading of its tense/aspect on the immediate verbal context; and the subject/agent tends to be expressed as zero and is thus dependent for its referential interpretation on the overtly expressed subjects of other verbs.

In summary, in a clause-chaining language, or in any language in which switch-reference clauses lack independent finite inflection and agree with the controlling or final verb for it, switch-reference itself indicates dependence of the marked clause on the clause with the relevant inflection. This is often a matter of temporal dependence. In other languages in which switch-reference marked clauses may be subordinate, the marking may indicate the syntactic dependence of the clause and perhaps in addition, other information about the temporal or logical relation between the two clauses. Notice, though, that in either case there is a sense in which one could see the controlling clause as being dependent upon the switch-reference clause, in that the switch-reference marking restricts its pivot NP

reference, usually in advance. The following diagram indicates this reciprocal dependency. 'INFL' stands for all the independent morphology which a final verb may have, possibly including tense, modality, aspect and polarity.



In concluding this section, I will review the ways in which the theoretical positions of Givón and Haiman are relevant to the ideas which have been presented.

Givón introduces the concepts of topic continuity and action continuity and several times notes that the two are not independent. Sometimes a particular grammatical sign may indicate continuity or discontinuity in either, depending on other aspects of the interpretation. For example, use of a personal pronoun in English often indicates coreference, and a new subject/topic will precipitate a move to the next level of continuity device, i.e. to use of a fully lexical NP. However, such a shift to use of a lexical NP may also signal a break in action continuity rather than in topic continuity. See examples (6) and (7) from Givón (1983:60).

(6) He came into the room, looked around and sat down. *He* was tired and confused; *he* slumped in his chair and waited....

(7) He came into the room, looked around and sat down. *The man in the blue suit* was tall and well dressed, middle aged but still in full vigor...

In (7), the escalation in strategy from pronouns to fully lexical definite NPs has been precipitated not by referent discontinuity, which is no greater than in (6), but by action discontinuity; there is a larger thematic break imposed by the writer and this is signalled by choosing the more discontinuous strategy.

Givón also points to the possibility of grammatical devices being multifunctional. For example he describes passive voice as 'a complex functional domain' (p.55).

If one adopted Givón's position, and accepted that although the verbal morphology system is concerned with action continuity, there is often an interaction between topic and action

continuity, it would seem reasonable to make a case of the following kind in order to account for the functional extensions of switch-reference described in chapter 2. Although switch-reference may have pronominal origins, and functions to mark topic (dis)continuity, it also functions in some languages to mark action (dis)continuity *as well* (in contrast to the examples of strategy escalation Givón gives which may mark *either* topic or action discontinuity). That is, either switch-reference is a complex functional domain like passive, or at least it is one of those continuity devices which is regularly used to indicate both topic continuity and action continuity. The fact that switch-reference does end up on the verb and perhaps forms a portmanteau morph with other verbal inflection only means it would be more likely for it to have mixed functions.

Turning now to Haiman (1983), we saw earlier that he describes one type of switch-reference system which occurs in Papuan languages in terms of coordination. He also equates coordination with dependency or cohesion between clauses, and notes that SS indicates a correspondingly greater degree of dependency or coherence than DS. With respect to the other type of switch-reference system he identifies in languages from this geographical area, Haiman goes even further in developing the suggestion that switch-reference marks the degree of **coherence** of clauses in discourse.

This second type of switch-reference occurs in languages in which SS marking verbs consist of the verb stem plus normal personal affixes, while DS marking verbs in addition have another morpheme which functions to indicate disjoint reference. This morpheme is often either a conjunction or a nominaliser, i.e. DS marking is signalled by an extra nominalising particle or a conjunction added to the SS form. So it seems that historically, a morpheme whose original function was to mark a relation between the dependent and controlling clauses has come to be used to mark DS. Examples of such languages include Maring, where SS verbs just have a personal affix, but DS marking verbs have in addition a suffix *-k*, a morpheme which is glossed as a subordinator or conjunction. Similarly, in Daga, DS marking verbs may have either the suffix *-wa*, a 'substantive clitic' which occurs on NPs and nominalised clauses, or the sentence connective augmental coordinator *amba*, 'and then'. Haiman (1983:116) says: 'The reason both morphemes may perform this function, I believe, is that both may mark a relative lack of cohesion between their own clause and the one following'.

Haiman attempts to explain this hypothesised historical development as follows: 'I suggest that a common function of both nominalisation and overt conjunction (as opposed to simple parataxis) is to signal a lack of cohesion between the clause on which they occur

and the clause with which it is joined' (p.107). He says, 'The characteristic index of cohesion is not "same x" but rather "necessarily same x" as in the other clause' - where x may be subject, mood, tense, object, polarity and so on. Conversely, the characteristic index of lack of cohesion is not "different x" but rather "independent x". Thus, he argues that the original and motivated meaning of conjunction and nominalisation is to signal *indifference* to the identity of the subjects of dependent and controlling clauses. He then says, 'By a familiar semantic specialisation, the portion of the meaning of a category which is unique to it ([...]its par excellence meaning) is easily reinterpreted as its basic meaning: thus indifference as to coreference or "open reference" may be reinterpreted as a signal of different reference'.

In any case, and regardless of any possible historical origins, the following point which he makes seems very reasonable (p.127):

Formally, the contrast between SS and DS clauses in languages like Maring, Daga and Latin may be diagrammed as this:

SS:	S ₁		S ₂
DS:	S ₁	X	S ₂

The interposition of any formal element X between coordinate clauses is sufficient to suggest a semantic disassociation between them. In Daga, Maring, and possibly Chuave, this disassociation suggests that the two conjoined clauses have different *subjects*. In other languages, it may be that they occur at *different times*. [...] Conversely, the reduction of either S₁ or S₂ may be taken as an iconic index of the fusion of the events described therein, so that they are perceived as one event....

That is, Haiman identifies two conditions, of semantic separation and of semantic fusion. He claims that the extra marking 'X' which usually characterises DS morphology is literally a graphic indicator of separation or lack of cohesion between the two clauses; SS morphology lacks this additional marking and so literally does not separate the two clauses to the same extent.

3.5. Transitivity

Hopper & Thompson (1980) define 'transitivity' as a cluster of morphosyntactic and semantic properties all basically concerned with the effectiveness with which an action is 'carried-over' or 'transferred' from an agent to a patient (though this does not mean that

transitivity properties are only relevant where agent and patient are grammaticised categories). These properties each have a particular value for 'high' or 'low' transitivity, and taken together enable a transitivity value to be assigned to the clause as a whole. Clearly, then, transitivity as a global property of the clause is something of a continuum. Hopper & Thompson do formulate a universal principle, which states that whenever an *obligatory* pairing of two transitivity features occurs in the morphosyntax or semantics of a clause, the paired features are always on the same side of the high/low transitivity scale (p.254). The relevant properties and their values are summarised in following table.⁹

	HIGH TRANSITIVITY	LOW TRANSITIVITY
(A) PARTICIPANTS	two	one
(B) KINESIS	actions	states
(C) ASPECT	completed	uncompleted
(D) PUNCTUALITY	punctual	nonpunctual
(E) VOLITIONALITY OF A	volitional	nonvolitional
(F) AFFIRMATION	affirmative	negative
(G) MODE	realis	irrealis
(H) AGENCY OF A	high	low
(I) AFFECTEDNESS OF P	total	partial
(J) INDIVIDUATION OF P	[proper human, animate concrete singular count referential, definite]	[common inanimate abstract plural mass non-referential]

Hopper & Thompson further argue for a correlation between transitivity and the discourse functional notion of **grounding**, whereby a distinction is made between **foregrounded** and **backgrounded** clauses: high transitivity is correlated with foregrounding, and low transitivity with backgrounding. They summarise the distinction, which is more fully described by Grimes (1975), Hopper (1979), and others, as follows (p.280):

That part of a discourse which does not immediately and crucially contribute to the speaker's goal, but which merely assists, amplifies, or comments on it, is referred to as BACKGROUND. By contrast the material which supplies the main points of the discourse is known as FOREGROUND. Linguistic features associated with the distinction between foreground and background are referred to as GROUNDING.

The distinction is most applicable to narrative texts, and another way to look at it (cf.

⁹ As in chapter 2, I use Dixon's (1979) symbols A, P and S to stand for the three types of syntactic argument of transitive and intransitive verbs.

Hopper & Thompson 1980:280 citing Polanyi-Bowditch) is to see narrative as consisting of two kinds of structures; a temporal structure of sequentially occurring events, and a durative/descriptive structure which provides a spatial, characterological and durative context for these events. Numerous languages have morphological and syntactic devices which reflect grounding, and these range from discourse particles to the elaboration of verbal paradigms of tense-aspect.

There are several potential points of contact between switch-reference, transitivity and grounding. First, SS and DS marking correlate in certain respects with foregrounding and backgrounding respectively. Hopper & Thompson point out that chains of foregrounded clauses (within one episode) typically continue to talk about the same participants rather than introducing new ones, thereby maintaining same subject. Furthermore, chains of foregrounded clauses tend to present sequential events, while simultaneous events (along with states and on-going or repeated events) appear in background clauses.¹⁰ We have seen that marking of sequential versus simultaneous events is a common additional element of meaning of switch-reference markers, and that while the SS/DS and sequential/simultaneous distinction is usually completely cross-cutting, sometimes a naturalness assumption is made on which SS is correlated with sequentiality, and DS with simultaneity.

Second, DS marking could be seen as indicating a switch in grounding (from foreground to background or vice versa). In Amele, DS marking is used not just if there is disjoint subject reference, but if there is an interruption in the spatio-temporal setting, or a change in modality: both these could also be seen as a switch from one type of grounding to another. As we have seen, Lenakel, too, makes use of DS marking to indicate a switch between non-future and future tense - which could plausibly be seen as a realis/irrealis switch.

However, it is also true that switch-reference marking itself occurs on clauses which meet at least some of the morphosyntactic and semantic characteristics of backgrounded clauses. Switch-reference markers usually occur on subordinate clauses or the medial clauses in clause chains. Subordinate clauses tend to be backgrounded (and low in transitivity), and

¹⁰ More strictly, it is said that foregrounded clauses are ordered in a temporal sequence and a change of order means a change in the order of the real-world events, in comparison with background clauses which are not ordered temporally with respect to one another, and may even be movable with respect to foreground clauses.

medial clauses are non-finite, again an indicator of backgrounding (and low transitivity).¹¹ Finally, Hopper & Thompson note that low transitivity clauses may be ones in which one argument is deleted, and the verb takes a form which would not be possible in a full version of the clause. We may see switch-reference clauses as having this property too, especially in languages with a medial/finite clause distinction. The relevant missing element, though, is not an argument, but tense. Although the NP arguments may be omitted, the verb is certainly in a form with which they could occur, whereas the presence of a tense morpheme in these languages is dependent on the absence of a switch-reference morpheme.

Interestingly, Hopper & Thompson (1980:265) mention Eastern Pomo as a language in which morphosyntactic correlates of higher versus lower agency of the subject are displayed in clauses with only one NP argument (in fact, this also occurs in Eastern Pomo to some degree in clauses with two arguments). As we saw in chapter 2, this is called 'Split-S marking': the single argument of the intransitive verb takes case marking appropriate for agents or for patients depending on the degree of control it exercises over the activity. Hopper & Thompson correlate high agentivity with high transitivity (that is, it is one component of high transitivity), while low agentivity is correlated with low transitivity. In chapter 2, the following examples were given in illustration of this property of Eastern Pomo.

- (8) a. wí čeexélka 'I'm slipping'
 b. háa čeexélka 'I'm sliding'
- (9) a. wí baatéčki 'I got bumped accidentally'
 b. háa baatéčki 'I got bumped on purpose'

We also saw that there is an interesting interaction between split ergativity in Eastern Pomo and its switch-reference system. In summary, the SS/DS markers signal not simply continuity of reference, but more complexly, continuity of reference and of agentivity value: SS always implies both same referent and same agentivity or control value (whether high or low), while DS marks a discontinuity in either reference or agentivity value (high to low or low to high).

More generally, we can see switch-reference as being generally a backgrounding mechanism within which SS marks continuance of the same level of transitivity across

¹¹ However, there may be a distinction between subordinate clauses and medial clauses in terms of transitivity: medial clauses may be higher in transitivity.

clauses, or of the same (degree of) grounding across clauses, whereas DS marks a shift in level of transitivity or grounding.

It seems, then, that the 'extended functions' of switch-reference systems are quite naturally explained as indicating shifts in level of transitivity or grounding. But is there any obvious way to reconcile this with the 'core function' of switch-reference systems to mark topic continuity? As mentioned above, there does seem to be a correlation between coreference and foregrounding and disjoint reference and backgrounding, but there is no clear direct correlation between co/disjoint reference and transitivity.

3.6. Switch-reference as agreement between eventualities

We have seen examples of switch-reference markers used to signal continuity or discontinuity, across syntactically related clauses, of the following elements of clausal meaning:

- (i) the reference of one or more nuclear NPs, usually subjects, but sometimes objects, and sometimes more appropriately characterised as agents.
- (ii) the agentivity value assigned to an important protagonist.
- (iii) the tense, or time of the event.
- (iv) the location of the event.
- (v) the mood of the clause (realis/irrealis).
- (vi) continuance of or shift out of a cohesive sequence of events.

In all the languages looked at, the switch-reference system marked at least the first of these meaning contrasts, so there is reason to believe that the identity of a major protagonist, whether regarded as subject or agent, is in some sense basic. Yet the fact that such a range of meaning contrasts is covered crosslinguistically, and the fact that they cohere to cover the familiar range of elements of clause meaning, suggests that it may be more plausible to see switch-reference markers as indeed pertaining to the whole clause, and as types of clause linkage rather than as mere devices of referential tracking. Further support for this position has been given in this chapter.

If a clause is taken as describing a situation or eventuality, with its component elements being the type of situation (from the lexical meaning of the verb plus aspect and mood),

participants in participant roles, and spatio-temporal location, then it seems that switch-reference marking can be used to indicate continuity or change in any of these except in the actual nature of the activity or state as encoded in the lexical meaning of the verb. If we further postulate larger units made up of clusters of eventualities, to form episodes or a rhetorical context (not necessarily identical to Woodbury's rhetorical units), this accounts for use (vi). It would seem that at the level of universal grammar, SS markers (the unmarked case) have the capacity to signal maintenance of the clausal status quo, and the extension of the current event sequence, while DS markers have the potential to signal change in at least one of the clausal elements, or a shift out of the current event sequence. There must then be certain parameters set by individual languages, as to what will count as an important enough shift in the clausal elements to warrant marking with DS. It seems likely that, even at the universal level, reference of participants may be the most salient characteristic of such event sequences.

Although the signalling of (dis)continuity in the reference of major participants is always one of the functions of switch-reference systems, in languages such as the ones described in chapter 2 there are circumstances in which it is given lower priority than the signalling of (dis)continuity in some other parameter of the eventuality. The following relatively simplistic rules summarise the findings of chapter 2 in the light of the discussion in this chapter, and capture the functional hierarchies and defaults which seem to govern the functioning of switch-reference marking in these languages.

(a) For Eastern Pomo:

- if agentivity changes, use DS;
- otherwise, if reference changes, use DS;
- otherwise (i.e. if agentivity and reference stay the same), use SS.

Or from the point of view of interpretation:

- if SS, then you know reference and agentivity are the same;
- if DS, the default is that just reference has changed;
- if DS and reference has not changed, agentivity has changed.

(b) For Lenakel:

- if tense/mood changes, use DS;
- otherwise, if reference changes, use DS;
- otherwise, if tense and reference stay the same, use SS.

From the point of view of interpretation:

if SS is used, assume tense and reference are the same;
if DS is used, check whether reference is the same or not
(by seeing if there is a full NP for the new subject);
if there is not, assume reference is the same and just tense changed.

(c) For Amele:

if time, place, event sequence, mood changes, use DS;
otherwise, if reference changes, use DS;
otherwise, use SS.

From the point of view of interpretation:

if SS is used, assume same reference, and general continuity of event
(unless otherwise indicated);
if DS is used, assume disjoint reference;
if this doesn't work, assume some other change.

Exactly how one is to account for switch-reference in particular languages is a different question, and one which we will go some way towards answering in chapter 5. Although a syntactic binding account can probably be made to work for canonical cases, and perhaps even for some languages exhibiting noncanonical switch-reference, explanatory adequacy might be better served by a theory which encodes the notions of eventuality and event sequence mentioned above.

4.1. Introduction

In chapters 5 and 6 formal accounts are proposed for switch-reference and for logophoricity. The proposals are made within the framework of a semantics based on Discourse Representation Theory, which is described in 4.2. The semantics is part of a grammar formalism called Unification Categorical Grammar, outlined in 4.3. In 4.4, the choice of this theoretical framework is justified.

4.2. Discourse Representation Theory

Discourse Representation Theory (DR Theory) was developed by Hans Kamp (1981a), though closely related ideas are presented in Karttunen (1976), Heim (1982) and Kamp (1983). It is a formal semantic theory which has its origins in a desire to formulate a model-theoretic semantics for natural language which would be applicable to discourse phenomena, specifically anaphoric and tense phenomena. It departs from Fregean semantics in taking discourse rather than the sentence to be the unit over which truth conditions are defined. Apart from this it does not represent a radical departure from a standard formal semantics, based on first order predicate calculus and model-theoretic interpretation.

The extensions proposed by Kamp (1981a) in order to treat natural language discourse phenomena reflect his particular goals, namely of accounting for the anaphoric behaviour of personal pronouns, and formulating a plausible account of the truth conditions of so-called 'donkey sentences' such as those in (1a,b) (see Geach 1962, Evans 1977, 1980). He took the latter task to involve giving general accounts of the conditional, and of the meaning of indefinite descriptions, as well as of pronominal anaphora.

- (1) a. If Pedro owns a donkey he beats it.
b. Every farmer who owns a donkey beats it.

Donkey sentences are conditional and universal sentences containing scope-dependent indefinite NPs and pronominal anaphors which are neither bound syntactically by the indefinite antecedent, nor even in its scope, at least on a normal logical translation of the sentence. The particular problem they present is thus that of providing a univocal treatment of the indefinite NP, eg. *a donkey*, which accounts for the fact that it is perceived

to have universal force in this syntactic context, without violating the tradition that indefinites in general have existential force. Thus, it is generally agreed (though cf. Cooper 1983) that the truth conditions for (1a) should be as in (2), where the indefinite description reemerges as a universal quantifier.

(2) $\forall x (\text{Donkey}(x) \ \& \ \text{Owns}(\text{Pedro}, x) \rightarrow \text{Beats}(\text{Pedro}, x))$

Such examples are a manifestation of the equivalence between \forall with wide and \exists with narrow scope, but are complicated by the particular anaphoric binding relationships which must be allowed for, i.e. between the indefinite in the subordinate clause and the pronoun in the matrix clause. We shall see how they are handled below.

In addition to the question of how to handle donkey sentences, and partly as a result of the account given for them, two other general issues are addressed by DR Theory.

The first is whether a univocal account of pronominal anaphora is possible at some level of representation. Various distinctions have been made in the literature between different kinds of interpretation of anaphoric pronouns. In particular, 'coreference' and 'variable binding' interpretations have been distinguished (eg. see Reinhart 1983). The pronouns in the donkey sentences are problematic for this distinction, because they appear to fit neither category; this led Evans (1977) to propose a third category of 'E-type' pronouns. Even if it were necessary or desirable to postulate this kind of ambiguity for pronouns, the question would remain of what the nature of the supposed 'variable binding' relation actually is, since as has frequently been noted, we would like to be able to invoke it to relate pairs of NPs which don't seem to be in the required syntactic or logical configuration.

Kamp claims^{to} provide a unified account of the different uses of personal pronouns. Variable binding and coreference anaphors are represented in the same way, but receive different model-theoretic interpretations because of the larger contexts in which they appear. In DR Theory, the semantic representation is in the form of 'Discourse Representation Structures' (DRSs) built up algorithmically on the basis of the syntactic analysis (see below). These representations are then interpreted by embedding into a model. At the level of representation construction there is a single rule which applies to all personal pronouns equally, introducing into the universe of the DRS a 'discourse marker' (DM) representing the pronoun, and adding to the body of the DRS an anaphoric condition linking this discourse marker to some other discourse marker in the universe. Quantificational meaning is shifted into the embedding procedure, and it is at this level that

the perceived differences in the interpretation of pronouns are handled, rather than by any difference in their representation. This move also allows Kamp to give a satisfactory analysis of the donkey sentences, as we shall see. One major factor in making a univocal account possible is that the same construction rule operates both at the level of the principle DRS and at the level of subordinate DRSs, where due to the embedding conditions, subordinate levels in effect represent contexts in which the DM representations for pronouns are bound, and it is only at the top level that DMs are fully available for reference. These changes enable Kamp to give a uniform account of anaphoric relations between NPs, which does not make use of their differing referential characteristics. Because he distinguishes these two levels of interpretation, he is able to reject a variable binding/coreference distinction entirely.

The second issue is the nature of the anaphoric relation between introductory, indefinite NPs (traditionally taken to be nonreferring) and following definite referential pronouns. This is related to the first issue since it too concerns the definition of a level of semantic representation at which NPs are treated uniformly regardless of their referential characteristics. Kamp's account allows indefinite descriptions to be represented in the same way as referential terms such as proper names, rather than being given a distinct representation as existential quantifiers. When an indefinite has existential force it has it in virtue of the particular role played by the clause containing it within the sentence or discourse of which it is a part, i.e. clausal roles may impose existential or universal readings on indefinites. Thus Kamp's explanation for the donkey sentence phenomenon hinges on the fact that the indefinite NP both has the same referential characteristics as normal indefinite NPs, and receives universal force because of the clausal context in which it occurs.

DR Theory of course handles anaphoric relations which cross sentence boundaries, and does so in the same way as it handles anaphoric relations within sentences. Notice that binding-like intersentential relations occur as well as coreference ones, as in example (3), where such relations link *each boy* and *his* as well as *a book* and *it*. Although the version of DR Theory defined in Kamp (1983a) doesn't handle these cases, it seems possible to extend the theory to do so (see Roberts 1986, Stirling 1988a).

(3) Mary gave each boy a book. Then she marked his name off the list as having received it.

Discourse Representation Theory thus claims to describe a level of processing of natural

language intermediate between syntax and semantic interpretation, at which discourse connections that may extend beyond the bounds of the sentence (centrally, anaphora) are taken account of. Having such a level apparently allows a uniform account of NP representation and anaphoric relations at least at this stage in the processing.

As we have seen, there are two components to the theory. The first involves the construction of the basic units of representation, the Discourse Representation Structures, on the basis of the syntactic analysis. These can be regarded as partial models, typically with small, finite domains, describing how the world ought to be if the sentence is true. The second component is the determination of the semantic content of these representations. This involves their embedding in the model, and assignment of a truthconditional interpretation to them. Key tools of DR Theory are thus the construction algorithm, and the definition of proper embedding and concomitant definition of truth.

The Discourse Representation Structures consist of *discourse markers* and a set of *conditions*. For any DRS K , I shall use the notation $U.K$ to indicate its universe, and $Con.K$ to indicate the set of conditions it contains.

As part of the construction process, NPs license the introduction of discourse markers into the universe of the DRS, and also license certain conditions which constrain their instantiation in the model. Discourse markers are represented by indexed lower case letters, $\{x_1, x_2, \dots, x_n\}$. They are formal entities of a uniform kind in the sense that no notational distinction is made between constants, variables, or arbitrary objects. However, as we shall see, the conditions introduced by different kinds of NPs do have the effect of licencing introduction of their DMs into different places in the DRS, eg. into the principal universe of discourse or that of some subordinate DRS, and licencing different additional conditions according to the logical operators their determiners are associated with.¹

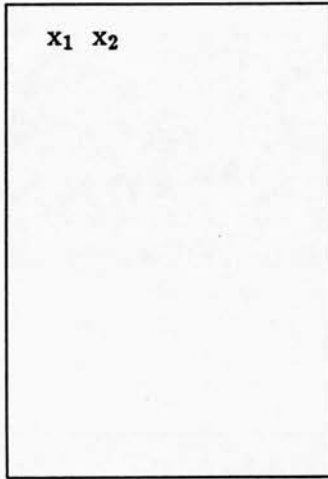
Thus, processing of sentence (4) would result in the introduction of two discourse markers x_1 and x_2 , licensed by the NPs *Fred* and *Mary*. The DRS for this sentence at this stage would look like (5). DRSs are normally represented notationally as box diagrams, where a box encloses a DRS, the universe of DMs is listed horizontally along the top and the

¹ Also, different interpretations are placed on DMs in Kamp's *explication*. For example Kamp (1983: 4) says that if the NP is definite the DM whose introduction it prompts acts as a 'placeholder' for the object to which the phrase refers, whereas if it is not definite the marker functions more or less as a variable bound by the quantification the NP expresses - although he does follow this remark with a caveat! Similarly, Kamp (1981a) talks about a universally quantified antecedent in terms of 'some arbitrary item x '.

conditions are listed vertically below them.

(4) Fred likes Mary.

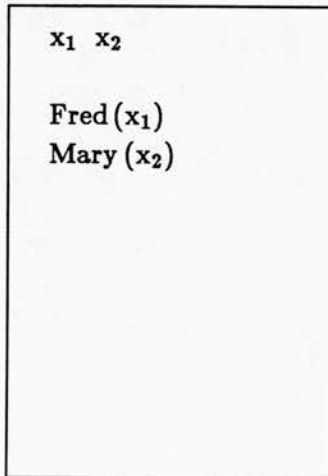
(5)



There are several kinds of conditions. Most straightforwardly, full NPs license the introduction of an atomic condition which either states that the DM for that NP has the property expressed by the common noun, or for proper names, identifies the DM with the referent of the proper name, eg. $cat(x_i)$ for *a cat* or $Mary(x_i)$ for *Mary*.

We can thus extend the DRS in (5) by introducing two NP-based conditions of this kind.

(6)



Other conditions result from the substitution of the appropriate DM for the corresponding NP in the sentence, and are thus based on the predicate, eg. $run(x_i)$, $like(x_i, x_j)$. A

condition of this kind completes the DRS for sentence (4). It is assumed that the conditions listed within the DRS are to be interpreted as if conjoined.

(7)

x_1	x_2
Fred(x_1)	
Mary(x_2)	
like(x_1, x_2)	

Supposing the discourse of which (4) is the beginning were to continue with the sentences in (8).

(8) He gave her a cat. It is large and cunning.

The assumption of DR Theory is that the full discourse, including intersentential anaphoric relations, can be represented by appending the new DMs and conditions required for the interpretation of these subsequent sentences, to the DRS opened for the initial sentence. Thus (9) would be the representation for the whole discourse consisting of (4) and (8).

(9)

x_1	x_2	x_3	x_4	x_5	x_6
Fred(x_1)					
Mary(x_2)					
like(x_1, x_2)					
cat(x_4)					
give(x_3, x_6, x_4)					
$x_3 = x_1$					
large(x_5)					
cunning(x_5)					
$x_5 = x_4$					
$x_6 = x_2$					

As (9) illustrates, processing of second and subsequent sentences in a discourse proceeds relative to the DRS already constructed; that is, this DRS provides a context for the interpretation of subsequent sentences.

What this amounts to is just that discourse markers introduced when pronouns - and indeed anaphoric full NPs - are processed are, as part of the construction process, linked with discourse markers introduced earlier, via a condition which may be represented as $x_i = x_j$.

In making the required links, it is not actually important whether one introduces a new DM for a pronoun and then sets it equal with some earlier DM (as has been done above), or simply uses the earlier DM in the new condition introduced by the predicate associated with the pronoun. The reason for Kamp taking the first course was to make the analogy between anaphoric and deictic pronouns more explicit (Kamp 1983: 8, n.4).

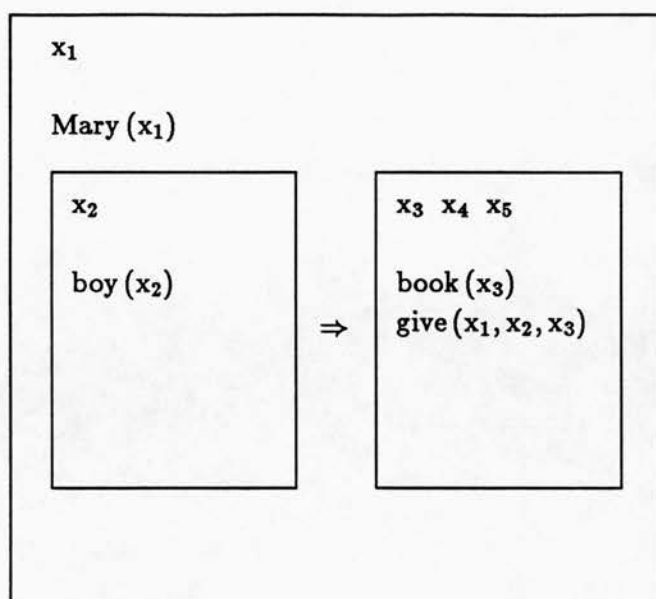
I noted above that existential and universal import are handled in the embedding definition and the way it applies to the representation of the clause as a whole, rather than in the representation of NPs. The existential import of *a cat* in the example discussed above is thus not apparent from the DM or condition introduced by this NP, but the result of the embedding definition.

Informally, the truth condition for a DRS K states that it is true relative to a model M if and only if K is compatible with M , where compatibility of K and M can be defined as the existence of a proper embedding of K into M , and a proper embedding is given by an embedding function which instantiates all the DMs in the universe of K into the universe of M ; these instantiations must satisfy all the conditions stated in K . Thus the existential force which most indefinites have comes from the implicit existential quantifier in the embedding condition: 'there is a proper embedding/an embedding function....'

Now let us turn to a fourth type of condition, which has the form $K_i \Rightarrow K_j$. Both universal sentences and conditionals license the introduction of two 'subDRSs', the first representing the antecedent and the second the consequent, linked by an operator represented as ' \Rightarrow ' or 'ifthen'. That is, sentences with universal quantification introduced by *every* are treated as expressing generalised conditionals. For example, the sentence in (10) (cf. (3)) would have the representation in (11).

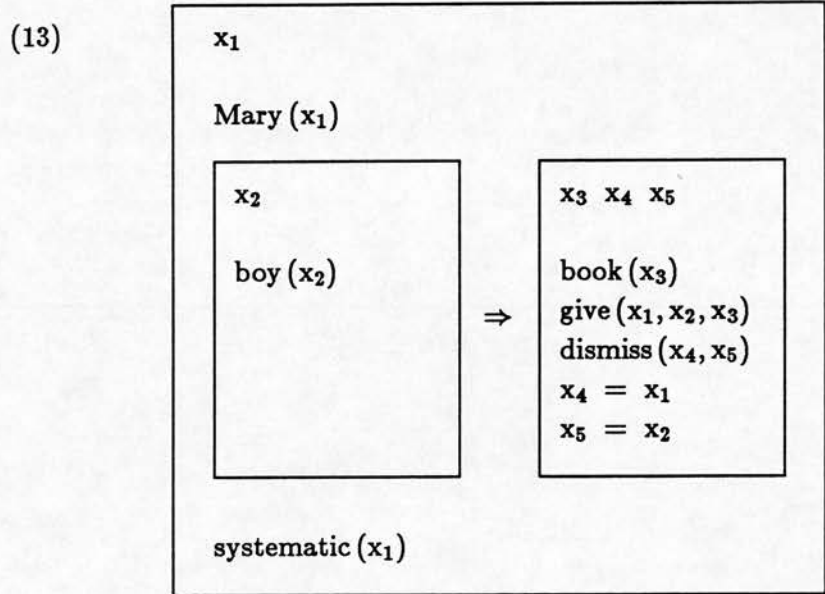
(10) Mary gave each boy a book.

(11)



Just as in example (9), this DRS will be extended in various ways to incorporate DMs and conditions from subsequent sentences in the discourse. If a following sentence maintains the binding, as in the original example (3), the DMs and conditions will be added to the consequent subDRS; if it does not the subDRS will be closed and they will be added to the principle DRS. Thus, (13) will be the DRS for the extended discourse (12).

(12) Then she dismissed him. She is very systematic.



If a DRS K has as its principle condition a statement of the form $K_i \Rightarrow K_j$, a proper embedding of K will then have to conform to the embedding condition for ' \Rightarrow ', which states that every proper embedding of the antecedent subDRS K_i must be extendable to a proper embedding of K_j . The notion of extension desired is one in which the extended embedding function must assign the same values to all the DMs in K_i and also assign values to the DMs in K_j , such that the values assigned satisfy the conditions in K_i and K_j . By virtue of this analysis, every DM in the universe of the antecedent DRS K_i is universally quantified, which is of course how 'donkey sentences' can be handled, and indeed all DMs in the consequent are universally quantified too - unless they are proper names, which always give rise to a DM in the principle DRS rather than in a subDRS.

The anaphoric linking relation indicates that the two DMs have the same instantiation in the model, a definition which is general over both existential and universal embeddings. More explicitly, 'having the same embedding' means that, for DMs x_i and x_j , when $x_i = x_j$, then for any embedding function f_i which instantiates x_i in the model as a , there must be an embedding function f_j which instantiates x_j in the model as a . Disjoint reference

may be indicated by an anaphoric linking condition of the form $x_i \neq x_j$, interpreted as meaning that there is no such embedding function.²

Notice the assumption that anaphoric pronouns select their referents from certain sets of antecedently available entities. The selection set for an anaphoric pronoun is made up of DMs from the universe of the representation which has been constructed in response to the antecedent discourse. Kamp has nothing to say about the strategies used in choosing a referent for a particular anaphoric pronoun; he is interested just in the construction of the selection set. However, this process is not unconstrained: structural restrictions are imposed on anaphoric linkage in DRT, by appealing to a subordination relation between DRSs, and defining a notion of 'accessible DM' in terms of it. The DM x_i is accessible to the pronoun a if x belongs to the universe of the DRS immediately enclosing a or to some superordinate DRS. Since the DMs introduced by proper names are inserted into the principal DRS, they are always accessible to any other DM. However, Chierchia & Rooth (1984) argue that the notion of accessible DM can be dispensed with because the restrictions it is designed to capture fall out anyway from the recursive definition of truth in terms of embedding functions.

This is the basis of DR Theory. Before moving on, I shall give a more formal statement of the definitions of truth and satisfaction with respect to a model.

The algorithm from syntactic structures to Discourse Representation Structures has not been given in any detail here, because the grammar formalism to be used in chapters 5 and 6 will be described in 4.3. Input to the level of discourse representation is assumed to be syntactic phrase markers (or parts thereof) of a familiar kind. In the original account, DRS construction proceeded top down and assumed the prior availability of a full syntactic parse tree for the sentence, however more recent work postulates a bottom-up version of DRS construction similar to the compositional construction of logical formulae in Montague Semantics. See eg. Klein (1986), and the theory described in 4.3.

A **model** M is a pair $\langle A, F \rangle$, where A is the universe of discourse, and F is a valuation. An **embedding** is a partial function f from the set of entities V to A , where V is the set from which the elements are drawn to make up the universes of the DRSs.

² An alternative formulation would be to describe the linking relation in terms of *cosatisfaction*, so that the condition $x_i = x_j$ holds just in case there is some extension of the embedding function f_i of x_i , which also satisfies the conditions predicated of x_j .

Truth is defined:

(i) A DRS K is *true* in a model M iff there is an embedding function f such that $U.K$ is included in the domain of f , and $M, f \models K$.

(ii) $M, f \models K$ iff $M, f \models \phi$ for every $\phi \in \text{Con}.K$.

If the following kinds of conditions occur in DRSs (including two not discussed above):

- (i) Atomic: $R(x_1, \dots, x_n)$ or $x_i = x_j$;
- (ii) Universal: $K_1 \Rightarrow K_2$;
- (iii) Negative: $\neg K$;
- (iv) Disjunctive: $K_1 \vee K_2$.

Then satisfaction is defined:

- (i) $M, f \models R(x_1, \dots, x_n)$ iff $\langle f(x_1), \dots, f(x_n) \rangle \in F(R)$.
- (ii) $M, f \models x_i = x_j$ iff $f(x_i) = f(x_j)$.
- (iii) $M, f \models K_1 \Rightarrow K_2$ iff for every extension g of f such that $M, g \models K_1$, there is an extension h of g such that $M, h \models K_2$.
- (iv) $M, f \models \neg K$ iff there is no extension g of f such that $M, g \models K$.
- (v) $M, f \models K_1 \vee K_2$ iff there is an extension g of f such that $M, g \models K_1$ or $M, g \models K_2$.

The original account has been extended in a number of ways which will be important in the proposals made in chapters 5 and 6: to handle plural as well as singular NPs, and to handle temporal reference phenomena. Other extensions which will not be considered here include work on belief sentences (Asher 1986, Zeevat 1986), and VP ellipsis (Klein 1986).

For work on plurals in DR Theory, see Kamp (1982), Chao (1986), Stirling (1985b, 1988a) among others. To introduce notational conventions for handling plural NPs is a straightforward matter. Just as singular NPs license the introduction of discourse markers represented by the lower case letters x_1, x_2, \dots, x_n , similarly we can say that plural NPs license the introduction of plural discourse markers, represented by upper case letters X_1, X_2, \dots, X_n .

To start with, we can see such DMs as simply markers of grammatical number features on the NP, and as acting as an instruction imposing a minimal constraint on instantiation: eg. as a requirement that the DM should be mapped onto some plural object in the model.

However, what the semantic status of these DMs is, and whether we should use them for all plural NPs, are more problematic questions. For one thing, the relationship of plurality to quantification - which as we have seen is handled in DR Theory at the level of clause embedding rather than in NP representation - is not entirely straightforward (see Stirling 1985b). For another, there is evidence to suggest that it is unwise (even if possible) to think of natural language plurality in terms of the set-theoretic entities familiar from logic and mathematics; rather we need a concept like Links' (1983) 'pluralities' or Bealer's (1982) 'aggregates/collections'. However, these differ from 'sets' in ways which are not important for us here.

Having introduced plural DMs, we are free to use the anaphoric linking relation to connect two pluralities, with the definition of coembedding already given requiring that their instantiations must be equivalent sets. However, we also need to account for anaphoric relations between plural and singular NPs, as in example (14).

(14) The girls came in. One girl was carrying a stack of books.

To account for this and other relations involving pluralities, we use normal set-theoretic relations such as 'element of' and 'subset of' relations, and introduce new anaphoric linkage conditions accordingly, eg. we can say: $x_i \in X_j$, or $X_i \subset X_j$.

It is also straightforward to extend the original account to incorporate an event theory which enables us to handle temporal and aspectual phenomena, in particular the kinds of temporal relations which occur in narrative discourse. See Partee (1984), Hinrichs (1986), Kamp (1979, 1981b), Kamp & Rohrer (1983) etc. The extensions which have been proposed in the literature have generally represented a combination of an interval semantics for tense which takes tense to refer to temporal entities, a Davidsonian event semantics (Davidson 1967), in which events as well as temporal intervals are added to the ontology of the theory and may be referred to and quantified over, and an aspectual classification of 'eventualities' (or situations) which derives from original work by Mourelatos (1978) and others. Although it is often necessary to refer to temporal entities such as reference times, eventualities are taken as primitive.

The basic assumption is that tense is anaphoric: the tense of each clause refers to a 'reference time', a temporal interval situated in time relative to the speech time and relative to a reference time provided by the previous discourse. The temporal extensions to DR Theory which have been proposed have been designed to account especially for (past

tense) narrative discourse, which has as one of its most obvious characteristics that each event clause progressively moves on the temporal reference, by moving the action forward in time. That is, events are sequentially ordered, with the time of each successive event following that of the previous one. State clauses do not involve a forward movement in reference time, but rather describe how things were at the time of the last-mentioned event. So we start with the speech time, an event clause will introduce an event situated in time in the past relative to the speech time, a subsequent event will be situated in the past relative to the speech time but following the reference time introduced by the first event, and so on. As an example, see the text in (15).

- (15)
- | | | |
|----------------------------------|--------------------------|-----------------------|
| Ronnie got up, | went to the window, | and raised the blind. |
| e_1 | e_2 | e_3 |
| It was light outside. | He pulled the blind down | and went back to bed. |
| s_1 | e_4 | e_5 |
| He wasn't ready to face the day. | He was too hungover. | |
| s_2 | s_3 | |

To construct an event-theoretic DRS for this text, we need to introduce new types of discourse markers standing for different sorts of eventualities: at least e_i for 'event' and s_i for 'state', perhaps a_i for 'eventuality' subsuming both of these, and maybe others. We also need the discourse markers r_s (or *now*) for the speech time; and r_n for various reference times.

These DMs may be related using the anaphoric linkage condition '=', but we also need new types of conditions to relate them:

(i) Each clause will license the introduction of an e or s DM, and a condition such as: $get_up(e_1, x_1)$.

(ii) Conditions specifying ordering relations between event DMs are also necessary: '<' for the relation of complete precedence between events, and '⊇' for the relation of partial or complete overlap.

In the discourse representation for example (13), we would need to specify that $e_1 < e_2 < e_3 < e_4 < e_5 < r_s$, and that $e_3 \subseteq s_1$, $e_5 \subseteq s_2$ and $e_5 \subseteq s_3$.

It is possible to capture this information either directly, by specifying the relevant conditions as holding between the eventualities, as above, or indirectly, by causing each new event clause not only to introduce an event DM but also to shift the reference time forward; each new event DM is then ordered with respect to such reference times. On this approach we would start with r_0 ; e_1 occurs within the reference time r_0 ; the clause introducing e_1 also introduces a new reference time r_1 which e_1 is ordered as preceding and which itself precedes the speech time; then e_2 is specified as occurring within the reference time r_1 ; etc. The more simple direct approach will be taken in this thesis; reference times if required can be defined in terms of the eventualities. However, in the DRS in (16), representing the simplified version of (15) given in (15'), the full details are given.

(15') Ronnie got up and looked out. It was light. He went back to bed.

(16)

r_0	e_1	r_1	e_2	r_2	e_3	r_3	s_1	now	x_1
Ronnie(x_1)									
$r_1 := r_0$									
$e_1 \subseteq r_0$									
get_up(e_1, x_1)									
$e_1 < r_1 < \text{now} \quad (r_p := r_1)$									
$e_2 \subseteq r_1$									
look_out(e_2, x_1)									
$e_2 < r_2 < \text{now} \quad (r_p := r_2)$									
$r_3 \subseteq s_1$									
light(s_1)									
$e_3 \subseteq r_2$									
go_back(e_3, x_1)									
$e_3 < r_3 < \text{now} \quad (r_p := r_3)$									

Each new past tense event sentence is specified to occur within the then-current reference time r_p , and it subsequently causes the reference time to be shifted to a new reference time which follows the just introduced event.³ State sentences are required to include the current reference time (but need not overlap the event that led to the introduction of that reference time). Unlike events, states don't have the effect of updating or moving forward the reference time r_p .

³ The notation ':= ' indicates that r_p is set to a new reference time.

The whole DRS is true just in case proper embeddings can be found in the model for the event entities and state entities and for the reference times such that these are in the correct temporal relations to each other.

We saw above that the subDRSs introduced by universal quantification or conditionals can be seen as 'semantic subordination' contexts. These may represent anaphoric relations across sentence boundaries, which seem to involve maintenance of the binding context introduced in the first sentence. More recent work on other kinds of subordinate contexts has focussed on the anaphoric relations possible within and between subDRSs. See Roberts (1986, Stirling 1985b, 1988a) for discussion of 'modal subordination' contexts triggered by modal elements, and distributive/iterative contexts triggered by quantification and aspect. Such accounts involve the imposition of even more structure within the DRS than we have already seen, with the possibility of various kinds of subordinate DRS being defined, along with various kinds of relations between subordinate DRSs. Once again, the contexts may be used to represent chunks of several sentences.

In summary, DR Theory offers a promising formal account for certain systematic effects in discourse. In addition to intersentential relations and relations between eventualities, it has shown itself to be particularly successful at handling cases which apparently involve binding but which neither syntactic nor logical definitions of binding relations have been helpful in explaining: donkey sentences, where DR Theory succeeds due to its treatment of quantificational meaning, and reference within quantified and modal contexts, where it succeeds due to the notion of a DRS, which allows one to define semantic contexts intermediate between the representation of a sentence and the representation for an entire discourse.

4.3. Unification Categorical Grammar

The grammar formalism used in chapters 5 and 6 is a version of Unification Categorical Grammar (UCG), which incorporates a semantics based on DR Theory. UCG is described in Zeevat, Klein & Calder (1987) and Klein (1988). It is one of a family of grammar formalisms which have as their basic operation **unification**: informally, two grammatical objects may unify if they encode no incompatible information, where the unification of two representations is a third representation which combines all the complete specifications in the first two, and thus results in a sharing of the information in each. Other grammar formalisms of this kind, notably HPSG (Head-driven Phrase Structure Grammar) and

PATR-II, to which UCG owes many insights, are described in Shieber (1986) and Pollard & Sag (1987); see also Calder, Klein & Moens (eds.) (1987) and Haddock, Klein & Morrill (eds.) (1987). The operation of unification is also important in GPSG (Generalised Phrase Structure Grammar), LFG (Lexical Functional Grammar) and Prolog, among other formal systems.

The basic grammatical object in UCG is the *sign* (a term borrowed from Saussure via HPSG). The sign is a list of phonological, syntactic and semantic information: *phonology:syntactic category:semantics*. These three levels of representation are treated as equal partners in constructing analyses of linguistic expressions. In some versions of the theory, contextual, or discourse resolution information, is also specified (eg. see Zeevat 1987).

I shall use the sign for the English third person singular present tense intransitive verb form *walks* as an illustration. The sign for this verb form would be as in (17). For typographical convenience, the three levels of representation are listed vertically, on separate lines. The various parts of the representation will be explained in turn.⁴

(17)

w walks

S[FIN]/ *w*: NP[3,SG,SBJ]: x_1

[s_1] [*walk'*(s_1, x_1) & $s_1 \supseteq \text{now}$]

Phonological representations are expressed in ordinary orthography here, and nothing further will be said about this level of representation. Note that *w* is a variable standing for some phonological/orthographic string.

The syntactic representation is a categorial grammar representation of the kind found in Montague Grammar. Categorial grammar began with Ajdukiewicz (1935) and has since been developed further by Bar-Hillel, Lambek, and Montague and more recently by a range of investigators such as Steedman and Pollard. The basic principle of categorial grammars is that the full range of syntactic categories necessary in the syntax of a language can be defined using a very small number of basic categories, if one specifies more complex categories in terms of information about what kind of basic categories they need to

⁴ The exposition which follows departs in certain minor respects, mainly notational, from the version of the theory presented in Zeevat, Klein & Calder (1987) and Klein (1988). Where relevant, the changes are noted.

combine with in order to result in other basic categories. Thus, the basic categories in UCG as in standard categorial grammar are S, NP and N. Complex categories are built up from these using slash notation, for example the category for an intransitive verb is S/NP, i.e. it is the kind of thing which needs to combine with a NP in order to make a sentence.

Often a notational distinction is made in categorial grammars between forwards and backwards combination, using the forwards slash / and the backwards slash \: this simply indicates the direction in the linear string in which the category is looking to be satisfied. However, information about linear ordering is normally handled at the phonological level in UCG.

Let us adopt the terminological convention of referring to the element on the righthand side of the major slash (the element which the category is looking to combine with) as the **argument** or **active sign**, and the element on the left of the slash as the **functor** or **result sign**.

It is normal in categorial grammars, including UCG, for basic categories to be further constrained by morpho-syntactic information in the form of features, for example in the grammar of English the category NP may be specified for the features [PERSON], [NUMBER] and [CASE], which take values {1,2,3}, {SG,PL}, and {SBJ,OBJ}. Similarly the category S may be specified for a feature [VFORM] with a set of values including {FIN}. Thus in example (17), the NP category of the active sign is constrained to be third person, singular subjective case. The S category of the result is specified to be a finite verb, which indicates that it agrees with and assigns case to its subject and situates the eventuality in time relative to the time of speech. As we shall see, signs may be prevented from applying (as arguments) to other (functor) signs by these syntactic feature specifications, and also by restrictions imposed at the level of semantics. If their syntactic categories conflict, or it is not possible to construct a new semantics by unification, the denotation is dropped.

The syntactic categories used in UCG are defined in (18).

(18)

1. S, N, NP are basic categories.
2. Every basic category is a category.
3. If X is a category and S is a sign, then X/S is a category.

This definition encapsulates the distinction between the categorial grammar used in UCG

and standard categorial grammars. In normal categorial grammars, the argument, or active edge, of a complex category, is just another basic category. In UCG, it is a sign, which means that it may include phonological and semantic information as well as morpho-syntactic information: thus, phonological and semantic constraints may be specified on the argument. So in our example, (17), the syntactic category of the verb form has as its result the category S with the feature value [FIN], indicating that it is a verb form which takes tense and subject agreement. The active sign is the sign $w: NP[3,SG,SBJ]: x_1$; a partial description which must be satisfied by any potential argument, where the phonology and the semantics are relatively unspecified but the argument is constrained to have the category NP and furthermore to be a third person singular NP in subjective case.

The semantic representation is expressed in the semantic representation language InL (for Indexed Language), which is based on DR Theory.

The major similarity between InL and DR Theory is in its algebraic structure. Just like DR Theory, InL has only two connectives for building complex formulae: an implication ' \Rightarrow ' that introduces universal quantification, and a conjunction '&' (which as we saw is understood in DR Theory representation to link the conditions in a DRS). These allow the construction of complex formulae of the following general forms:

$$\begin{aligned} &[\phi \Rightarrow \psi] \\ &[\phi \ \& \ \psi] \end{aligned}$$

As in DR Theory, the semantic formula as a whole carries existential import.

InL is similar to the event-theoretic versions of DR Theory described in section 4.2 in that it incorporates a Davidsonian event theory (Davidson 1976), which involves the use of sorted DMs for eventualities of various kinds: e for events, s for states, etc. Every verb is assumed to introduce an eventuality DM. Thus in the example given, the present tense verb form *walks* introduces a state DM s_1 . The condition $walk'(s_1, x_1)$ is to be read 'there is a state s_1 of walking and x_1 is the agent of s_1 '. As in 4.2, also, tense is handled as a temporal relation of precedence or overlap with respect to the time of utterance, which I shall henceforth represent as the special DM *now*.

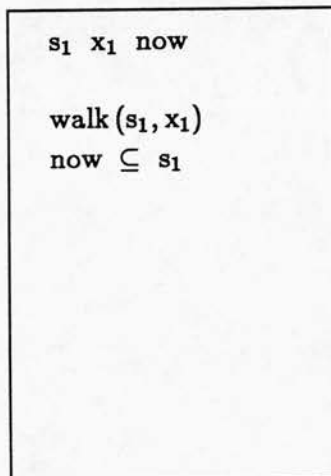
There are a number of minor differences between InL and DR Theory, for example that the formulas of InL are linear rather than represented in the box diagram notation of DR Theory. The main difference between the two theories is in the status of the DMs. InL does not make the same kind of distinction as DR Theory between the universe of a DRS

and the conditions in it. Instead, it is assumed that every formula ϕ introduces a designated variable v called its **index**. This is written in square brackets in prenex position, thus: $[v] \phi$. Hence the formula in example (17) has s_1 as its index. An index is taken to act as a binding operator, with its formula as its scope; thus designation as an index is equivalent to introduction into the universe of a DRS as a discourse marker.

It is assumed that the first argument of any atomic formula will be the index for that formula. To reduce typographical complexity, prenex indices appearing within subformulae are often omitted in the notation.

Despite this difference, the semantic representations expressed in InL are in all essential respects equivalent to event-theoretical DR Theory representations of a familiar kind: the universe of discourse markers may be scattered throughout the list of semantic conditions, but the cumulative set of DMs associated with a complex condition can be constructed by a simple recursive definition. Thus, the example (17) has the equivalent DRS representation (19).

(19)



These changes have several advantages (see Zeevat, Klein & Calder 1987, Klein 1988): InL allows a rule by rule construction of semantic representations; offers more options in assigning constituency, and associating different sorts of DMs with different sorts of constituents; and allows a better treatment of modifiers.

The set of signs which (17) can combine with includes (20).

(20)

Kim
NP[3,SG,⌋]
kim'(x₂)

Here, the underscore in the NP's feature list is used to indicate that the NP is defined for the feature [CASE], but as yet unspecified as to its value. This sign meets all the constraints specified on the argument of (17): it is a NP, and it is third person singular. It contains no information about case, which is compatible with specification for subjective case. It contains no information which is in conflict with the information in the argument sign of (17), i.e. there are no features for which both signs are specified but have different values, nor are there any features for which one sign is defined but the other is not. The sign in (17) and the sign in (20) can thus **unify** with one another.

In order to understand the process of unification, it is useful to think of grammatical objects as partial information specifications. Two objects may be ranked according to how informative they are: if one grammatical object contains at least as much information as the other, we say that the first is subsumed by the second, the two are compatible, and they may unify, with the more informative of the two substituting for the other. Thus the process of unification involves the uniform substitution of a values for all occurrences of any variable and the filling in of unspecified feature values and other unspecified information. The result of unifying (17) with (20) is (21):

(21)

Kim walks
S[FIN]/*Kim*:NP[3,SG,SBJ]: kim'(x₂)
[s₁] [walk'(s₁,x₂) & s₁ ⊇ now & kim'(x₂)]

The sign (20) has substituted for the argument sign of (17). This has had the effect of further specifying the phonology and semantics of the result sign. The phonological representation for (20) has substituted for the phonological variable *w*, the DM *x*₁ has unified with the DM *x*₂, and the semantic condition *kim'*(*x*₂) has been added to the semantics.

This illustrates a further difference from standard categorial grammars: representations for complex expressions are built up in the way familiar from categorial grammars, except that unification makes possible information flow between an argument and the sign resulting from its application.

The final step in the process is for the now satisfied and redundant active sign to be stripped off, leaving the final result sign (22):

(22)

Kim walks

S[FIN]

[s₁] [walk'(s₁,x₂) & s₁ \supseteq now & kim'(x₂)]

Thus the different levels of representation are built up simultaneously using the same basic operation of unification: the compositional construction of all three levels takes place in the same manner, i.e. by the accretion of constraints on the possible representations.

More formally, the only rule of grammar in UCG (the application rule) is defined as follows:

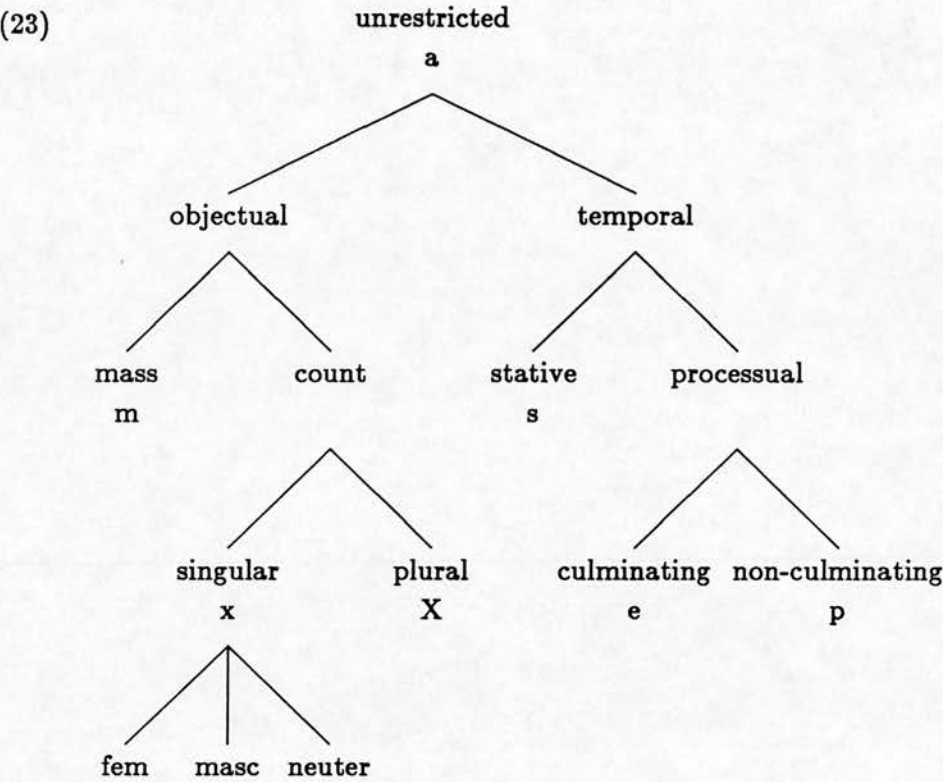
- a. $Phon:Cat/Sign_1:Sem \quad Sign_2 \rightarrow [Phon:Cat/Sign_1:Sem]\sigma,$
b. $Phon:Cat/Sign_1:Sem \quad Sign_2 \rightarrow \sigma[Phon:Cat/Sign_1:Sem],$
where σ is the most general unifier of $Sign_1$ and $Sign_2$.

This covers both forwards and backwards functional application. To check whether some potential argument sign actually does match the active edge of the functor sign, it is necessary to check whether there is some substitution of values for variables such that the two signs are equal under substitution. Such a substitution is a unifier.

A few further points need to be made. We have seen that sorted eventuality indices are introduced by verbs and I mentioned that different aspectual sorts were distinguished, eg. for events and states. In fact, all kinds of ontological types are formalised in UCG by dividing the semantic variables into sorts. A sort is a bundle of features associated with a particular variable. This conception of sorts allows operations of unification to be performed on them, which provides a way of expressing selectional restrictions, and allows the sort of a variable to be incrementally specified by different references to it by different subexpressions. To avoid typographical complexity, these sort feature bundles are often represented notationally by special variable letters: thus, *e* for event, *s* for state. Other standard distinctions are between singular and plural individual sorts, count and mass sorts, etc. The ontology of sort assumed for English, for example, is represented in the hierarchical structure in (23) from Klein (1988: 13): for any pair of sorts connected by a branch, the higher of the two is less informative than and subsumes the lower, and thus may be replaced by it via an operation of unification. Thus, the sort *a*, being completely unspecified, may unify with and be replaced by a variable of any other sort.⁵ However,

⁵ In following chapters, I shall in fact restrict my use of the sort *a* to eventualities unspecified for aspect.

sorts which are merely sisters in the hierarchy, and not connected by a subsumption relation, cannot be unified.



The second point to note concerns features and feature structures. I have had little to say about feature structures here, but in fact all grammatical information in this type of grammar formalism can be seen as consisting of feature structures, from lexical information upwards. See Shieber (1986), Pollard & Sag (1987) and Smolka (1988) for more detailed discussion and formal definitions of feature structures and their logic.

Due to the way complex expressions are built up using the operation of unification, any features specified on the category for a verb will be inherited by the category of the sentence. Thus in our example, both verb and sentence are specified as [FIN], as the result of specifying this feature value for the category S in the result portion of the verb's category.

Another way to indicate feature sharing is by using multiple occurrences of a subscripted tag \square , which indicates that the subscripted categories must agree in all feature values (see Pollard & Sag 1987: 32f. etc.). As an illustration of how feature sharing works, consider an example adapted from Pollard & Sag. Suppose we use feature structures to keep track of office personnel, as in (24). Feature labels as well as values are given here, and instead

of being listed horizontally, the features are listed vertically, for ease of exposition.

(24)	NAME	ABRAMS
	NI	NW 19 50 92 B
MANAGER	SECRETARY	NAME JONES

	NAME	DEVITO
	NI	AB 54 64 87 A
ASST-MANAGER	SECRETARY	NAME JONES

(24) encodes the information that both Abrams and Devito have a secretary called Jones. Subsequent information may reveal that these are two different individuals, eg. we may find out that they have different National Insurance numbers. In comparison, the feature structure in (25) indicates that Abrams and Devito **share** a secretary named Jones. (24) subsumes (25), since (25) contains all the information that (24) does plus information that there is a single secretary who is shared. Thus (25) is one possible further specification of (24).

(25)	NAME	ABRAMS
	NI	NW 19 50 92 B
MANAGER	SECRETARY	NAME JONES

	NAME	DEVITO
	NI	AB 54 64 87 A
ASST-MANAGER	SECRETARY	□

4.4. Conclusion

Since DR Theory claims to present a level of description intermediate to syntax and semantic interpretation, which is specifically designed to account for anaphoric phenomena and other systematic discourse effects, it seems likely that it might be useful in accounting for switch-reference. In fact, apart from the potential interest and particular suitability of an account in DR Theory, one might well argue that given its expressed aims, the theory is obliged to say something about switch-reference data. I shall briefly explore the main reasons for proposing a DR Theory based account.

We saw in chapter 1 that switch-reference pivot NPs are not in the syntactic configuration

which is required for the Binding Principles to apply, so that according to the Binding Theory these NPs should be completely free in reference with respect to one another. Since they are not, Finer (1985a, b) proposes a generalised binding account. However, even this does not allow switch-reference relations to be handled by a syntactic binding account, since switch-reference may also relate coordinated or chained clauses, or clauses which are not linearly adjacent. It is also necessary to account for the use of switch-reference marked recapitulation clauses to relate sentences. Yet, switch-reference is also a highly systematic phenomenon, and there are good reasons for taking it to be relatively 'syntactic' rather than pragmatic or functional (cf. Finer 1985a, b for such arguments). Switch-reference may appear to be a device for eliminating possible ambiguity in discourse, but it redundantly occurs even in environments that have no potential ambiguity, and it doesn't occur in certain constructions where it would be expected, were it governed exclusively by functional/pragmatic considerations. Rather than make a distinction for switch-reference analogous to that made for anaphora between 'bound' and 'discourse' anaphora (Reinhart 1983), it seems sensible to see whether DR Theory cannot say something about switch-reference, given that it has been so successful in accounting for other kinds of 'binding' outside syntactic or logical binding contexts, and in unifying sentence internal and sentence external anaphora.

From what we have seen in chapters 1 to 3, it is also clear that relations between events, of the kind discussed by Partee (1984) etc. are also implicated in switch-reference. An event-theoretical version of DR Theory of the kind described above should be able to account for this aspect of the meaning of switch-reference markers.

In addition, in DR Theory, it is clear that a DRS may represent more than one simple clause. In fact not only can DRSs represent sequences of sentences, but we have seen that various types of relations between subDRSs have been proposed which can account for some of the structure of discourses above the level of the sentence. Further, there is some underlying and implicit assumption that DRS's correspond to cohesive event sequences, especially if one considers an event version of DR Theory - so that there is some coherence of the sentences represented in a DRS in terms of genre and in terms of the overall temporal interval involved. For example, if one is representing a narrative structure one assumes temporal continuity within the larger DRS which encompasses the events, and if some interpolated future event occurs, it will certainly appear in a DRS on its own and off the main timeline/event sequence. Thus, DR Theory offers various mechanisms by which one would be able to define discourse semantic relations between complexes of eventualities, of the kind that we have seen in chapter 2 are sometimes

implicated in switch-reference relations. At the moment DR Theory looks at quite a narrow range of discourse continuity and needs enrichment. In giving an account for switch-reference, I will be generally interested in defining (meta)conditions which specify types of DRS and the way they are related to other DRSs.

The reason for using a variant of DR Theory embedded within UCG is so as to allow an account of the syntax of switch-reference as well as its semantics, in fact an account of syntax and semantics which proceeds simultaneously. Because a categorial syntax is used, the syntactic category of the switch-reference marker may encode the (partially specified) sign for the controlling clause, with which the marked clause is to combine, offering the potential for specifying a variety of constraints, both syntactic and semantic, on this following clause.

Finally, since versions of DR Theory such as InL take processing considerations seriously, and have been implemented computationally, it is interesting to consider within this framework what is involved in accounting for the kind of restricted information the switch-reference markers provide, before the controlling clause comes along.

5.1. Introduction

In this chapter, I illustrate the kind of treatment I propose for switch-reference systems by presenting a formal account of switch-reference in Amele. At the end of the chapter, some suggestions are made about how such an account could be used to handle switch-reference in Eastern Pomo, Lenakel and other languages.

Two factors have dictated the choice of Amele as an illustrative language. First, it is a clause chaining language, and switch-reference languages of this kind have received little formal attention (cf. Finer 1985 a,b, Tsujimura 1987). Second, it exhibits the full range of nonreferential functional extensions of switch-reference marking described in chapter 2, including unexpected uses of SS marking with impersonal controlling clauses, and unexpected uses of DS marking triggered by changes other than in reference of the subject NPs.

Unification Categorical Grammar (UCG) will be used to formalise the account. Since UCG incorporates a semantics based on Discourse Representation Theory (DR Theory), the proposed account illustrates the way DR Theory can be used to handle switch-reference phenomena, both in Amele and more generally. It was shown in chapter 4 that the semantic representations of UCG can readily be translated into more familiar DR Theory representations.

The basis for the account is the idea developed in chapter 3 that switch-reference should be regarded as a kind of interclausal agreement. We saw in chapter 4 that in event versions of DR Theory, and in particular in UCG, it is assumed that the universe of discourse contains discourse markers or indices representing the eventualities introduced by clauses. In UCG these indices are sorted according to the aspectual type of the eventuality. In the account proposed here, it is claimed that in order to handle switch-reference, even more structure should be introduced into these eventuality indices, so that they encode all or most clause-level information i.e. transitivity information in the sense of Hopper & Thompson (1980). Switch-reference markers then are seen as indicating the degree of agreement or disagreement between these **structured eventuality indices**.

In section 5.2, some preliminary remarks are made about Amele and its typological

characteristics. Section 5.3 is concerned with the syntax of switch-reference in Amele, and in particular considers the question of how the syntactic/semantic relation between marked and controlling clauses is to be handled, and the question of what set of lexical features is necessary to characterise Amele verbs and account for the inflectional dependency of the marked verb on the controlling verb. Then, in 5.4, we consider the semantics of switch-reference in Amele. This has two main elements: how to isolate the switch-reference pivot, and how to handle functional extensions to the switch-reference system. In this section we also consider how to handle cases where one of the switch-reference pivots is plural, and how the account fits into a more general account of textual structure, which enables us to provide a treatment of recapitulation clauses. In section 5.5 it is shown that the account can be extended to include the impersonal constructions described in chapter 2. Finally, in section 5.6, I show how the account can be modified to apply to other languages with switch-reference, including those which exhibit non-referential functional extensions and those which do not.

5.2. Amele

Amele is a Papuan language with about 6000 speakers, who live in an area of approximately 120 square kilometers between the Gum and Gogol Rivers, just south of the town of Madang in Papua New Guinea. Although they have lived on the coast for some centuries, the people were originally highlanders, and the language resembles other Highland languages. It is the largest of the Gum family of languages, and has four distinct dialects. The data here is from Hua, the prestige and literary dialect. Although the language has been mentioned in various works on Papua New Guinea languages (eg. Capell 1969), substantial work on it has been done only by Roberts (1987, 1988), following on from a relatively scanty beginning made by Wullenkord (ca. 1930). All the data in this thesis are taken from Roberts' work, which is based on recorded text material comprising some 32 different texts totalling 15,500 words, from a wide range of informants.

Basic word order in Amele is relatively strict for core constituents: S IO DO V. The verb may be followed by a subordinator, but otherwise it is always last. The order of other core constituents may vary due to a small number of thematic movement rules (Roberts 1987: 70f,161,142,147-8). These movement rules constitute evidence for a VP constituent, and Amele has other characteristics of configurational languages such as the relatively fixed word order and lack of case marking on NPs, although it also has some characteristics of

nonconfigurational languages (see Roberts 1988: 48).

Amele is a head-marking language. There is provision for marking subject and both objects on the verb, and in some cases this is obligatory. This allows extensive 'null anpahora', i.e. Amele is a 'pro-drop' language but also freely allows omission of elements besides the subject, provided they are retrieveable from the context. In some circumstances even the verbal agreement marking may be omitted, so that the minimal clause is a verb stem stripped of all its inflections. At the other extreme, it is very common for 'intraclausal pronominal copies' to accompany full NPs. These agree with the verbal markers in person and number, and function to further specify the full NPs (which are not marked for number), and to emphasise or disambiguate.

Since there is no case marking on NPs, linear position in the clause and agreement marking on the verb between them indicate the grammatical function of NPs. Amele is a Nominative-Accusative language (Roberts 1987:164).

Amele has extensive clause chaining, and also a range of subordinate constructions. A limited number of coordinated constructions also occur. Subordinate clauses normally precede the verb of the matrix clause and any arguments of that verb which are not expressed in the subordinate clause. With respect to the switch-reference system, the marked clause almost always precedes the controlling clause. Adverbial elements have relatively free word order within the clause.

It is a postpositional language, and in possessive NPs the possessor element precedes the possessed element. The structure of postpositional phrases and possessive NPs is given in (1) and (2) below; note that compound postpositions are common. The PossP is used for alienably possessed things; inalienable possession is indicated by an inflection on the noun for person and number of the possessor. Most but not all modifiers follow the noun in a NP, including determiners.

(1) PP -> N N-modifiers Postpositions

(2) PossNP -> Possessor_N Postposition_na('of') Possessed_N

Prototypical switch-reference in Amele is exemplified in (3)-(5). In addition to their other functions, the switch-reference markers indicate whether the two events are simultaneous or sequential. The structure of the verb and the morphology of the switch-reference markers

will be described in more detail in 5.3.2.¹

- (3) uqa q-it-i-me-i na Ø-i-te-i-a
 3s hit-1s-PRED-SS-3s stick give-PRED-1s-3s-TodP

He hit me and then gave me the stick. [298, (593)]²

- (4) hina ho-co-m sab je-i-a
 2s come-DS-2s food eat-3s-TodP

You came and he ate the food. [294, (559)]

- (5) ija Malolo uqa na ka
 1s Malolo 3s of_POSS car
- jic ana-g na ono nu
 road mother-3s_POSS at there for
- sum-ud-i bi-biligin ne-ce-b
 wait-3s-PRED SIM-be-DUR_1s_DS come_down-DS-3s
- tobo-co-min belo-w-an
 climb_up-DS-1s go-1d-YestP

While I waited for Malolo's car there at the main road, he came down,
 I climbed in, we two went off. [101, (Text 7); 238, (396); 297, (583)]

The long text in (6) gives a better idea of how the switch-reference system works in

¹ Unless indicated examples are from Roberts (1987). The page number and example number are given in that order in square brackets after the free gloss for the example. Sometimes an example appears more than once in Roberts' grammar and in this case all occurrences are cited. The following list of abbreviations is used in morphemic glosses:

1,2,3 = First, second, third person
 s,d,p = Singular, dual, plural number
 TodP, YestP, RemP, HabP = Today Past, Yesterday Past, Remote Past and Habitual Past tenses.
 Pres = Present Tense
 Fut, NegF = Future and Negative Future tenses
 PRED = Predicate marker
 INF = Infinitival form of the verb
 SIM = Simultaneous (the reduplicated part of simultaneous SR marking)
 DUR = Durative aspect
 CONTR = Contrafactual mood
 IMP = Imperative mood
 Q = Question particle
 NEG = Negative particle
 POSS = Possessive form (inalienable possessive inflection, or possessive postposition)
 INDEF = Indefinite pronoun

² According to Roberts (1987:313), the verb 'give' is not lexically realized in Amele, but the predicate marker -i- is required in such cases.

discourse in the language. Other long examples are given in Roberts (1987: 108, (515), (516); 101, (Text 7)). The example shows how subject NPs, other NPs and indeed verbal inflection including SS marking is omitted under identity. These 'stripped down' forms of SS-marked verbs appear to have a rather predictable distribution in text, occurring after the first use of an SS-marked verb; a fact which will have to be accounted for by the theory of textual structure.³ This example also illustrates the usefulness of switch-reference in keeping track of referents. To aid the reader in following the text, each clause is started on a new line and omitted elements are supplied in square brackets. The first clause is a recapitulation clause.

- (6)
- | | | | | | |
|-----------|--------------|------------------|--------|--------------------------|--------------|
| [mala] | odo-co-b | | | | |
| chicken | do-DS-3s | | | | |
| cudumac | uqa | da-dan-i | | bi-bil-en | |
| wallaby | 3s | SIM-confuse-PRED | | SIM-be-DUR_3s_DS | |
| macas | na | dec | gubal | h-u-me-i | |
| sea | in | from | turtle | come-PRED-SS-3s | |
| [gubal] | cudumac | gahi-d-u | | | |
| turtle | wallaby | carry-3s-PRED | | [omision SS, subj. agr.] | |
| [gubal] | [cudumac] | ah-u | | | |
| turtle | wallaby | take-PRED | | [omision SS, subj. agr.] | |
| [gubal] | macas | la | na | [cudumac] | m-ude-ce-b |
| turtle | sea | shore | on | wallaby | put-3s-DS-3s |
| [cudumac] | uqa | caj-i-me-i | | | |
| wallaby | 3s | arise-PRED-SS-3s | | | |
| [cudumac] | n-u | | | | |
| wallaby | go_down-PRED | | | [omision SS, subj. agr.] | |
| [cudumac] | bahu | nu-en | | | |
| wallaby | forest | go-3s_RemP | | | |

The chicken did that. Then while the wallaby sat there confused the turtle came out of the sea. He lifted the wallaby on his shoulder and carried him and put him on the shore. Then he (wallaby) got up and went down into the bush. [107-8, (514)]

³ Stripped down forms of sequential SS marked verbs consist of either the stem plus the predicate marker, or the stem plus subject agreement; in both cases optional object markers may also occur. Stripped down forms of simultaneous SS marked verbs, consisting of the reduplicated verb stem, may occur if the verb is followed by a verb marked for durative aspect. See Roberts (1987: 107, 236, 273, 314).

5.3. The syntax of switch-reference in Amele

A full description of the formal notation to be used in this chapter was given in chapter 4. As we saw there, in UCG, linguistic expressions are represented by **signs**, where a sign consists of phonological, syntactic and semantic information. The phonological level is represented here using ordinary orthography, and I have nothing further to say about it. The syntactic representation is in the form of a category of the kind familiar from categorial grammars. Basic categories are S and NP, which may be further constrained through the feature structures associated with them. Complex categories are built up from S and NP using slash notation, with / indicating forwards combination and \ indicating backwards combination.⁴ UCG differs from standard categorial grammars in that the element to the right of the slash in a complex category is itself a sign, i.e. it is specified for phonological and semantic information as well as syntactic information. Semantic information is represented in InL, the Indexed Language developed on the basis of DR Theory. InL is a predicate logic representation enriched with a Davidsonian event theory. In InL each linguistic expression introduces an **index** corresponding to the discourse marker introduced into the universe of a Discourse Representation Structure in DR Theory. Linguistic expressions also introduce one or more **conditions** of the same kind as are found in Discourse Representation Structures.

The syntactic representation and the semantic interpretation are built up in tandem as the signs representing linguistic expressions are combined by the operation of unification.

In this section we develop an account of the syntactic information encoded in switch-reference markers; we also sketch an account of that part of their semantic representation which pertains to the temporal relation between the clauses. In section 5.4 we give an account of the other semantic information provided by the switch-reference marker.

5.3.1. The relation between marked and controlling clauses

Finer's (1985 a,b) formal grammar of switch-reference crucially assumes that the syntactic relation between clauses linked by switch-reference marking is one of local hierarchical adjunction. This is necessary to achieve the correct structural configuration for a Binding

⁴ Normally in UCG the linear order of constituents is indicated at the phonological level.

Theory account of switch-reference. In many languages, especially from North America, switch-reference does indeed mark subordinate adverbial clauses, and in a few languages it may mark other kinds of subordinate clauses such as relative clauses or complement clauses. However, as we saw in chapter 1, in some languages switch-reference operates across coordinated or paratactic clause sequences, and in many other languages, especially from Papua New Guinea, it marks the clauses in chaining constructions.

Amele is typical of Papua New Guinea clause chaining languages. That is, one of the major interclausal syntactic relations is that holding between a dependent clause headed by an inflectionally impoverished 'medial' verb, and a final independent clause headed by a finite verb. These clauses are concatenated without subordinating or coordinating conjunctions. Very long chains of medial clauses are possible: Roberts (1987:103) notes that the maximum number of clauses per sentences in any text he looked at was 13, and frequently sentences had 10-12 clauses, with an overall average of 3 clauses per sentence.⁵

Dependency relations in clause chains

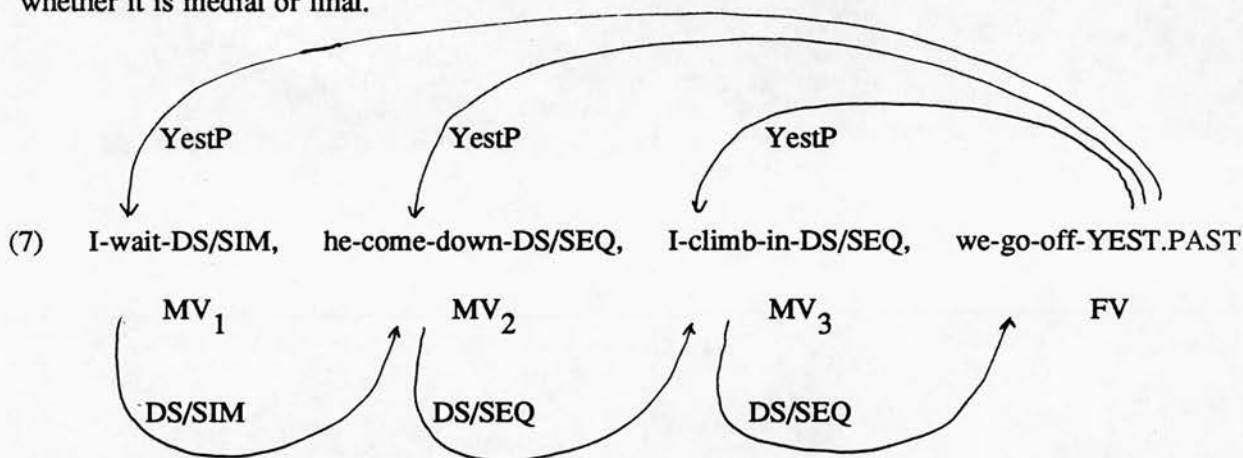
As we saw in chapter 3, in general, two types of dependency relate the clauses in a chaining construction. Medial clauses are marked for switch-reference and thereby provide information about the subject reference and other characteristics of the controlling clause. The controlling clause is usually the following clause, whether medial and itself switch-reference marked or final and hence unmarked for switch-reference. However, because medial verbs are non-finite, they are themselves dependent on the final clause for information about temporal reference, and possibly other information morphologically marked on finite verbs. This is the case whether or not the final verb is also their controlling clause for the purposes of switch-reference.⁶

Amele conforms to this general pattern. Verbs are medial by virtue of being marked for switch-reference instead of receiving the morphological marking for tense etc. characteristic of finite verbs. They are thus dependent on the final, finite verb for temporal reference. As usual, the switch-reference marking itself indicates relative temporal ordering between

⁵ Elsewhere Roberts notes that it is not uncommon to get as many as 15-20 verbs per sentence in certain kinds of narrative (Roberts 1987:293; 1988:48).

⁶ We also noted that some languages manifest 'focal' rather than 'sequential' switch-reference; in such languages all medial clauses have the final finite clause as their controlling clause for switch-reference as well as being dependent on it for tense, regardless of whether they are immediately adjacent to it.

the marked clause and the controlling clause, i.e. whether the eventualities they describe occur simultaneously or sequentially. The schematic representation in (7) of the verbs from example (5) illustrates the Amele clause-chaining construction, showing the two types of dependency relation. The arrows along the top of the diagram represent the fact that medial verbs are dependent upon the final verb for temporal reference, and the arrows along the bottom of the diagram represent the fact that the switch-reference marker on each medial clause constrains the reference of the subject of the immediately following clause, whether it is medial or final.



Here, with the exception of the first verb, each verb (medial or final) is dependent on the previous one for information about the anaphoric relation between their subjects and the temporal relation between their eventualities. So, the second medial verb MV₂ has a different subject from MV₁, MV₃ has a different subject from MV₂, and FV has a different subject from MV₃. Similarly, MV₁ is marked as simultaneous with MV₂, and MV₂ and MV₃ are each marked for sequential action, indicating that second, third and fourth events occurred consecutively. In addition, each medial verb is dependent on the final verb of the sentence for its tense. The tense of the whole chain is Yesterday Past, because this is the marking on the final verb. Thus the medial verbs are indirectly anchored to the time of speech through their dependence on the final verb, which is a result of being marked for switch-reference at all, and are temporally ordered with respect to each other through the particular type of switch-reference marking they receive.

Examples (8a,b) illustrate the dependence of medial verbs on final verbs for tense.

- (8) a. Ho busale-ce-b dana age qo-ig-a.
pig run_out-DS-3s man 3p hit-3p-TodP

The pig ran out and the men killed it.

- b. Ho busale-ce-b dana age qo-qag-an.
 pig run_out-DS-3s man 3p hit-3p-Fut

The pig will run out and the men will kill it. [1988: 52, (10)]

The medial clauses in these sentences are identical, yet they receive different interpretations. In (8a), the final verb is in the Today Past tense, and so the event described by the medial verb *busaleceb* is also interpreted as Today Past; in (8b) the final verb is in the Future tense and the event described by the medial verb is interpreted as being in the Future.

We handle the semantic representation of these temporal relations using the mechanisms introduced in the event theoretical versions of DR Theory described in chapter 4, which include UCG. Basically, each medial verb introduces an eventuality index for the clause it heads and one for the following clause, and specifies a linear ordering relation of temporal precedence or overlap between the two. The final verb introduces an eventuality for the clause it heads and specifies a linear ordering relation between it and the time of utterance. Although only the final verb is marked for tense, since each eventuality in the chain is related to the subsequent one, the temporal reference of the chain is eventually 'cashed out' at the time of utterance. The semantic conditions which would describe the chain of eventualities introduced in (5) (repeated below) would be as in (5').

- (5)
- | | | | | | |
|----------------|----------------|------------------|---------|-----------------|-----|
| ija | Malolo | uqa | na | ka | |
| 1s | Malolo | 3s | of_POSS | car | |
| | | | | | |
| jic | ana-g | | na | ono | nu |
| road | mother-3s_POSS | | at | there | for |
| | | | | | |
| sum-ud-i | | bi-biligin | | ne-ce-b | |
| wait-3s-PRED | | SIM-be-DUR_1s_DS | | come_down-DS-3s | |
| | | | | | |
| tobo-co-min | | belo-w-an | | | |
| climb_up-DS-1s | | go-1d-YestP | | | |

While I waited for Malolo's car there at the main road, he came down,
 I climbed in, we two went off. [101, (Text 7); 238, (396); 297, (583)]

- (5') $e_1 \text{ O } e_2 \ \& \ e_2 < e_3 \ \& \ e_3 < e_4 \ \& \ e_4 < \text{now}$

Since medial verbs are dependent upon the final verb for all information encoded in finite verb inflections, which medial verbs lack, they are also dependent upon the final clause for polarity marking and for the marking of the imperative mood and for habitual aspect. Medial clauses are also dependent on final clauses for other moods which are marked not on the verb but by sentential particles, but which are constrained to occur with finite verbs, eg. the (yes/no) interrogative; see Roberts (1987:112,237). This will be discussed in more detail in 5.3.2. For example, (9) shows that it is not possible to specify the mood of a medial clause independently from that of its final clause.

- (9) a. Ho busale-ce-b dana age qo-ig-a fo?
 pig run_out-DS-3s man 3p hit-3p-TodP Q

Did the pig run out and did the men kill it?

- b. *Ho busale-ce-b fo dana age qo-ig-a.
 pig run_out-DS-3s Q men 3p hit-3p-TodP [1988:52, (13)]

Switch-reference and subordinate clauses?

Although switch-reference in Amele is in general restricted in its domain to the clause chaining construction, Roberts notes that it is also marked on two types of subordinate adverbial clause construction: the conditional construction and the certain-apprehensive construction. Examples of the conditional construction are given in (10) and examples of the apprehensive construction are given in (11).

- (10) a. Ija wa na no-co-min fi waga q-it-igi-an.
 1s water in go_down-DS-1s if crocodile hit-1s-3s-Fut
 If I go down into the water the crocodile will get me.
- b. Waga q-it-igi-an ija wa na no-co-min fi.
 crocodile hit-1s-3s-Fut 1s water in go_down-DS-1s if
 The crocodile will get me if I go down into the water. [1988: 58-9, (44)]
- (11) a. Ija wa na no-co-min
 1s water in go_down-DS-1s
 waga q-it-ec/q-it-i-aun
 crocodile hit-1s-INF/hit-3s-NegF
 If I go down into the river the crocodile might get me.
- b. Waga q-it-ec/q-it-i-aun dain ija
 crocodile hit-1s-INF/hit-3s-NegF lest
 wa na
 1s water
 The crocodile might get me if I go down into the water. [1988: 59, (45)]

In conditional constructions, it is the conditional clause which may be marked for (sequential) switch-reference. The conditional mood particle *fi* occupies clause-final position unless the verb is SS sequential, in which case the conditional particle replaces the SS marker. Conditional constructions are normally left-branching, but the marked conditional clause may be extraposed to the end of the sentence as in (10b). The controlling consequent clause has a normal independent, finite verb. This construction may occur without switch-reference, and in this case the verb of the conditional clause is not a medial verb, but an independent, finite verb.

In the certain-apprehensive construction, it is the consequent clause which is marked for switch-reference. The certain-apprehensive clause is marked with the apprehensive mood particle *dain* which occupies clause-final position, and its verb may be either in the infinitival form, with the suffix *-ec*, and no subject agreement or tense, or a finite verb form with either future or negative future tense, in which case the particle is optional. The certain-apprehensive construction is normally right-branching, but the controlling, apprehensive clause may be extraposed to the front of the sentence as in (11b). Note that the extraposed versions of both constructions result in the marked order of controlling

followed by switch-reference marked clause. Once again, another version of the construction occurs, without switch-reference marking; in this case the verb of the consequent clause is not medial but is a finite verb with negative future tense.

Since the presence of a clause-final subordinating particle and the ability to be extraposed are criterial for subordinate clauses in Amele, Roberts (1988: 46) proposes an analysis on which it is the antecedent conditional clause, marked for switch-reference, which is subordinate in the conditional construction, but the consequent apprehensive clause, the controlling clause, which is subordinate in the apprehensive construction. This is further supported by the fact that the apprehensive clause may have an infinitival verb, normally restricted to subordinate clauses. If this is the correct analysis, it represents a counter-example to the proposed universal constraint mentioned in chapter 1, that the switch-reference relation never holds between a superordinate marked clause and a subordinate controlling clause. It is also, as Roberts (1988: 59) points out, a further problem for a configurationally based syntactic binding account of switch-reference such as Finer's.

It is possible that subordinate clauses with the purpose/cause subordinator *nu* also take switch-reference. Roberts does not mention these explicitly as being a possible domain for switch-reference - on the contrary, in both Roberts (1987:121) and Roberts (1988:58) he explicitly says that only two types of subordinate clause can take switch-reference - but examples occur in the texts he gives, such as the following. This case is like the conditional construction in that switch-reference is marked on what is apparently the subordinate clause.⁷

- (12)
- | | | | |
|-----|------|--------------|-------|
| ija | ja | hudo-co-min | nu |
| 1s | fire | open-DS-1s | cause |
| uqa | sab | mane-i-a | |
| 3s | food | cook-3s-TodP | |

Because I lit the fire she cooked the food. [98, (481)]

So in total, switch-reference is marked on the following range of clause types in Amele:

- (i) medial clauses in clause-chaining constructions
- (ii) subordinate adverbial clauses

⁷ There is also a tenuous historical connection between switch-reference marking and the contrafactual and prescriptive mood constructions, which take special subject agreement markers that seem to be related to the subject agreement which helps mark simultaneous-irrealis and sequential DS; Roberts (1987:270-1).

- conditional clauses
- antecedent clauses in a certain-apprehension construction
- ? purpose/cause clauses

In all cases, the switch-reference marked verb is a non-finite medial verb. These are the only constructions in which such verbs appear. All the subordinate adverbial clauses in which such verbs may occur also appear in other varieties in which some other verb form is used.

The semantic relation between the switch-reference marked and controlling clauses in the three subordinate constructions is the same as that which holds between marked and controlling clauses in clause chains, with the additional specification of a causal or logical relation between the two eventualities due to the meaning of the subordinating particle. It should therefore be possible to give a coherent account of the semantics of the switch-reference markers which will generalise across all these cases. I shall present such an account below.

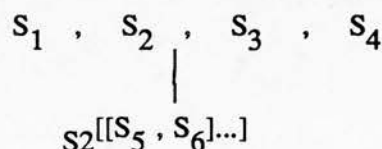
Generalising the syntactic account of switch-reference marking across all three types of clause is a more difficult task. My general assumption is that use of the medial verb form assimilates these constructions to the clause chain construction, and so the treatment of medial verbs in conditional and certain-apprehensive clauses is to be assimilated to the treatment of medial verbs in clause chaining constructions. That is, I hypothesise that the medial verb makes the construction no longer subordinate (this seems to be implied by Roberts 1987: 269 too). The fact that the conditional and apprehensive particles remain has the effect of placing additional restrictions upon both the semantics and the syntax of what is basically a clause chain construction. This idea is easy enough to put into practice for the conditional (and possibly for purpose/cause) clauses, but the analysis of the certain-apprehensive construction remains rather mysterious and I shall leave it for future work.⁸

⁸ It is perhaps significant that most adverbial clauses apart from those which have the potential for switch-reference marking are really relative clauses on head nouns of place, time etc.

'Clause-skipping' in Amele

Switch-reference marking may relate clauses which are chained or in a conditional or certain-apprehensive construction, but which are also both subordinate to some other clause. However, with the two possible exceptions noted in the preceding discussion, switch-reference marking never holds between a subordinate clause and its matrix clause. Switch-reference marking operates only over clauses at the same level of syntactic structure, so that if a subordinate clause occurs within a chain, the switch-reference marking will appear to skip over it and reference the next clause on the same grammatical level instead.

The following diagram illustrates the possibilities. S_1 , S_2 , S_3 , and S_4 constitute a clause chain. S_5 and S_6 are subordinate clauses embedded within S_2 . S_1 may be switch-reference marked vis-a-vis S_2 , S_2 vis-a-vis S_3 , and S_3 vis-a-vis the final clause S_4 . Likewise, S_5 may bear switch-reference marking vis-a-vis S_6 , as both are part of a subordinate structure. But there is no possibility of S_1 marking switch-reference with respect to S_5 , or S_6 with respect to S_2 .



For example, see (13).

- (13)
- | | | | | |
|----------|--------|-----------------|--------------------|-------------|
| Aluh | gemo | na | b-i-me-b | [cudun |
| mountain | middle | to | come_up-PRED-SS-1p | [place |
| oso | jain | mud-i-me-ig | meci-egi-na | eu |
| INDEF | rest | make-PRED-SS-3p | look-3p-Pres | that |
| na] | ono | ege | jain | mi-mi |
| at] | there | 1p | rest | SIM-put |
| | | | | be-1p_SS |
| ege | ege | na | cahineg | sab |
| 1p | 1p | of | day | food |
| | | | | j-om |
| | | | | eat-1p_RemP |

We came up to the middle of the mountain and at the place where they stop to rest and enjoy the view there we rested while we ate our lunch.
[44, (160); 57, (215)]

In this sentence, the section from *cudun* to *na* inclusive is a subordinate adverbial clause of

place, which strictly speaking is a relative clause modifying the NP *cudun oso*, 'a place'. The *eu na* marks the clause as a place adverbial. This subordinate clause itself contains two clauses in a clause chain, which are linked by switch-reference marking; but the switch-reference marking at the subordinate level and at the top level of the sentence are completely separate, as is indicated by the otherwise anomalous SS marking on the first verb *bimeb* 'we come up'.⁹

This property of the scope of switch-reference marking seems to reflect a feeling that there is more cohesion between clauses in a clause chain than there is between a matrix and subordinate clause. One way to express this difference in degree of cohesion would be to say that all the clauses in a chain are at the same level of 'grounding' in terms of Hopper & Thompson (1980:280; see also Grimes 1975), whereas matrix and subordinated clauses differ in their grounding, the former being foregrounded and the latter backgrounded.

The syntactic analysis of medial clauses

In addition to the clause chaining construction and a range of subordinate clause constructions, Amele has clauses which are overtly coordinated in a familiar way, by means of conjunctions such as *qa*, 'but'. See example (14).¹⁰ Independent clauses with finite verbs may also be conjoined in a coordinate relationship by simple juxtaposition, as in example (15).¹¹

- (14) *ija* *ja* *hud-ig-a* *qa*
 1s fire open-1s-TodP but
 uqa *sab* *mane-i-a*
 3s food cook-3s-TodP
 I lit the fire but she cooked the food. [99, (483)]
- (15) *ho* *eu* *tuge-si-n* *cile-si-n*
 pig that butcher-3d-RemP boil-3d-RemP
 They (2) butchered that pig and cooked it. [103, (491)]

The question has arisen in the literature as to whether clause chaining is a type of coordination or a type of subordination. I shall argue that, in so far as one can make such claims independent of the syntactic analysis of particular languages, it is something distinct from either.

This question has some importance for deciding on what syntactic analysis to give for the relation between switch-reference marked and controlling clauses. However, it has been considered a non-trivial decision in the literature chiefly because syntactic binding accounts such as *Finer's* crucially require switch-reference to hold between subordinate constructions and not between coordinate ones. Hence, the line of argument which has been pursued by

between coordinated clauses so that Finer's analysis is inadequate. I have already noted in chapter 1 that switch-reference is said by Jacobsen (1983), Austin (1980), Gordon (1983) and others to hold between uncontroversially coordinated and paratactic constructions, as well as in clause chains, and I have given several other reasons for looking for a more comprehensive account than Finer's. Before giving an analysis for medial clauses, however, I shall briefly review the main arguments for seeing clause chaining as subordination or coordination.

Clause chaining constructions in Papua New Guinea languages have most usually been likened to or collapsed under coordination (see Haiman 1980, 1983, Olson 1981, Comrie 1983, Franklin 1983, Reesink 1983, MacDonald 1983). Most such claims have been based on two types of evidence. The first is the way such clauses are translated into a language like English, which makes an overt distinction between coordinate and subordinate clauses, so that clause chains are claimed to be functional equivalents of coordinate structures in English (Comrie 1983: 19). The second is the fact that medial clauses are dependent on a final clause for tense, etc. in a way said to resemble coordinate reduction (Haiman 1980, MacDonald 1983). As Roberts (1988: 51) shows, these are not particularly effective arguments. Nevertheless, he too claims that clause chains are an instance of coordination. The syntactic evidence he gives for this claim is summarised below (see Roberts 1988: 50-58; also 1987: 43ff., 100f., 292). This evidence is based on rather specific facts about the grammar of Amele and should probably be generalised to other languages only with care.

(i) Medial clauses lack subordinate clause functions. Subordinate clauses in Amele are basically nominal, relative or adverbial; if anything, one could at a pinch see the medial clauses as being adverbial, although Roberts (1988: 54-5) claims that this works much better for sequential medial clauses than for simultaneous ones.

(ii) Since Amele has relatively free word order with respect to adverbial elements, it is possible for subordinate adverbial clauses to occur 'embedded' in their matrix clause in patterns like the following:

AdvP S V
S AdvP V (the preferred version)

Neither medial clauses nor overtly coordinate clauses can be embedded within another clause in this way.

(iii) Subordinate clauses can be extraposed, normally to the end of the sentence, but medial clauses are like coordinate clauses in that their order is sequentially fixed and must normally correspond to the order in which the events being narrated occurred. Switch-reference marked conditional and certain-apprehensive clauses can however be extraposed.

(iv) Cataphoric relations are possible between a pronoun in an initial subordinate clause and an NP in the following matrix clause, but are not possible between medial clauses, or between medial and final clauses. Nor are such relations possible between overtly coordinated clauses.

(v) Combinations of coordinate conjunctions are highly restricted in Amele. Particularly restricted are combinations involving *qa*, 'but'. However, coordinating and subordinating conjunctions may combine. Switch-reference marking may combine with subordinating conjunctions such as *fi*, 'if' and *dain*, 'lest', which we saw above, but not with coordinating conjunctions such as *qa* or *ca*, 'add' (i.e. 'and'). The sole exception is the disjunction *fo*, 'or'. Roberts says this is a plausible exception if we assume that switch-reference clauses are covertly marked for 'and' as this combination then comes out as the inclusive disjunction 'and/or'.

While this evidence is suggestive, there are significant differences between medial clauses and overtly coordinate clauses, both in Amele and in other clause chaining languages I have looked at. In fact, there is one important respect in which subordinate and coordinate clauses pattern alike, and medial clauses are different. This is the matter of independent tense, aspect, mood and polarity marking: both subordinate and coordinate clauses have independent finite verbs, while medial verbs are nonfinite and dependent (comparative examples for Amele may be found in Roberts 1988: 52, (12), (15)). Thus, unlike coordinate clauses, medial clauses cannot occur independently, because they lack appropriate verb morphology.¹²

The difference between subordinate/coordinate and medial verbs is particularly noticeable in Amele with respect to negation. Negation can be marked by verbal inflection or by the negative particle *qee*, 'not'. In clause-chaining constructions only the final verb is marked for negation, with the scope of negation being determined by the position of the negative particle. See examples (16a) and (b): in each, everything between *qee* and the final verb is within the scope of negation. However, subordinate clauses can be negated independently from their matrix clauses, and vice versa, with the scope of negation limited to the syntactic level at which it occurs, and similarly for coordinate clauses.

⁹ Note that the sequence *jain mimi bileb* is a compound verb meaning to 'make rest'.

¹⁰ There are three other coordinating conjunctions; *ca*, 'add', and *fo*, 'or'. All four have very restricted distribution: eg. *qa* can connect only two clauses at a time, and *ca* can link only nominalised/adjectivalised clauses. See Roberts (1987: 98ff., 324).

- (16) a. Uqa jo l-i-me-i sign qee o-l
 3s house go-PRED-SS-3s knife NEG get-3s_NegP

He went to the house and didn't get the knife.

- b. Uqa jo qee l-i-me-i sign o-l

He didn't go to the house and get the knife. [112, (530), (531)]

Because of this, I would wish to keep a clear distinction between the medial verbs of clause chaining constructions and independent coordinated verbs. The medial verbs seem to fall between subordinate and coordinate verbs in the degree of dependence which they exhibit, and while it is obviously important to recognise that clause-chaining constructions are often dissimilar to subordination in the language in question in various ways, it does not seem important to find some foolproof way to assimilate them to coordinate constructions: since they share properties of both kinds of construction, we could assimilate them to one or the other perhaps depending upon the particular language.¹³ Equally, we could recognise that they are just a separate category of interclausal relation. As Longacre (1985) has argued, it may be that in clause-chaining languages we have to assume that the notions of subordination and coordination are suspended in a clause chaining structure.

How, then, is the syntactic relationship between switch-reference marked clauses best represented in a categorial grammar such as that incorporated in UCG?

We will treat a switch-reference marked (i.e., medial) clause as having the category S/S. On this account, the syntactic analysis for sentence (17) is as in (18).¹⁴

¹¹ Amele also has serial verb constructions of various kinds (see Roberts 1987:309ff.) Serial verb constructions (Foley & Van Valin 1984: 189-93 & s5.2, Foley & Olson 1985, Comrie 1985) have been defined as constructions in which a small number of verbs with some coreferential core arguments (usually subjects) are juxtaposed, share a single verbal inflection, and receive an interpretation which is in some sense a function of the meanings they have individually. I shall have nothing further to say about them here, but note the following problem which arises in giving an account of serial verbs in switch-reference marking languages. In Amele, as we have seen, verbs with SS marking may occur in a stripped down form in which the switch-reference marker is deleted. When series of stripped down verbs occur, it is therefore hard to tell whether we are dealing with a verb in a serial verb construction or a stripped down SS verb in a switch-reference relation. Compare Roberts (1987: 236, 273, 314).

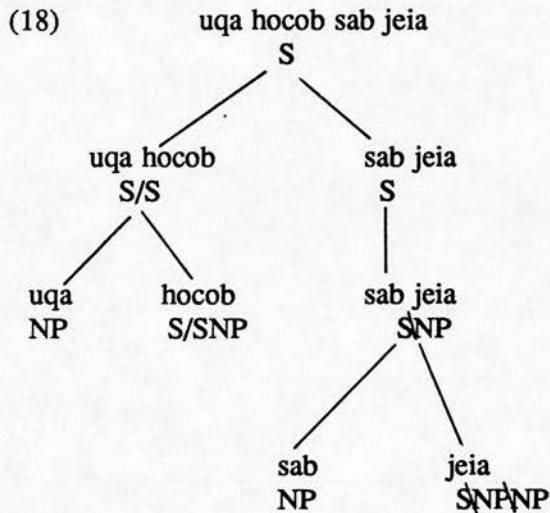
¹² Roberts himself states that this makes medial clauses look more like subordinate clauses than coordinate clauses, in his evaluation of Haiman's coordinate reduction argument.

¹³ For example, apparently in Japanese, medial verbs in clause chaining constructions have the same form as the verbs in complementation structures (p.c. Pete Whitelock).

¹⁴ This example is exactly like (4) above except that third person subjects occur in both clauses; this highlights the way the account distinguishes the referents of two formally identical NPs.

- (17) uqa ho-co-b sab je-i-a
 3s come-DS-3s food eat-3s-TodP

He_i came and he_j ate the food.



The move from the category *SNP* to the category *S* for the clause *sab jeia* is allowed in Amele because of its head marking and null anaphora properties. We allow for this in the grammar by an optional unary rule which maps *SNP* into *S*; although this may not be regarded as a particularly satisfying solution in a theory of null anaphora, it serves our rather different purpose here.

Because long chains of medial clauses are possible, we have to allow the active *S* edge of the medial clause category *S/S* to be satisfied by both a final clause with category *S* and another medial clause, also with category *S/S*: this is possible if we allow function composition of the following kind:

$$X/Y + Y/Z \Rightarrow X/Z$$

It is also necessary to prevent the category *S/S* from unifying with a following subordinate clause, since apart from giving the wrong results in terms of constituent structure, this would make the wrong predictions about the use of *SS* and *DS* markers, which as we saw only operate across the same syntactic level. To do this we introduce the feature *VFORM* with values {subordinate, root}. This feature is defined for all verb forms and is inherited by the clause of which the verb is head; see 5.3.2. Assignment of values for this feature is determined by the verb form, and possibly also by the presence of particular subordinating particles in clause-final position. We then constrain the category of the switch-reference

marked clause to be:

$$S \left[\begin{smallmatrix} \text{VFORM} \\ \text{root} \end{smallmatrix} \right] / S \left[\begin{smallmatrix} \text{VFORM} \\ \text{root} \end{smallmatrix} \right]$$

As we saw in chapter 4, the subscripted $\left[\begin{smallmatrix} \text{VFORM} \\ \text{root} \end{smallmatrix} \right]$ on each feature structure indicates that the two categories must agree in all feature values, so that the S of the active edge must also be $\left[\begin{smallmatrix} \text{VFORM} \\ \text{root} \end{smallmatrix} \right]$.¹⁵

The fact that the active and result S signs agree in their feature structures allows us to account for the way the medial clauses inherit the tense, polarity, mood and aspect marked on the finite clause. This will be discussed further in section 5.3.2.¹⁶

The category S/S is the kind of category which would normally be given to sentential modifiers, including sentential adverbs and adverbial clauses in a language such as English. I have said that in Amele, most other 'adverbial' clauses are actually relative clauses. There is in any case scope for distinguishing between medial clauses and other adverbial expressions, both in the feature structures associated with the categories and in the semantics given to the switch-reference markers. That is, the analysis does not mean that medial verbs are taken to have other properties of adverbial clauses in Amele, such as freedom of position in the clause. The motivation for this kind of analysis for medial clauses is that it accounts for their dependency on a final finite clause. The additional hierarchical structure introduced into the analysis does not seem to present any particular problems. Furthermore, we do not, by adopting this proposal, fall into the same trap that Finer does, because we will not use a configurational account of binding to handle the referential dependency relation.

5.3.2. Lexical classification of Amele verbs

In this section I will present those elements of an account for Amele verbs in the lexical component of Unification Categorical Grammar which are relevant to capturing the switch-

¹⁵ This account works for conditional clauses with medial verbs, as we assume that they are $\left[\begin{smallmatrix} \text{VFORM} \\ \text{root} \end{smallmatrix} \right]$ due to the presence of the medial verb. It will be necessary to impose an additional locality constraint on them, due to the conditional particle, such that they must combine with a finite clause and may not combine with a following medial verb. The account would not work for apprehension clauses, however, on the analysis, if correct, where the controlling clause is subordinate. I have no solution to this problem at present.

¹⁶ There is no space here to give a full account for the scope of negation.

reference relation.

Amele verb forms fall into three classes distinguished according to their morphological inflection: finite verbs, medial (non-finite) verbs and infinitival (non-finite) verbs.¹⁷ We have seen examples of all three kinds. Here we shall be concerned just with the medial and finite verb forms. The structure of medial verbs (MV's) is diagrammed in (19) and the structure of finite verbs (FV's) is diagrammed in (20). Bracketted elements indicate those whose occurrence is dependent upon the subcategorisation characteristics of the verb. All verbal inflection is optional in context, as noted above.

(19) MV: stem + (obj. agr.) + (obj. agr.) + predicate marker + SR + subj. agr.

(20) FV: stem + (obj. agr.) + (obj. agr.) + predicate marker + subj. agr. +

tense/aspect/mood/polarity.

There are two differences between these verb forms. The medial verb but not the finite verb takes switch-reference marking, and conversely the finite verb but not the medial verb is inflected for tense, and optionally for habitual aspect, imperative mood and negation.¹⁸

In each case, optional object markers may occur agreeing in person and number with a direct or indirect animate object or both. The pronominal clitics which are the object markers are almost identical for direct object and indirect object, as the table in (21) shows. The main function of the predicate marker *-i-* appears to be to distinguish the direct from the indirect object marker: the direct object clitic, if present, attaches directly to the verb stem, and the predicate marker either follows it or is omitted; the indirect object marker always follows the predicate marker, so it either attaches to the verb stem plus predicate marker, or to the verb stem plus direct object plus predicate marker. However, the predicate marker may also occur when object agreement is not present.

¹⁷ Roberts (1987: 272, 324) distinguishes the 'infinitive' form, which is the citation form and occurs in various mood constructions, from the 'nominalised/adjectivalised' form; but both have the ending *-ec/-(d)oc*.

¹⁸ In addition, there are certain moods which are restricted to finite clauses but not morphologically marked on the verb; medial verbs inherit these too. Sequential medial verbs may themselves be marked for iterative aspect; both the simultaneous switch-reference markers and iterative aspect are indicated by reduplication, but apparently there are differences between them (Roberts 1987: 252).

(21) Object Agreement Suffixes

	DO	IO
1s	-it	-it
2s	-ih	-ih
3s	-ud	-ut
1d	-il	-il
2/3d	-al	-al
1p	-ig	-ig
2/3p	-ad	-ad

Subject agreement is obligatory in finite verbs, and in DS-marked medial verbs, and optional in SS-marked medial verbs if they are sequential or if they are simultaneous and the following verb has durative aspect. In finite verbs, the order of subject agreement and the tense/aspect/mood/polarity desinence depends on the tense/aspect/mood/polarity in question, and will not be detailed here (see Roberts 1987:278). Nor will the morphology of finite inflection for tense/aspect/mood/polarity be given (Roberts 1987: 223ff.)

The morphology of the switch-reference system is quite complex, and is summarised in the diagram in (22). Switch-reference marking interacts with the class of subject agreement marker which is chosen; there are eight such classes of which the three below co-occur with switch-reference marking and are not used in any other contexts.¹⁹

¹⁹ The numbering of the classes as I, II and III is for convenience, and does not correspond to the numbers these classes are given as part of a set of eight by Roberts (1987:277-8): classes 1, 6 and 2.

SUBJECT AGREEMENT

SS:	{	seq. = -me	}	+	{	1	SG	DU	PL	}	I
							-ig	-u/Ø	-b		
							-g	-si	-ig		
	{	sim. = redup.	}		{	2	-i	-si	-ig	}	
DS:	{	seq. = -cV	}	+	{	1	-min	-hul	-mun	}	II
							-m	-bil	-bil		
							-b	-bil	-bil		
	{	sim. ir. = redup.	}	+	{	2	-igin	-wan	-gon	}	III
							-gan	-sin	-gin		
							-n	-sin	-gin		

Sequential switch-reference marking is straightforward: the SS marker is *-me* and the DS marker is *-cV*, where V is an epenthetic harmonic vowel. The SS-marker is optionally followed by a subject agreement marker taken from class I, and the DS marker is obligatorily followed by a subject agreement marker taken from class II. In a sense the sequential aspect is the unmarked case.

Simultaneous switch-reference marking is somewhat more complicated. SS marking is by reduplication of the verb stem (or occasionally the subject marker or object marker) and by choice of subject marker from class I. Simultaneous DS marking distinguishes between realis and irrealis mood - completely dependent upon the tense and mood of the final verb, as we shall see below. Both are marked by reduplication of the verb stem (or occasionally the subject marker or object marker), but they choose subject markers from different classes: II and III respectively. So in the simultaneous case, there is no isolable SR morpheme. Whether it is the verb stem which is reduplicated, or the subject marker, or the object marker, depends on the class of the verb (Roberts 1987: 242ff.). See examples (23a,b), where (a) is realis and (b) is irrealis.²⁰

- (23) a. Ho bu-busal-en dana age qo-in.
pig SIM-run_out-3s-DS man 3p hit-3p-RemP

²⁰ Roberts (1987:237) shows that it is not possible to further analyse the switch-reference morphology, eg. he rejects an analysis of the morphology of medial verbs on which switch-reference is indicated by the subject agreement paradigm used, and the markers and reduplication indicate the temporal relation between events.

As the pig ran out the men killed it.

- b. Ho bu-busal-eb dana age qo-u-b.
 pig SIM-run_out-3s-DS man 3p hit-CONTR-3p

The men would have killed the pig as it ran out.

The following set of features, with the feature values listed, is required. One of these is the feature VFORM which was introduced in 5.2.1. Abbreviations are indicated.²¹

VFORM	{subordinate, root}
TENSE	{tod_p, yest_p, rem_p, pres, fut, rel_f}
MOOD	{ind(icative), imp(erative), cond(itional), pres(criptive), contr(afactual)}
POLARITY	{pos, neg}
ASPECT	{hab(itual), it(erati)v(e)}
STATUS	{realis, irrealis}
SWITCH-REFERENCE	TEMPORAL RELATION {seq, sim}
	PARAMETER AGREEMENT {SS, DS}

Finite verbs are defined for all features except SWITCH-REFERENCE. Medial verbs are defined for the features SWITCH-REFERENCE and STATUS. The feature SWITCH-REFERENCE takes complex values; i.e. the features TEMPORAL RELATION and PARAMETER AGREEMENT, which have the values listed.

I make a distinction between MOOD and STATUS, although the two are related.²² I take MOOD to encode the range of specific grammatical distinctions in modality which are realised morphologically on finite verbs (or by sentential particles in finite clauses). I take STATUS to encode the distinction between realis and irrealis verbs and clauses which partially corresponds semantically to a distinction between actual and non-actual eventualities. This distinction is motivated by the fact that as shown in table (22) above, simultaneous DS markers have distinct realis and irrealis forms, with the choice between the two dependent upon the tense and mood of the final verb in the clause chain.

²¹ To avoid undue complexity, just those feature values marked by verbal inflection are given here. We will also need to account for types of mood, aspect etc. encoded in independent constituents; these feature values will be inherited by the medial clause in exactly the same way as those listed. Note that some portmanteau morphs occur; I will leave their realisation as a problem for the realisation rules. They are: Remote Past (tense and subject agreement), Negative Past and Negative Future (tense, subject agreement and polarity), Habitual Past (tense and aspect). As we saw above, there are also interactions between switch-reference marking and subject agreement. There are also feature cooccurrence restrictions which will not be specified here, for example that contrafactual and prescriptive moods only occur with the Negative Future tense.

²² A similar distinction is made by Foley & Van Valin (1984: 213).

The feature STATUS is defined for both medial and finite verbs. For medial verbs, assignment of a particular value may be due to the form of the DS marker for which the verb is inflected, or due to unification with a final finite verb, upon which the value for the STATUS feature will be shared. For finite verbs, the value for STATUS will be determined via the feature cooccurrence restriction specified as the following biconditional.

$$[\text{STATUS: realis}] \Leftrightarrow \neg [\text{TENSE: future}] \ \& \ [\text{MOOD: prescriptive}]^{23}$$

This rule should be read as meaning that the feature STATUS, if defined, is realis if and only if the feature TENSE, if defined, is not future, and the feature MOOD, if defined, is prescriptive. The rule encodes the information that irrealis status cooccurs with future tense and indicative, imperative, conditional and contrafactual moods; while realis status cooccurs with non-future tenses and prescriptive mood.²⁴

Due to the operation of unification, clauses automatically inherit the features of their verbs, with no need for any additional mechanism of feature percolation. The syntactic type of the clause (i.e. its potential for interclausal relation) is determined by morphological characteristics of the verb. This has two important effects. First, as we saw in 5.3.1, if a verb is specified as [VFORM root], then so is the clause of which it is head. Second, this is the way in which the TENSE, ASPECT, MOOD, POLARITY and STATUS features of the finite verb may end up as features of the whole clause chain.

NPs are specified for the following features (abbreviations as in glosses):

PERSON	{1,2,3}
NUMBER	{s,d,p}
AGENTIVE	{+ag,-ag}

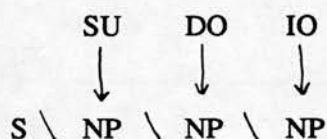
For example, the sign for a NP *caja*, 'the woman', would be:

²³ For any feature F with values $\{v_1, \dots, v_n\}$, $\neg [F: v_i]$ is to be interpreted as stating that the value of the feature is some member of the complement of v_i , or that the feature is undefined. $[F: \neg v_i]$ is to be interpreted as stating that the feature is defined but has some value other than v_i . Recall from chapter 4 that we make an important distinction between a feature being defined but not specified as compared with a feature simply not being defined for some expression. Smolka (1988) defines a feature logic which supports the partial description of linguistic objects using sorts and features as primitives, which is a crucial part of unification-based grammar formalisms. His feature logic grounds many of the operations and relations on feature structures assumed in such grammars. See also Pollard & Sag (1987:chs.2,3) and Shieber (1986:§3.2).

²⁴ This formulation of the rule is based on the statement in Roberts (1988:50); in Roberts (1987: 239, 275) a slightly different generalisation is made; the important point is that future tense is irrealis and non-future tenses are realis.

caja
 NP[3,_,_] ²⁵
 woman'(x₁)

The function of the feature AGENTIVITY will be explained below. Since NPs are not case marked, there is no need for a case or grammatical function feature. Following the general approach taken to grammatical relations in categorial grammar by Klein (ms.) (see also Dowty 1982a, b; Pollard & Sag 1987), we define grammatical relations by referring to the categorial make-up of the verb, and regard the order of NPs subcategorised for via the category of the verb as significant just to the extent that it indicates their obliqueness; thus we define the subject NP as that NP closest to the S, the direct object NP as the next closest, and the indirect object NP as the outermost. Thus:



A way of schematizing the identification of grammatical relations across verbs of varying polyadicity is proposed by Klein (ms.:2), using a notation (due to Ades & Steedman 1982) which allows variables over the initial segments of lists. He uses $Y_1/Y_2/\dots/Y_n\$C$ to represent a valency list whose tail is the list of categories $Y_1/Y_2/\dots/Y_n$, and whose initial segment (possibly empty) is the list C. Using such a notational device, grammatical relations in Amele can be defined in terms of the following verb categories:

- a. subject: $\text{SNP\$C}$
- b. direct object: $\text{SY\$NP\$C}$
- c. indirect object: $\text{SY}_1\backslash\text{Y}_2\backslash\text{NP\$C}$

If necessary, morphosyntactic information can be associated with NPs of a particular grammatical category by features.

Agreement between these NPs and the verb falls out through unification: agreement

²⁵ I adopt the following notational conventions in representing signs. The features for which a particular category is defined are listed after it in square brackets. Only the values are given, not the feature labels. Where it is useful as a mnemonic, features which are defined but unspecified will be represented with the underscore _. Some information will be omitted from the representation of the sign: in particular, the unspecified phonological representations of categories on the active edge, and certain verbal features. Features are listed for NPs in the order [PERSON, NUMBER, AGENTIVE]. The only feature I shall consistently list for S will be VFORM, although other features such as TENSE and STATUS will be listed from time to time where relevant to the discussion; where all three are listed it will be in that order.

markers on the verb place restrictions on the feature structures of the subcategorised for NPs, and only NPs with compatible feature structures can unify with the verb. Note that the flow of information between the verbal category and the NPs which it unifies with is not simply one way, since nonpronominal NPs in Amele are not morphologically marked for number, so that their number may be indicated just by the agreement marker on the verb.

The signs for verb stems, as might be found in the lexicon, are illustrated by the following entry for the verb 'peel'.

met-
 $S[_,_,_]\backslash NP[_,_,+ag]:x_1 \backslash NP[_,_,_]:x_2$
 [a] [peel' (a,x₁,x₂)]

This states that the verb stem has the phonology/orthography *met-*, the syntactic category in line two which is basically $SNP \backslash NP$, i.e. the category for a transitive verb, and the semantics in line three expressed in InL. Notice that the verb *met-* constrains its subject NP to be [AGENTIVE +ag]. At this stage this is the only feature which is specified.

The sign for a finite form of the verb, with tense inflection and subject agreement, would be:

meten
 $S[\text{root,rem_p,realis}]\backslash NP[3,s,+ag]:x_1 \backslash NP[_,_,_]:x_2$
 [e₁] [peel' (e₁,x₁,x₂) & e₁ < now]

The subject marker on the verb has the effect of further constraining the feature structure of the subject NP, and the tense has the effect of further specifying the aspectual sort of the eventuality, and adding a condition situating the time of the event vis-a-vis the time of utterance. Thus, we now know that the eventuality is an event rather than a state, and that its temporal reference is past relative to the time of utterance.²⁶

I said in section 5.3.1 that switch-reference marked clauses have the category S/S. The question of the syntactic relation between marked and controlling clauses ultimately

²⁶ Given the theory we are working with, in general one might expect temporal reference conditions introduced by tenses to be of the form $e R \text{ now}$, where R is a relation of linear precedence or overlap. Since Amele has such a complex tense system, and the details of how it should be accounted for are not relevant here, I shall not distinguish between the different degrees of remoteness of past tenses in the semantic conditions which are introduced.

reduces to the question of what category the switch-reference morpheme has, i.e. what effect does it have on the category of the verb to which it applies? The switch-reference markers are treated as inflections which turn a verb, as head of its clause, into a dependent verb heading a dependent clause: i.e. into something which requires another S in order to yield a complete sentence. Their syntactic category is thus:

$$(S_{\square}[\text{root}]/S_{\square}\backslash NP)/(S[_]\backslash NP)^{27}$$

Finite verbs and medial verbs thus have distinct syntactic categories: $S[\text{root}]\backslash NP$ and $S_{\square}[\text{root}]/S_{\square}\backslash NP$ (for intransitive verbs) respectively.

The categories for the simultaneous DS markers will be further specified with a feature value for STATUS, thus:

$$(S_{\square}[\text{root},\text{realis}]/S_{\square}\backslash NP)/(S[_,_]\backslash NP)$$

$$(S_{\square}[\text{root},\text{irrealis}]/S_{\square}\backslash NP)/(S[_,_]\backslash NP)$$

We saw in 5.3.1 that one semantic condition introduced by switch-reference markers is a temporal relation between eventualities, analogous to the temporal relation introduced by tense on the finite verb. We have seen in this section how these temporal conditions are licensed by the feature values specified on categories. We have also seen how feature structures and unification together provide us with a mechanism for handling the dependency of medial verbs on finite verbs. The semantics of the switch-reference markers are dealt with more fully in section 5.4.

5.4. The semantics of switch-reference in Amele

In section 5.3 a syntactic analysis was given for medial verbs and the clauses they head. This analysis allowed us to account for the dependence of medial verbs on a finite verb for tense and other inflectional information. In addition, we indicated the form of that part of

²⁷ This covers intransitive verbs; some provision needs to be made for transitive and ditransitive verbs. The most straightforward way to do this in the grammar formalism being used here is to write separate rules for each of the three kinds; alternatively the '\$' notation introduced above for handling grammatical relations could be used. Other alternatives are offered by HPSG type grammar formalisms such as that described in Pollard & Sag (1987), where instead of the slash category notation, a subcategorisation list is used.

the semantic analysis of medial clauses which will deal with the temporal relation of sequentiality or simultaneity specified by the switch-reference marker.

It remains in this section to show how we account for the other element of meaning contributed by switch-reference marking: the specification of a relation between the two clauses which as we saw in chapter 2 is normally a matter of whether the switch-reference pivots are coreferential or not, but may also involve nonreferential meaning.

In section 5.3.1, we gave a syntactic representation for the example sentence (17) (repeated below). In (24) below, we give a standard DR Theory representation of the kind we would want for the semantics of this sentence.

- (17) uqa ho-co-b sab je-i-a
 3s come-DS-3s food eat-3s-TodP

He_i came and he_j ate the food.

- (24)
- | |
|---|
| e_1 e_2 now x_1 x_2 x_3

$\text{come}(e_1, x_1)$
$x_1 = y$
$e_1 < e_2$
$x_1 \neq x_3$

$\text{food}(x_2)$
$\text{eat}(e_2, x_3, x_2)$
$e_2 < \text{now}$ |
|---|

The discourse marker y is assumed to have been introduced in some prior Discourse Representation Structure. The effect of the DS marker is encoded in the anaphoric condition $x_1 \neq x_3$, which constrains the reference of the two switch-reference pivots to be disjoint. Notice how the temporal relations between the events are encoded in the way foreshadowed in 5.3.1: the eventuality introduced by the dependent clause, e_1 , is not temporally located relative to the speech point *now*, but is located relative to the 'reference point' provided by the event time of the independent clause, e_2 ; since e_2 is then located

relative to *now*, then indirectly so is e_1 .

Although it is relatively straightforward to specify the kind of semantics we want for this sentence in DR Theory, a number of interesting problems remain, chief among them the question of whether it is possible to express the effect of switch-reference marked clauses in a largely compositional manner.

Within the grammatical framework of UCG, we assume that at the level of semantic representation, verbs introduce an eventuality marker which usually percolates up to the semantics of the sentence which the verb heads. Thus, the switch-reference marked clause will combine with a sentence whose interpretation is of the form:

(i) $[a_2]A$

(where the DM sort a is used because the eventuality is as yet unspecified aspectually, and could be an event or a state).

This combination will yield a new interpretation, for the whole sentence, of the form:

(ii) $[e_1] [\text{come}'(e_1, x_1)] \ \& \ e_1 < a_2 \ \& \ x_1 \neq \text{subject}([a_2]A) \ \& \ [a_2]A$

Apart from any information contributed by the switch-reference marker, the marked clause itself is responsible for the introduction of the discourse markers e_1 and x_1 , and the condition $\text{come}'(e_1, x_1)$. In addition, this representation encodes the conditions introduced by the switch-reference marker, $e_1 < a_2$ and $x_1 \neq \text{subject}([a_2]A)$, and the interpretation of the controlling clause as given in (i).

If we assume that (i) will turn out to be something like:

(iii) $[e_2] [\text{food}'(x_2) \ \& \ \text{eat}'(e_2, x_3, x_2) \ \& \ e_2 < \text{now}]$

then we end up with a representation equivalent to the DRS in (24) above. That is, as well as the discourse markers and conditions introduced by the marked clause, the discourse markers e_2 , x_2 , x_3 and *now* are in the universe of the DRS, and the conditions $\text{food}'(x_2)$ (' x_2 is food') and $\text{eat}'(e_2, x_3, x_2)$ (' e_2 is an event in which x_3 eats x_2 ') and $e_2 < \text{now}$ (' e_2 happened in the past') are introduced into the body of the DRS.

The main problem is to ensure that we pick out x_3 as the subject of the *eat* proposition. At the stage at which the conditions in (ii) are introduced, i.e. upon interpretation of the switch-reference marked clause, information about the number of arguments in the following clause is not available, making the relation between switch-reference pivots difficult to state formally: above we used the undefined function 'subject' to indicate the desired effect, but a principled account of how the switch-reference pivots of the two clauses can be distinguished remains to be given. This is one of the two main issues to be addressed in this section.

The second problem is giving an account for the functional extensions of the switch-reference system in Amele, as described in chapter 2. We saw there that Amele exhibits both types of functional extension we discussed: use of SS marking where there was apparent disjoint reference, and use of DS marking where there was apparent coreference between switch-reference pivots. Accounting for the functional extensions of switch-reference markers will also involve representing information which cannot be fully specified in advance of the interpretation of the following controlling clause.

Both these difficulties will be handled using the notion of the **structured eventuality index** mentioned in the introduction to this chapter. The structured eventuality index, and thus the core of the account, is presented in 5.4.3; first, we briefly review what is involved in distinguishing the switch-reference pivot and in accounting for functional extensions.

5.4.1. Distinguishing the switch-reference pivot

Restricting the switch-reference relation to the switch-reference pivot, usually the subject NP, is going to be a problem for any formal theory. In this section I shall consider how the switch-reference pivot in Amele can be characterised, preparatory to presenting an account of how it will be distinguished formally in 5.4.3.

Roberts says that the switch-reference pivot in Amele is the surface syntactic subject. The definition of 'subject' is itself a notoriously difficult one crosslinguistically (see especially Keenan (1976) and work in Role and Reference Grammar such as Van Valin & Foley (1980), Foley & Van Valin (1977)). Surface syntactic subjects in Amele are identified as having (at least) the morphosyntactic properties listed in (i)-(iv) (Roberts 1987:67f,145ff). Property (iv), here as elsewhere in this thesis, is one which must be discounted in trying to

establish whether it is subjects which are switch-reference pivots.²⁸

- (i) the subject nominal obligatorily triggers subject agreement marking in number and person on the verb, unless the verb is infinitival.
- (ii) subjects 'normally' occur in initial position in the clause, identified as 'subject position'.
- (iii) the subject is that nominal which is 'suppressed' by the pseudo-passive construction (to be described below).
- (iv) subjects trigger switch-reference marking.

Roberts (1987:297ff) shows that the switch-reference system operates in terms of syntactic subject rather than marking changes in semantic role, from agent to patient etc. However, we saw in chapter 2 that as in a number of other switch-reference languages, there are some interactions with agentivity. In brief, SS marking may be used even when there is actual change of reference of the syntactic subject, when the subject of the controlling clause is nonagentive: either the subject of an impersonal verb, an inalienably possessed body part, or an inanimate NP. In other words, changes of subject which are not also changes of agent are ignored by the switch-reference system. A DS marking in such cases produces the reading that some other causal agent is involved which is not the subject (or any other argument) of the controlling clause. Hence, the definition of switch-reference pivot in Amele seems to be rather 'agentive subject'. The reformulated definition of the switch-reference markers which was proposed in chapter 2 was:

SS indicates that there is no new (i.e. disjoint) agentive subject in the controlling clause.

DS indicates that there is a new (i.e. disjoint) agentive subject in the controlling clause.²⁹

We should consider the possibility that the switch-reference pivot in Amele may be defined as the 'topic' rather than the (agentive) syntactic subject of the clause. Roberts

²⁸ As we have seen, there is no case marking on NPs to help identify their grammatical function. Since any NP can be omitted provided it is semantically retrievable, ellipsis provides no good tests for subjecthood. There is no 'true' passive construction involving movement of an initial subject NP.

²⁹ Although Roberts (1987: 292) leaves it as a 'matter for interpretation' whether the switch-reference system should be seen as a syntactic system influenced by semantic factors, or as a semantic system marking just same or different agent, I presented evidence in chapter 2 for choosing the first option: in brief, in a structure MV_1 -SS + MV_2 -DS + FV, MV_2 may be an impersonal clause which does not have an agentive subject, and MV_1 and FV may both have the same agentive subject, but although there has been no change in agent throughout the entire chain, MV_2 will still receive DS marking.

(1987:145ff.) defines the Amele topic as the first element in the clause, and states that syntactic subject and pragmatic topic coincide in all cases except in the case of impersonal constructions and pseudo-passive constructions. The first of these constructions was discussed in chapter 2 and both will be treated in more depth in 5.5. Briefly, in impersonal constructions, the original subject nominal is in initial position in the clause but triggers object agreement rather than subject agreement on the verb, i.e. it remains topic but is no longer subject. In such constructions it is ungrammatical for the other nominal in the clause to appear in first position. In the pseudo-passive construction, the original subject nominal is omitted, and the original object nominal, which remains syntactic object as it triggers object agreement, is in topic position.

However, it is not clear what theoretical status this notion of 'topic' is supposed to have.³⁰ Apart from this, there is no advantage in redefining the switch-reference relation as a relation between topics. Although it would account for some of the cases of otherwise 'unexpected' SS marking with impersonal controlling clauses, there are other examples of the same kind which it cannot account for, such as those involving weather expressions or other inanimate subjects. For example, in *Ija cocobig wa hedoia*, 'As I walked along the rain stopped', there is SS marking but two different topics.

To identify the switch-reference pivot as the agentive subject of the clause, we introduced the NP feature AGENTIVE with values {+ag,-ag}. We also saw in 5.3.2 that the grammatical function of NPs could be defined over their linear position in the syntactic category of the verb, i.e. in terms of their obliqueness as arguments. Further, as Klein (ms.) shows for case in German, NPs of a particular grammatical category can be constrained to have certain morphosyntactic characteristics by features. Thus we can define the switch-reference pivot in Amele as follows:

An expression α is the *switch-reference pivot* of a verb β iff it unifies with the NP[AGENTIVE +ag] slot of β with category SNP[AGENTIVE +ag]SC.

Specification of the anaphoric relation between the switch-reference pivots is a matter for anaphoric conditions of the kind familiar in discourse representation structures, which are introduced by the switch-reference markers: for example, the condition $x_1 \neq x_3$ in DRS

³⁰ That is, it does not appear to be implicated in any grammatical processes, and as Roberts (1987: 146) points out, it doesn't meet Li & Thompson's (1975) criteria for distinguishing topic from subject: the Amele topic need not be definite, need not be first constituent in the clause provided it is first core constituent, and does agree with the verb.

(24). These conditions relate discourse markers which are given a special status in the semantics due to their identification as the referents of the switch-reference pivots. We shall see how they are assigned this special status in 5.4.3.

Finally, the anaphoric relation defined as holding between switch-reference pivots must be able to cope with cases in which at least one of these NPs is dual or plural, and a relation of inclusion or overlap holds between referents of the two NPs, which I shall call their 'pivot sets'.

We saw in chapter 4 that the version of DR Theory we are using handles plurals by introducing plural discourse markers represented by upper case letters $\{X_1, X_2, X_3, \dots, X_n\}$. Anaphoric relations which occur between two plural NPs are handled with the normal anaphoric linkage condition, eg. $X_1 = X_2$. This is taken to mean that the set or group of entities referred to by X_1 is coextensive with that referred to by X_2 . Anaphoric relations between a singular and a plural NP may be handled by an 'element of' anaphoric linkage condition, $x_1 \in X_2$. This is taken to mean that the entity referred to by x_1 is a member of the set or group of entities referred to by X_2 . Other set-theoretic relations may also be used in anaphoric conditions, for example, a 'superset of' condition, $X_1 \supseteq X_2$, would be taken to mean that the set or group referred to by X_2 is a subset of (included in or equal to) the set or group referred to by X_1 .³¹

In chapter 1 I discussed the crosslinguistic possibilities of use of SS and DS marking in circumstances where at least one of the switch-reference pivots was plural, and where there was a subset or intersection relation between the two pivot sets. (25) lists the possible anaphoric relations which may hold between pivots, at least one of which is plural; NP_1 is the pivot of the marked clause and NP_2 is the pivot of the controlling clause. In many languages at least some such cases require or allow SS marking.³²

³¹ Accounting for the reference of plural NPs is a much more difficult problem than this suggests. For example, there is evidence that it is unwise, even if possible, to think of natural language plurality in terms of set-theoretic entities; rather we need a concept like Links' (1983) 'pluralities' or Bealers's (1982) 'aggregates/collections'. These differ from 'sets' in ways which are not important for the present endeavour. Note, though, that it is a significant step we have taken in conceiving of discourse markers as denoting sets rather than individuals, and the use of set-theoretic relations such as 'element of' and 'subset of' in anaphoric linkage conditions between discourse markers, gives rise to non-trivial choices about when the appropriate DM for an expression is to be an individual and when a (possibly singleton) set.

³² This of course makes a definition of the function of the switch-reference markers in terms of coreference seem less plausible. As Finer (1984) and Chomsky (1981:283-7, 1986:207n) note, subset and intersection relations also seriously complicate a coindexing formalism for anaphoric relations such as is adopted by the Binding Theory: in his account of switch-reference, Finer has to propose a system of dual indexing to express set inclusion and intersection.

- (a) NP₁ properly includes NP₂
- (b) NP₂ properly includes NP₁
- (c) NP₁ and NP₂ intersect
- (d) NP₁ and NP₂ are disjoint
- (e) NP₁ and NP₂ are equal

In Amele, as in all switch-reference languages, case (d) always requires DS marking and case (e), SS marking. The Amele examples (26)-(29) illustrate cases (a) and (b).³³

- (26) Ege h-u-me-b sab j-ig-a
1p come-PRED-SS-1p food eat-1s-TodP

We_{i,j,k} came and I_{i} ate the food. (a) [294, (564)]

- (27) Ija ho-co-min sab jo-qa-a
1s come-PRED-DS-1s food eat-1p-TodP

I_{i} came and we_{i,j,k} ate the food. (b) [295, (570)]

- (28) Ele jo na h-u-me-u uqa q-ite-i-a
1d house to come-PRED-SS-1d 3s hit-1s-3s-TodP

We-two_{i,j} came to the house and he_{i} hit me_{j}. (a) [298, (591)]

- (29) Odo-co-b sab cil-i-me-i ah-u Ø-ale-ce-b
do-DS-3s food boil-PRED-SS-3s bring-PRED give-3d-DS-3s

ale sab eu j-i-me-si dana uqa na
3d food that eat-PRED-SS-3d man 3s of_POSS

danah eu uqa caj-i nuo-lo-i
friend that 3s arise-PRED go-HabP-3s

Then she would cook some food and bring it and give it to them two.
They two_{i,j} would eat that food and then the man's friend_{i} would
get up and go. (a) [106-7, (513); 297, (588)]

In Amele, in case (a), where the pivot set of the controlling clause is properly included as a subset in the pivot set of the marked clause, SS marking is used. This is shown by examples (26), (28) and (29). In case (b), where the pivot set of the marked clause is properly included in the subject referent of the controlling clause, DS is normally used. This is shown by example (27).

³³ For the purposes of this exposition I do not distinguish between dual and plural semantically.

However, consider the following examples. Here, we have case (c), where the two referents overlap, and either SS or DS is possible.³⁴

- (30) a. Ege ho-co-mun sab jo-si-a
 1p come-PRED-DS-1p food eat-3d-TodP
- b. We_{i,j,k} came and they-two_{k,l} ate the food. (c)
 Ege h-u-me-b sab jo-si-a
 1p come-PRED-SS-1p food eat-3d-TodP
- We_{i,j,k} came and they two_{k,l} ate the food. (c) [296, (576),(577)]

Informally, we need to modify the definition of switch-reference given above as follows:

SS indicates that at least one element of the pivot set of the controlling clause is also an element of the pivot set of the marked clause.

DS indicates that at least one element of the pivot set of the controlling clause is not an element of the pivot set of the marked clause

where the pivot set is the discourse marker introduced by the agentive subject of the clause.

With the exception of the person restriction, this covers the full range of cases, as the following schematic illustration shows.

- SS: $\{i\} = \{i\}$
 $\{i,j\} = \{i,j\}$
 $\{i,j\} \supset \{i\}$
 $\{i,j\} \cap \{i,k\}$
- DS: $\{i\} \neq \{j\}$
 $\{i\} \subset \{i,j\}$
 $\{i,j\} \cap \{i,k\}$ (unless i is first person)

In general terms, a new group counts as a new agent, even if it includes the previous agent as a member, but a member of a previous group need not count as a new agent.³⁵

³⁴ Unless the subject of the controlling clause is first person, when SS must be used. This special status of the first person would need to be accounted for by a person hierarchy. See the discussion of Imbabura Quechua in chapter 2. I shall have nothing further to say about this restriction in what follows.

³⁵ There are interesting interactions with reciprocals; see Roberts (1987: 296, 306ff.) Basically, where the pivot set of the marked clause includes the pivot set of the controlling clause, as we have seen, normally SS is used, but if the marked clause has a reciprocal simultaneous verb there is a choice of SS or DS unless

In order to capture the full range of cases formally, we should require SS and DS markers to introduce anaphoric conditions of the following kind.

$$\begin{array}{l} \text{SS: } x_1 \cap x_2 \neq \emptyset \\ \text{DS: } x_2 - x_1 \neq \emptyset \end{array}$$

That is, SS means the intersection of x_1 and x_2 is not empty, and DS means that there is some element in x_2 which is not in x_1 . In the remainder of the paper, however, I shall use a more elegant definition which covers all the central cases, excluding only those involving intersection; as we have seen these would require some additional mechanism such as a person hierarchy in any case. The definitions of SS and DS which will be used are given below.

$$\begin{array}{l} \text{SS: } x_1 \supseteq x_2 \\ \text{DS: } x_1 \not\supseteq x_2 \end{array}$$

That is, SS indicates that x_2 is properly included in x_1 as a subset or is equal to it, and DS indicates that x_2 is not included in x_1 , where x_1 is the discourse marker introduced by the pivot (agentive subject) of the marked clause and x_2 is discourse marker introduced by the pivot (agentive subject) of the controlling clause.³⁶

5.4.2. Functional extensions

Unexpected uses of SS marking in Amele have already been discussed extensively in chapter 2 and 5.4.1, and will be returned to in section 5.5.

We saw in chapter 2 that in addition, cases of DS marking occur, which remain unexplained by a definition of switch-reference in terms of anaphoric relations between pivots, since the clauses actually have the same agentive subject referent. The explanation given for these examples by native speakers is that 'something has changed' or 'a new situation' is involved (Roberts 1987: 303). Roberts attributes the DS marking in these

the subject of the controlling clause is first person, when SS must be used.

³⁶ Note that although we need upper case plural DMs to represent plural NPs, in the statement of these anaphoric conditions lower case individual DMs are used: these are taken to be unspecified for number and hence neutral over singular, dual and plural. This is necessary if we wish to give a general formulation of the meaning of the switch-reference markers. It is also necessary because as we saw, lexical NPs in Amele are unspecified for number, so the DMs they introduce need to be able to unify with verbs with singular, dual or plural agreement marking.

cases to 'deictic changes ... in the area of time, place or world reference points'. He says that such uses of DS marking typically occur in clause chains in which a major participant has been established via a series of SS-marked verbs (though this does not seem to be generally true of the examples given below). He describes (1988: 60) how we know what has changed (time, place or world) rather vaguely:

often it is obvious that the change being indicated is deictic rather than syntactic and that these deictic changes are in the area of world, time, or place reference points. For example, a change of time marked by the SR system is often backed up by a temporal expression; a change of place marked by the SR system occurs most frequently with verbs of motion, and a change of location can also be indicated by a locative expression; a change of world marked by the SR system is normally a switch from an intended or proposed action to the real action itself or vice versa

We noted in chapter 2 that similar nonreferential functional extensions of DS marking occur in other languages with switch-reference. For example, Lenakel exhibits use of DS marking with coreferential subjects when there is a shift between future and non-future tense.

In this section I shall try to make more precise the conditions under which unexpected DS marking occurs. A selection of the relevant examples from Amele is reproduced in (31)-(42). The verbs with unexplained DS marking are in bold. Other examples of unexpected DS marking are given in Roberts (1987: 304, exx. (621) and (625); 305, ex. (628); 57, ex. (216); 62, ex. (245); 85, ex.(380)).

Examples (31)-(33) illustrate changes of place. Notice that they all involve verbs of motion, possibly as part of a serial verb construction in which the motion verb indicates direction of an action (Roberts 1987: 308), and in some cases they also involve adverbial expressions of location.³⁷

- (31) Mike uqa car **tuli-do-co-b** jic
Mike 3s car **start-3s-DS-3s** road

³⁷ Note that in (33), DS is used on the verb *ehitecebe* and the DS marking relates to the following verb *belom*, where the pivot set of the first, marked verb is included in the pivot set of the second, controlling verb. As the discussion in 5.4.1 shows, DS is the expected marking here.

to-d-u		b-i	Sioba	na	jo	cemenug
follow-3s-PRED			Sioba	of	house	near

ono	uqa	car	heewe-ce-b	taw-en.
there	3s	car	hold-DS-3s	stand-3s-RemP

Mike started the car and then followed the road up to Sioba's house and held the car there near the house. [304, (623)]

- (32) Age ceta **gul-do-co-bil** l-i bahim na tac-ein.
 3p yam **carry-3s-DS-3p** go-PRED floor on fill-3p-RemP

They carried the yams on their shoulders and went and filled up the yam store. [304, (624)]

- (33) Uqa cegul-t-en. **Odo-co-b** uqa
 3s meet-1s-3s-RemP **do-DS-3s** 3s

eh-ite-ce-be	uqa	ana-g	meme-g
take-1s-DS-3s	3s	mother-POSS	father-POSS

ca	ale	na	jo	na	bel-om
and	3p	of	house	to	go-1p-RemP

He met me. He did that, then he took me to their house, his mother and father's. [304,(626)]

Many examples which involve a change of place could also be seen as involving a change of time. This is particularly true of example (32) above and examples (34) and (35) below.

- (34) Ono **bi-bil-igin** cuha ijed
 there **SIM-sit-1s-DS** Sunday three
- eu o-co-b ija ija
 that get-DS-3s 1s 1s
- jic sacia-du-m-ig man wag
 road prepare-3s-SS-1s bird canoe
- u-m-ig Ethiopia ono l-i ton-oom
 get-SS-1s Ethiopia there go-PRED descend-1s-RemP

I stayed there for three weeks and then I prepared my journey,
 took a plane and landed at Ethiopia. [303, (618)]

- (35) Je eu **culo-co-hul** ni-nij-en oso
 talk that **leave-DS-1d** SIM-lie-3s INDEF
- na let-i lo-wo-na
 to cross-PRED go-1d-PRED

We two left that text lying there and moved on to another one. [303, (617)]

(35) must be seen as involving a metaphorical rather than a literal shift in place. Note that Roberts (1987: 250, (427)) gives an alternative translation for what appears to be the same example: 'Then we stopped talking about that and went on to something else.' This looks more like temporal shift is involved.³⁸

Roberts (1987:249) indicates that the verb *cul-ec* 'to leave', which occurs in (35), expresses discontinuative aspect; i.e. the notion that a situation has been discontinued or abandoned. Example (36) below similarly is said to involve completive aspect as expressed by the verb *he-doc* 'to finish/complete'; i.e. the notion that a situation is finished or completed. I shall return to this below. Examples (36) and (37) are clearer examples of a shift in time. (38) is also said to involve a shift in time, but might well be seen as involving a shift in modality.

³⁸ In example (35), the sequence *culocohul ninijen* is a serial verb construction. It is assumed by Roberts (cf. 1987: 239) that the DS marking is a marking on the whole construction and hence relates it to the next verb in the clause. It might be suggested that the DS marking on the first verb relates it to the second verb in the series and that DS rather than SS is used because the two verbs have different subjects. However, such an assignment is not supported by current analyses of serial verbs (see Foley & Van Valin 1984, and the references given earlier in this chapter).

- (36) Deel ijed **he-do-co-b** uqa cesel-i
 day three **finish-3s-DS-3s** 3s return-PRED

After three days he came back. [249, (421)]

- (37) Eu 1977 jagel November na
 that 1977 month November in

odo-co-b cul-ig-en.
do-DS-3s leave-1p-3s-RemP

That was in November 1977 that he did that and then he left it for us.
 [304, (620)]

- (38) Od-i-me-ig eu na cuha **fe-ce-bil**
 do-PRED-SS-2p that of Sunday **see-DS-2p**

hib na age meen qaig gaban-du-me-ig
 later 2p stone shoot gather-3s-SS-2p

ihoc f-i-me-ig ...
 enough see-PRED-SS-2p ...

Do that and then later take a look and you will see that the money you
 have collected will be enough ... [304, (619)]

The examples in (39)-(41) involve changes between actual eventualities and non-actual ones, usually a switch between intended and completed actions.

- (39) Aria meme-g eu mado-n, "Cois
 all right father-3s that say-3s-RemP OK
- eu **mado-co-min** l-ig eh-i l-i
 that **say-DS-1s** go-(SS)1s take-(SS) go-(SS)
- m-ih-ig-en," d-on. **Odo-co-b** li-me-i dana
 put-2s-1s-Fut say-3s-RemP **do-DS-3s** go-SS-3s man
- co cafa q-oc eu mado-n,
 mouth-3s close hit-INF that say-3s-RemP
- "Cois caja eh-i l-i
 OK woman take-(SS) go-(SS)

m-ud-ih-ig-en," do-n.
 put-3s-2s-1s-Fut say-3s-RemP

All right the father told her, "OK I say I will take you and give you to him." Then he went to the man with the closed mouth and told him, "OK I will bring the woman and give her to you." [305, (627)]

- (40) 'Hina gaim heew-ig-a eu
 2s crab hold-1s-TodP that
- mani-te-te-m ija sab met-ig-en,'
 roast-SIM-1s-2s-DS 1s food peel-1s-Fut
- do-n. **Odo-co-b** sab met-en
 3s-3s-RemP do-DS-3s food peel-3s-RemP

'You roast the crab that I caught for me while I peel the food,'
 she told him. Then, alright, she really peeled the food. [305, (630)]

- (41) Eu nu qila i ege
 that for now this 1p
- meen qaig eu mede
 stone shoot that nose-3s-POSS
- qo-qo-na. **He-do-co-b** eu fal-doc
 hit-1p-Pres finish-3s-DS-3s that fence-INF
- nu cabi sanan me-q-an.
 for work start put-1p-Fut

So now we are gathering that money. When we have finished that we
 will start to do the fencing work. [305, (629)]

Note that shifts in both directions can be indicated with DS marking: shifts from realis to irrealis are involved in (41) and in the first bold verb in (39); shifts from irrealis to realis are involved in (40) and in the second bold verb in (39).

I said earlier that all the verbs in a clause chain must share the tense, mood, polarity, status and some aspectual values of the final verb. The examples given here mostly involve continuation of switch-reference marking across sentence boundaries by use of a recapitulation clause, as in the second case in (39), (40), and (41), or shifts between the current speaker and a reported speaker, as in (39) and (40). This explains the fact that some of the verbs have different status and tense. However, this use of DS marking in

itself appears to be a way of allowing verbs to have different status values, and also in some cases different tense: thus in example (39) one of the verbs with aberrant DS marking, *madocomin*, is given a present tense translation whereas the remaining verbs in that chain are future tense, as is indicated by the inflection on the final verb *mihigen*. In example (38) above, also, nonreferential use of DS marking appears to licence a shift in status and possibly mood; this example could be analysed as involving a shift in status rather than in time.

A change in actuality appears to be indicated by a switch between current speaker and reported speaker, by a switch between realis and irrealis status (as indicated by future vs. non-future tenses), or by the use of an emphatic marker such as *ijom*, which indicates that the speaker has a high degree of certainty about the assertion (Roberts 1987: 266).

Finally, note example (42) below, which is presented by Roberts as involving a shift in time, but which is interesting because it also involves a change in the state of the entity being described.

- (42)
- | | | | | |
|-------------------|-------|--------------|-----------------|------|
| Ma | qa | cehe-ce-bil | ma | ben |
| taro | but | plant-DS-3p | taro | big |
| | | | | |
| m-i-me-i | | gulom | ibul-do-co-b | wal |
| become-PRED-SS-3s | | taro species | change-3s-DS-3s | ripe |
| | | | | |
| m-i-me-i | | bagac | qahe-ce-b | ma |
| become-PRED-SS-3s | | leaf | sprout-DS-3s | taro |
| | | | | |
| eu | jagel | Me | na | age |
| that | month | May | in | 3p |
| | | | | |
| huno-lo-ig. | | | | |
| pull_up-HabP-3p | | | | |

But for taro they used to plant it and then it grows big and becomes a fully grown corm. When the taro has ripened it sprouts leaves and they used to harvest it in May. [238, (397); 304, (622)]

Many of the examples which are said to involve temporal shifts contain temporal expressions. However all the examples which seem to involve a change in time rather than, or as well as, one of the other changes mentioned share a common property of another kind. Roberts (1987:235ff.) discusses the marking of aspectual meaning ('different

ways of viewing the duration of a situation', cf. 5.4.3) by lexical means, i.e. by the use of aspectual verbs either on their own or more commonly, in serial verb constructions of one kind or another. Three main types of aspectual meaning are indicated in this way: durative, inceptive and terminative (the latter encompassing distinctions between conclusive, completive, discontinuative and resultative; see Roberts 1987: 248-50). Completive, resultative, conclusive and discontinuative aspects are indicated respectively by the verbs *he-doc* 'to finish/complete'; *cuha-doc* 'to excel'; *cit q-oc* 'to bring to a conclusion' and *cul-ec*, 'to leave'. The inceptive (ingressive) indicates the beginning of a situation and is marked by the compound verb *sanan m-ec* 'to begin', or just by *m-ec*, 'to put, become'.

All the cases analysed as shifts in time involve one of these aspectual expressions. In example (35) the unexplained DS verb is the discontinuative aspect verb *cul-ec*; in example (36) it is the completive aspect verb *he-doc*. In example (37), the verb with unexplained marking is *d-oc*, 'to do' (see below), but the following verb is *cul-ec* 'to leave', although it may not be being used aspectually here. Example (41) could also be seen as a shift in time or situation as well as a shift in actuality, and in support of this analysis note that it contains unexplained DS marking on the completive aspect verb *he-doc*, while the following verb is the inceptive compound *sanan m-ec*. Finally, example (42) contains a number of uses of *m-ec*, including one following the unexplained DS marked verb.

What I am suggesting, therefore, is that rather than saying these examples involve a change in time, we should see the use of DS marking as reflecting a shift from one situation or event complex to another, which is marked by use of one of these aspectual forms.³⁹

The previous discussion relates to the final kind of example to be considered in this section: examples of recapitulation clauses with unexplained DS marking. A number of the examples we have looked at in this chapter have also included recapitulation clauses, and Roberts (1987: 251) gives more examples. Before we consider an anomalous example, see (43), where the recapitulation clause is in bold.⁴⁰

³⁹ Although it would not be surprising to find that this is an optional use of DS marking, in fact all the examples I have noticed with these aspectual markers do involve DS marking, with the exception of the resultative where I have seen only an example with SS marking (Roberts 1987:250); this particular aspect may behave differently.

⁴⁰ Note that in example (43) the second sentence functions as an expansion of the previous eventuality rather than a following event, so here the recapitulation clause is just tracking reference and its normal translation, 'having done that', is inappropriate.

(43)	Sain time	leih some	dana man	age 3p	jo house	eundec that_kind
	ben big	ca with	cehe-gi-na. build-3p-Pres	Od-i-me-ig do-PRED-SS-3p	cuamu room	ijed three
	o or	wal four	oso INDEF	eu that	odi like	gahe-gi-ne. break-3p-Pres

Sometimes the men make one of those houses bigger. They divide it into three or four rooms. [89, (418)]

Switch-reference across sentence boundaries is ruled out, but in narrative discourse, recapitulation clauses enable the switch-reference system to connect separate sentences.⁴¹ A recapitulation clause is the first clause of a new sentence. It may be a repeat of the final verb of the previous sentence, or it may be one of the two 'dummy verbs' *od-oc* 'to do' and *he-doc*, 'to finish'. The dummy verb has the same subject agreement marking as the final verb of the previous sentence. It enables the switch-reference system to connect this sentence with the previous sentence, by virtue of the fact that it is both anaphorically linked to the final clause of the previous sentence, and also linked by switch-reference marking to the second clause in its own sentence. It thus indirectly indicates whether the final subject of the previous sentence is the same or different from the subject of the first clause in the next sentence.⁴²

The dummy verb may occur in a 'stereotyped' form, *odo-co-b* 'he did it-DS' or *he-do-co-b* 'he finished it-DS' (Roberts 1987: 250ff.) In this case, it takes third person subject (and indeed object) agreement regardless of the agreement on the preceding clause.⁴³ These forms of the verbs have a special function to mark the completion of a particular series of related events and indicate that some new episode is about to begin. The DS form is used whether or not the subject of the preceding clause is the same as that of the following clause. An example is given in (44).

⁴¹ I am making a distinction here between clause and sentence, and define an Amele sentence as a sequence of syntactically linked clauses at least one of which contains a finite verb.

⁴² Roberts (1987: 117f.) notes that in some cases the clause to which the recapitulation clause is linked may be further back than the final clause of the preceding sentence; in all but one of the examples he gives it is impersonal clauses that it skips back over (examples (555)-(557)), in the other example some notion of discourse topic may be involved.

⁴³ Clearly, in a case where the agreement would have been third person singular anyway, it will not be clear whether the clause is a stereotyped form or a regular form.

(44) Man age man cunug age cul-i
 bird 3p bird all 3p leave-PRED

he-do-in. Odo-co-b mala sul-do-in.
 finish-3s-3p-RemP do-DS-3s chicken send-3s-3p-RemP

All the birds were completely exhausted so then they sent the chicken.
 [251, 432]

Example (41) above, the fencing example, is also cited by Roberts in this connection, and can be seen as involving episodic completion. A number of the other examples we looked at above could be analysed in this way too: in examples (33), (37), (39) and (40) unexplained DS marking is on a recapitulation clause of this kind. If we see forms of the verb *od-oc* as having terminative aspectual import, we can make a general statement to the effect that DS can be triggered by aspectual changes indicating a shift in the event complex, as well as by other changes.

This reanalysis of some of the examples may explain what at first sight seems to be a slight problem with a few of them: in some cases the unexplained DS marking does not seem to coincide exactly with postulated shift in time, place or actuality which is supposed to account for it. For instance, in the second example in (39) Roberts says that the DS marked verb *odocob* marks a shift from irrealis, to realis on the following verb *limei*, but this shift seems rather to coincide with the preceding inflectional complex marking the end of the direct quote *d-on*; if we attribute the DS marking to the aspectual trigger provided by the recapitulation clause this is not a problem. Similar difficulties may occur with (38); it is hard to tell given the translation, but the temporal adverb *hib na* 'later', seems to refer to the temporal relation between the doing and the looking, rather than that between the looking and the seeing. Of course, it is not necessarily required that the observed change in place, time, actuality etc. occur on the DS marked verb. See also the Appendix to this thesis for a possible alternative account for unexpected DS marking in Amele, which takes into consideration what Roberts (1987: 281-291) describes as a distinction between verbs according to whether they are 'agent-oriented' or 'goal-oriented'. On such a revised account, virtually all the examples of unexplained DS marking are accounted for, including those which I have just questioned. However, not enough information is available at this point about orientation in Amele for a conclusive proposal to be put forward.

In summary, we have observed the following types of triggers for unexplained DS marking:

- (i) A shift in eventuality episode indicated by an aspectual verb; this may be accompanied by (ii) and/or (iii) as well;
- (ii) A shift in location indicated by a verb of motion, and/or locative adverbial expressions;
- (iii) A shift in actuality indicated by a shift between current and reported speaker and/or a shift in tense between future and non-future, and/or use of emphatic markers.

Notice that we have moved some way from Roberts' classification of cases of unexplained DS marking as caused by shifts in world, time or place. The main difference is in seeing both his 'time shifts' and the cases involving recapitulation clauses as shifts in eventuality episode and in identifying aspectual verbs as the triggers of such shifts.

5.4.3. Switch-reference as parameter agreement

The account to be proposed is based on the idea in chapter 3 that the full range of functions of switch-reference systems can be accounted for if we see the switch-reference markers as indicating agreement or dis-agreement between clause-level information about parameters of the eventuality the clause introduces: its major protagonist, its temporal and spatial location, and the actuality of the eventuality.

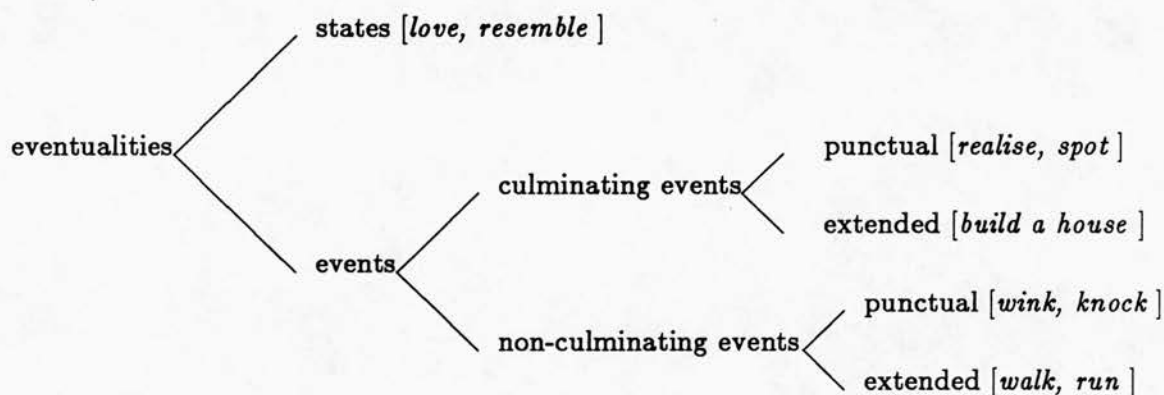
Before we see how this idea can be formally encoded in the semantic component of UCG, it is important to motivate the notion of an **eventuality**. So far, we have seen that versions of DR Theory which are designed to handle such phenomena as temporal reference, aspectual distinctions, and quantification over times all involve the introduction of a special type of discourse marker for eventualities: these eventualities hold over intervals and are related to one another by linear ordering relations such as relations of precedence and overlap. In InL, such eventuality indices are introduced by the verb, and normally percolate up to act as the index for the completed clause. We also saw that the eventuality indices are 'sorted': an index e_i indicates an event, an index s_i indicates a state, and an index a_i indicates an eventuality unspecified as to its aspectual type.

In the first half of section 5.4.3 I discuss in more detail the aspectual classification of eventualities, and in the last half of this section the notion of a structured eventuality index

is presented.⁴⁴

The aspectual classification of eventualities in Amele

I use the term 'eventuality' as a general technical term covering all kinds of descriptions of 'things going on the world'.⁴⁵ I assume that clauses are used to present eventualities. Figure (45) gives a general classification of types of eventualities, with some examples of verbs which centrally describe these types. The classification presented here is part of a long tradition stretching back to Aristotle but is based most closely on work done by Vendler (1976) and Mourelatos (1978), although I have changed the terminology to make it more self-explanatory. Other recent work in this area can be found in Verkuyl (1972), Jessen (1974), Taylor (1977), Dowty (1979), Moens & Steedman (1986), and Moens (1987).



The major distinction is between states and events. Sentences describing states refer to one or more participants and express properties of and relations between them, which are taken to hold constant over some (usually relatively long) period of time. No changes are involved and hence no successive phases. In contrast, sentences describing events refer to a changing state of affairs in which the participants are actively doing something, or

⁴⁴ By 'aspect' I mean *Aktionsarten*, i.e. broad classifications of types of eventualities, rather than grammaticised aspect such as morphological marking of the traditional progressive, past perfect etc. in English.

⁴⁵ Following Bach (1981); equivalently one could use a term such as 'situation'.

undergoing a change. An event is something that happens over a particular, usually limited period of time. The various distinctions within the set of events are ways of classifying them according to the way this period of time is perceived.

In brief, culminating events are perceived as having some consequence or result. Once the final point is reached a change in state takes place. These types of events have internal structure or successive phases: possibly a pre-culminating phase, the culmination, and the consequences. Extended culminating events are ones where there is a rather long pre-culminating phase; in such events, a process goes on in time until it reaches a particular and well-defined point. Punctual culminating events are ones where there is really no pre-culminating phase: the event is presented as occurring instantaneously. In contrast, non-culminating events are ones which are homogeneous and have no internal successive phases, no expected final point, and no expected consequences. These may also be punctual or extended in time; in the latter case they are called **processes**. The distinction between culminating and non-culminating events is also called the **telic/atelic** distinction.

It is an aspectual classification of this kind which underlies the definition of the sorted eventuality discourse markers *a*, *e*, *s* as **eventualities**, **events** and **states**.

Vendler (1976) treated his classification as a taxonomy of verbs. However, this is not satisfactory, because the presence of various auxiliaries and adverbials, and the nature of the subject and object NPs, are all important in determining the classification on any particular occasion of use of the verb. It is now considered more accurate to regard the classification as one of clause meaning. Verbs will fall into one category or another basically, but the presence of other elements may change this category in particular cases. In fact, almost any verb may occur in context in almost any category.

In addition to grounding the notion of aspectual classification of eventualities which is assumed in this thesis, I wish to propose in this section that in giving an aspectual classification of predication in Amele, and indeed more generally, we should extend the framework which has been developed in the literature to include a dimension of **control**: a parameter of whether or not a volitional agent participant is involved in the eventuality.⁴⁶

⁴⁶ By 'control' here I do not mean syntactic control in the sense of control of unexpressed subjects in infinitival subordinate clauses. Clearly there are some connections between this type of control and switch-reference (see Simpson & Bresnan 1983), but an exploration of these does not fall within the scope of this thesis.

I have argued that the relevant definition of the switch-reference pivot in Amele is that of 'agentive subject'. The basis for the argument was the behaviour of switch-reference marking when the controlling clause was an impersonal construction. We saw in chapter 2 that impersonal constructions in Amele involve a class of predicates which have been identified in other languages as 'unaccusatives' (see, inter alia, Perlmutter (1978) for the origin of this term, McCloskey (1984) for explicit identification and cross-linguistic generalisation of the class of predicates).

The basic insight is that intransitive, i.e. single argument, verbs which are superficially alike, actually divide into two classes: 'unaccusative verbs' and 'unergative verbs'.⁴⁷ Unergative verbs include all agentive intransitive verbs, such as *shout*, *hide*, etc. In contrast, the class of unaccusative verbs includes no verbs with agentive arguments, but many verbs with a single theme or patient argument, such as *arrive*, *remain*, etc. See Marantz (1984), Grimshaw (1987) for further discussion of this distinction.

Unaccusative verbs behave in many ways like passive verbs, and this resemblance is usually attributed to an underlying representation of unaccusatives in which they are assigned an underlying object, but no subject. It is then assumed that syntactic constraints of some kind force movement of this underlying object into subject position. This is called the 'Unaccusative Hypothesis'. Such an analysis is required by theories which assume a rather strict initial correlation between grammatical functions and semantic roles. Alternatively, on an LFG account, the surface subject of the unaccusative verb is not said to be an underlying object; rather, both objects of transitive verbs and subjects of unaccusative verbs are simply assigned the 'theme' semantic role.

In addition to explaining the marked assignment of theme/patient role to apparent subjects, the concept of unaccusative verbs has been used to account for a range of syntactic behaviour, which interestingly includes agreement phenomena in 'Split-S' languages like Eastern Pomo, which was discussed in chapter 2. Grimshaw (1987:246-7) gives a comprehensive survey of the literature.

There has been considerable discussion of whether there is a clearly definable semantic basis for the distinction, which can be generalised crosslinguistically. It does seem to be a universal that agentive predicates never appear as unaccusatives. The classification below is

⁴⁷ Terms due to Geoffrey Pullum, as cited in Perlmutter 1978:186,n.4.

based on Perlmutter (1978:162-3), who also notes that verbs of motion are ambiguous between the two categories.

UNERGATIVE: - willed or volitional acts (including manner of speaking verbs and predicates describing sounds made by animals), and certain involuntary bodily processes.

UNACCUSATIVE: - predicates expressed by adjectives in English, predicates whose argument is a Patient, inchoatives, verbs of existence, duratives, predicates describing the non-volitional emission of stimuli that impinge on the senses, aspectual predicates.

While this classification has been challenged, as has the whole idea of providing a semantic basis for the distinction, it does seem likely that at least the core cases of the unaccusative and unergative categories are predictable on the basis of semantic properties, although syntactic factors may need to be invoked in defining the classes for particular languages. There is some suggestion that the classification may be due to eventuality type rather than being lexically specified for individual verbs (see Grimshaw 1987:248-9, quoting Rosen 1984).

The motivation for introducing a dimension of control into the aspectual classification of eventualities is that the eventualities introduced by unaccusative predicates are distinguished by lacking an agentive controller. Switch-reference in Amele, then, can be taken to hold only between controlled eventualities, since only these provide agentive switch-reference pivots to be anaphorically related by the switch-reference markers; uncontrolled eventualities are by default treated as 'same subject' since no new controller is introduced.

To my knowledge, such a parameter has not previously been incorporated into Aktionsarten frameworks. There is at least one obvious reason for not so including it: unlike the other distinctions between eventuality types, it is not definable in terms of the temporal reference and temporal structure of the eventuality, using a time-line constructed out of temporal intervals. That is, there are obvious ways of giving formal definitions for the aspectual distinctions normally made, but not for control.

However, there are also reasons *prima facie* why some such extension seems plausible. There is some evidence that the aspectual distinctions we have already described in fact cannot be properly defined just in terms of temporal intervals.

First, very recent work on temporal reference and eventuality type (eg. Moens & Steedman 1986, Webber 1987, Zeevat 1987) has suggested that it is more useful and appropriate to distinguish eventuality types, and to individuate eventualities, on the basis of their logical and causal structure and relationship with other eventualities. For example, Moens & Steedman (1986) suggest that we can give an elegant account for the aspectual distinctions in figure (45) if we define eventualities as having structure in the form of preconditions and consequences. In such an approach to aspectual classification, there is no reason to reject a dimension of control.

Second, the relation between temporal, logical and causal structure is itself unclear and awaits further research. For example, many 'temporal' connectives such as English *when* can also identify causal or logical relationships between the eventualities they connect. Such shared temporal, causal and logical meaning characterises many systems of switch-reference markers.

Third, both the type of account given in Moens & Steedman (1986) and my own proposal are in accord with less formal philosophical work, which has considered the notions of **causality** and **intentionality** (implying agency) to be of pre-eminant importance in the individuation of events. For example, Davidson (1980) assumes that part of our individuation and typology of actions and events is indeed whether a volitional agent has 'caused' them.

Besides this kind of support from the literature, there is a further argument for the proposal, which goes like this. We saw that the literature on aspectual classification was at one time concerned with the question of whether the proposed classification should apply to verbs (predicates) or to clauses (propositions) or both. Crucial evidence was that even if one seemed certain of the classification of a particular verb, on a particular occasion of utterance some other reading could be forced, depending upon the morphological properties of the verb form and the type of arguments it took. We saw that the current assumption is that it is most useful to classify eventualities on the basis of complete clauses, although a relatively systematic description can be given of the basic classification of verbs and the ways in which non-basic readings can be derived (see Moens (1987), Moens & Steedman 1986).

Now, an exactly parallel difficulty arises with control. Although it seems that some predicates describe actions and events which are inherently controlled, while others describe actions and events which are inherently uncontrolled, it is usually possible to

'force' one or the other reading in context. As an example, consider the systematic use in Amele of DS (rather than SS) with a following impersonal construction, to give a 'causative' reading implying a different and unidentified causer. Good examples come from Eastern Pomo, as well, where as we saw in chapter 2, for some verbs, it is only through the agentive properties of other constituents in the sentence that an agentive reading is possible.⁴⁸

So, in both the case of the aspectual distinctions described in figure (45), and the case of control, the characteristics of the NPs in the sentence are important in 'forcing' non-typical readings on the verbs. This brings us to the second half of the argument. Aspectual distinctions in meaning, such as distinctions between culminating and non-culminating events, have frequently been compared with distinctions in nominal meaning such as distinctions between definite and indefinite NPs or between count and mass NPs (Mourelatos 1978). In the languages with which we have been concerned, the degree of 'control' or agentivity of a NP (which possibly may be modelled using an 'animacy' hierarchy of the kind proposed by Silverstein 1976) is matched by verbal distinctions in whether or not the eventuality is a 'controlled' one. This is particularly true of Eastern Pomo, where as we have seen, the degree of control in the eventuality as a whole is a function of the inherent degree of control of the verb and the inherent degree of control of its NP arguments.

Hence the nature of the meaning expressed by Aktionsarten distinctions and by control distinctions appears to be similar in that both involve clause-level meaning which may be manifested on either nominal or verbal elements of the clause or both.⁴⁹

Finally, we could argue for the proposal on empirical grounds. First, if part of our aim in establishing an aspectual classification is to account for the distribution of adverbs, then we have to account for the distribution of those adverbs which refer to intentionality as well: *intentionally, unintentionally, deliberately, accidentally*, etc. Such adverbs can themselves force particular readings. Second, in Eastern Pomo and certain other American Indian

⁴⁸ As we saw in chapter 2, Eastern Pomo exhibits 'Split-S' and 'Fluid-S' marking, having three types of verbs: inherently uncontrolled verbs which require a S_P (patient) subject, verbs which may take a S_A (agent) subject or a S_P (patient) subject depending on the degree of control exhibited in the situation being described, and verbs which may take either kind of subject depending upon the inherent agentivity of the subject NP.

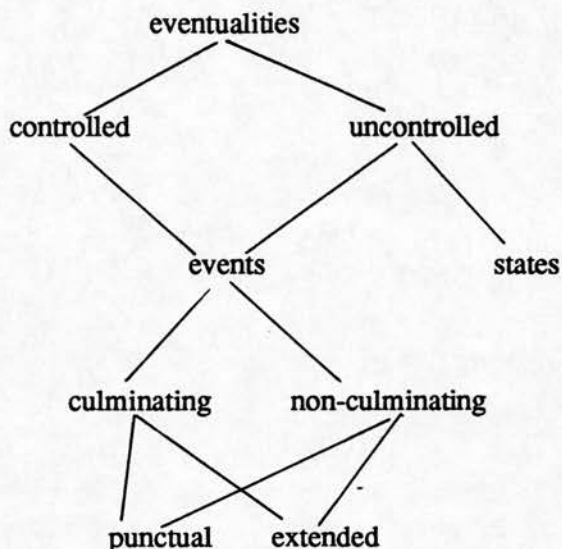
⁴⁹ A question which remains unanswered here is whether or not other types of meaning which percolate between NPs and verbs should also be parameterised in aspectual types of distinctions, for example other types of 'transitivity' (Hopper & Thompson 1980) such as iterativity, or exhaustiveness of the application of the action.

languages such as other Pomo languages and Lakhota, such a distinction must be a necessary part of the eventuality classification, since it determines the distribution of 'Split-S' and 'Fluid-S' marking, and of other morphological inflection on nouns and verbs.

If we adopt the proposal that an aspectual distinction should be made in terms of control, we then have to consider the question of how this additional distinction is to be encoded in the grammar. A prior question is how the aspectual distinctions described in (45) and the control distinction are related.

Prima facie the basic traditional aspectual distinction between events and states correlates quite closely with a distinction between predicates which have volitional agent participants and predicates which have only experiencer participants. All the impersonal constructions we considered would seem to be states. Hence, presumably, Davidson's attempt to base his classification of events largely upon intentionality, distinguishing events as actions or non-actions. However, we cannot completely collapse the two distinctions. First, we might argue that some states *do* involve volitional agents, eg. progressive forms if they are analysed as states, or examples like *I live in Edinburgh*. This example could be dismissed by saying that it only makes sense to talk about volitional agency when some sort of causal act is involved; that perhaps I act volitionally in the first instance by causing that I live in Edinburgh (or even at regular intervals by actively maintaining the state of living in Edinburgh), but that it is not appropriate to identify me as causal agent of the state itself. Even if one accepts this rebuttal and allows the claim that all states lack volitional agents, there remains the difficulty that within the class of what we would normally call events, we still have to distinguish those with volitional agents from those without, including those with inanimate subjects.

In sum, it seems that there *is* some connection between having a volitional agent, and the other, independently motivated, eventuality classifications, but it is a complex one, so that on the whole it may be better to see the two classifications as largely crosscutting rather than part of a single set of distinctions. Hence, the kind of eventuality hierarchy we might propose for Amele and other languages would be in the form of a lattice rather than a simple tree to capture the complex interrelations between Aktionsarten and control. This is illustrated in the following diagram.



We could encode the additional information about control in the sorted eventuality discourse markers which UCG distinguishes, i.e. making a distinction between controlled and uncontrolled sorts of events.⁵⁰ In fact, in the account which follows, we encode this information indirectly, deriving it from the agentivity value of the switch-reference pivot. We encode whether the eventuality is controlled by whether there exists what we call a ‘protagonist’. This is a more efficient way of handling the impersonal data in Amele, since it is the notion of agentive subject which is important, not just the notion of agent. However, we shall return to this question in the account suggested later for Eastern Pomo .

The structured eventuality index

We saw in the introduction to section 5.4 that, given a standard UCG account, from the interpretation of the medial switch-reference marked clause, all we can reasonably expect to know about the semantics of the following controlling clause is encoded in the representation $[a]A$, i.e. the clause has some eventuality index $[a]$ whose aspectual sort is unspecified, and some set of semantic conditions A . We handle the full range of switch-reference phenomena in Amele by introducing a **structured eventuality index** in place of the unstructured index $[a]$. This structured eventuality index incorporates **eventuality parameters** which represent that clause-level information about the eventuality that seems to be involved in switch-reference relations. That is, the motivation for the eventuality parameters which are defined is that these encode that information which needs to be

⁵⁰ In an unpublished paper on Eastern Pomo, Adger (1988) moves towards this kind of approach.

'pulled out' of the semantics *A* of the following clause in advance of full interpretation of this clause.

Let an eventuality index be a triple $\langle Id, Aspect, Parameters \rangle$, where:

- (i) *Id* is a uniquely identifying integer $1, 2, 3, \dots, n$;
- (ii) *Aspect* is a sorted eventuality variable, chosen from *e* for an event, *s* for a state, *a* for an aspectually unspecified eventuality, and perhaps others; and
- (iii) *Parameters* is a parameter list $\langle Protagonist, Location, Actuality \rangle$.

The parameter list is made up as follows:

- (a) *Protagonist* is an individual discourse marker chosen from the set $\{x_1, x_2, x_3, \dots, x_n\}$;
- (b) *Actuality* is a value in the set {actual, non-actual}; and
- (c) *Location* is a sorted locational discourse marker chosen from the set $\{l_1, l_2, l_3, \dots, l_n\}$.

The values of the eventuality parameters are assigned as follows.

For any regular verb, the protagonist of the eventuality is defined as its agentive subject argument in the way specified at the end of 5.4.1; that is, the value of *Protagonist* is lexically specified. We can see the *Protagonist* as inherently agentive. (What happens when there is no agent we shall see in section 5.5.)

The actuality of the eventuality is a function of the STATUS of the fully inflected verb plus possibly other factors such as whether there is a shift in the source of the speech (between current and reported speaker) or use of emphatic markers such as *ijom*. The default value for actuality is {actual}.

The value for location will be assigned on the basis of adverbial expressions which may have occurred previously in the text. In addition, the location parameter may be altered by verbs of motion. Part of the meaning of a verb of motion such as the verbs glossed as 'left', 'went', 'crossed', 'took' etc. in the examples in 5.4.2 will be that the *Location* value for the eventuality index it introduces is required to be distinct from the *Location* value of the eventuality index for the previous clause. This is analogous to the movement of the temporal reference time which has been observed in narrative text (see Hinrichs 1986, Partee 1984).

On this revised account, the eventuality indices for the two clauses in example (17) would be respectively (46) and (47).

- (17) uqa ho-co-b sab je-i-a
 3s come-DS-3s food eat-3s-TodP

He_i came and he_j ate the food.

(46) [1, e, <x₁, l₁, actual>]

(47) [2, e, <x₃, l₁, actual>]

We can refer to a structured eventuality index in shorthand by mentioning its aspectual sort subscripted with its *Id* integer, for example as e₁, e₂. Hence we can also write (46) as (48).

(48) [e₁, <x₁, l₁, actual>]

In addition, if P_i is the i^{th} parameter label, then we write $P_i(a)$ for the value of the i^{th} parameter in a . Thus, the value of the parameter label *Protagonist* in a is written *Protagonist(a)*.

In comparison with the sorted discourse markers of the standard UCG account, the new information encoded in the eventuality index resides in these three eventuality parameters. To see this, compare the sign for the verb *meten* 'he peeled', as given in 5.3.2 and in the new notation:

meten
 S[root,rem_p,realis]NP[3,s,+ag]:x₁NP[_,_,_]:x₂
 [e₁] [peel'(e₁,x₁,x₂) & e₁ < now]

meten
 S[root,rem_p,realis]NP[3,s,+ag]:x₁NP[_,_,_]:x₂
 [e₁, <x₁,_,actual>] [peel'(e₁,x₁,x₂) & e₁ < now]

Notice that the eventuality protagonist is identified with the subject argument x₁.

We can now try to generalise the relation involved in switch-reference marking. The analogue of our earlier definition of the markers as indicating whether or not a disjoint

agentive subject was present in the controlling clause would treat SS as showing that, given two eventualities e_1 and e_2 , then Protagonist (e_1) \supseteq (e_2). However, in order to capture the anomalous DS marking, we need a somewhat richer relation between eventualities.

Thus, we define an agreement relation ' \approx ' between eventuality parameters such that:

If a_i, a_j are structured eventuality indices (SEI's), then

$$\begin{aligned} \text{Protagonist}(a_i) \approx \text{Protagonist}(a_j) &\Leftrightarrow \text{Protagonist}(a_i) \supseteq \text{Protagonist}(a_j); \\ \& \text{Actuality}(a_i) \approx \text{Actuality}(a_j) &\Leftrightarrow \text{Actuality}(a_i) = \text{Actuality}(a_j); \\ \& \text{Location}(a_i) \approx \text{Location}(a_j) &\Leftrightarrow \text{Location}(a_i) = \text{Location}(a_j).^{51} \end{aligned}$$

If a_i, a_j are SEI's, and $\text{Parameters}(a_i) \approx \text{Parameters}(a_j)$, then $a_i \approx a_j$.

I use this formal apparatus to capture the interpretation of switch-reference markers. The semantics of the switch-reference markers specifies an agreement or dis-agreement relation between the two eventualities (in addition to specifying a temporal relation between the eventualities introduced by the two clauses). The SS marker introduces a condition in the semantics that $e_i \approx e_j$, and the DS marker introduces the condition that $e_i \neq e_j$. Hence, the signs for the verb 'come' marked for third person singular subject agreement and sequential SS and sequential DS would be:

humei
 S/S:[a_1]ANP[3,s,+ag]: x_1
 [$e_1, \langle x_1, _ , \text{actual} \rangle$] [$\text{come}'(e_1, x_1)$] &
 $e_1 \approx a_2$ &
 $e_1 < a_2$ &
 [a_2] A]

hocob
 S/S:[a_2]ANP[3,s,+ag]: x_1
 [$e_1, \langle x_1, _ , \text{actual} \rangle$] [$\text{come}'(e_1, x_1)$] &
 $e_1 \neq a_2$ &
 $e_1 < a_2$ &
 [a_2] A]

⁵¹ It may turn out to be necessary to specify a looser relation between Locations, which will allow 'overlap'.

The signs for simultaneous SS and DS markers will specify the temporal relation of simultaneity, 'O', instead of that of sequentiality, between the two eventualities, and the signs for simultaneous DS markers will in addition specify that both eventuality indices will have a particular value for ACTUAL.

This means that while SS marking indicates that the eventualities agree in all three eventuality parameters, DS marking indicates that they disagree in at least one parameter, and possibly in others. It is this definition of DS marking which enables us to account for the full range of functional extensions of DS as illustrated by the examples in section 5.4.2. The full definition of the 'dis-agreement' relation, \neq , says that if a_i, a_j are SEI's, then $a_i \neq a_j$ iff $\text{Parameters}(a_i) \neq \text{Parameters}(a_j)$, i.e. iff:

$$\begin{aligned} & \text{Protagonist}(a_i) \neq \text{Protagonist}(a_j), \\ & \vee \text{Actuality}(a_i) \neq \text{Actuality}(a_j), \\ & \vee \text{Location}(a_i) \neq \text{Location}(a_j).^{52} \end{aligned}$$

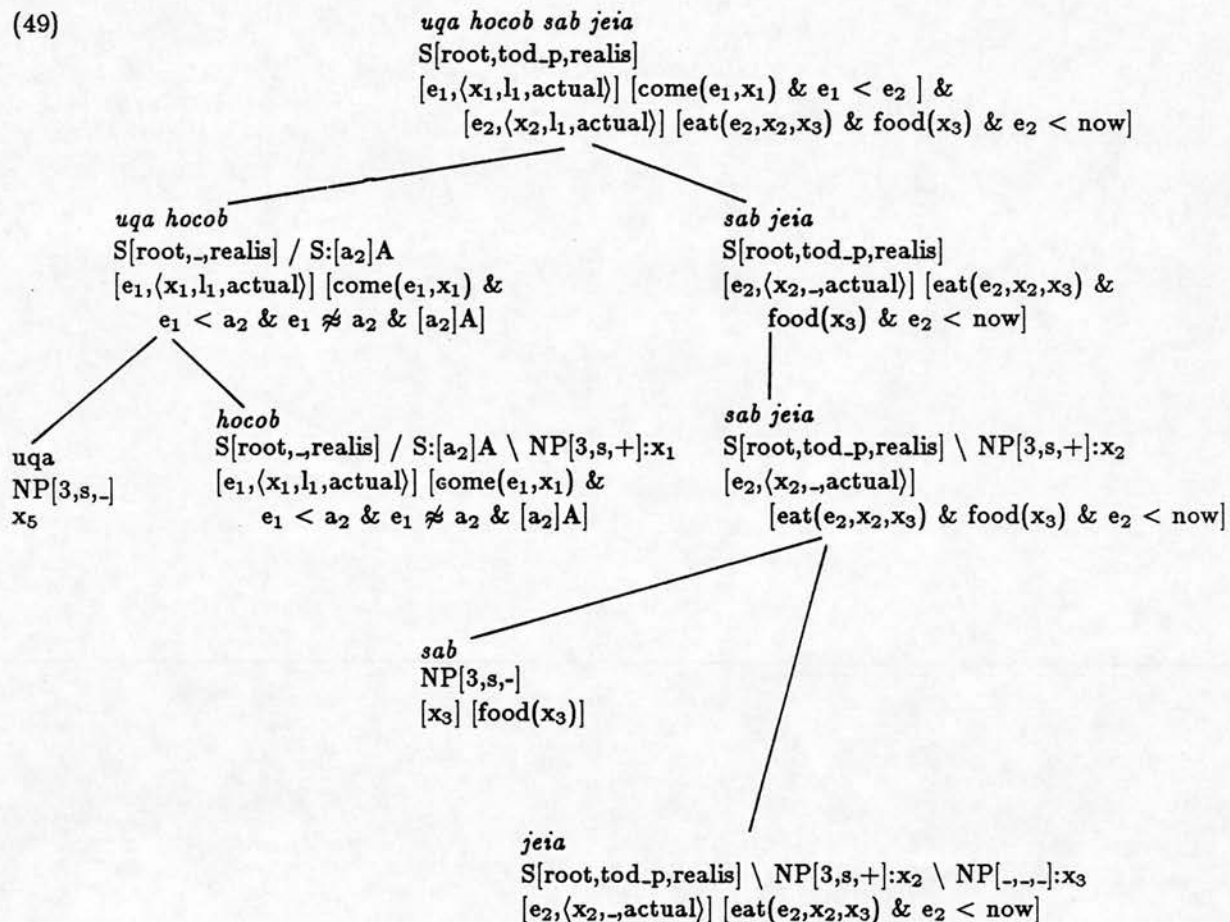
Hence, a DS marker on a verb indicates a shift in the parameters of the next eventuality. The default is a change in Protagonist, but changes in Actuality or Location are also possible.

We need to account for the fact that the default and preferred meaning of DS marking remains a shift in reference of the switch-reference pivot, the Protagonist. The order in which the three parameters are listed is significant in this respect. When a switch-reference marked clause is interpreted, the switch-reference marker is taken to indicate only an agreement or dis-agreement relation between the two eventualities, although language users will 'know' that the parameters are preferentially ordered in terms of significance for agreement. When the controlling clause is interpreted, information will be given about the agreement relations between individual parameters. This will enable full interpretation. Pragmatic or discourse factors such as whether a major participant has been established in context will come into play here as well.

Figure (49) gives the full derivational tree for the example sentence (17) on the revised account.

⁵² That is, a relation of dis-agreement holds if of those pairs of Parameter values for which the eventualities are defined, at least one pair is in the relation specified.

(49)



So far, I have not said anything about those unexpected uses of DS marking which are triggered by terminative and/or inceptive aspect or by 'stereotyped' forms of recapitulation clauses, both of which mark a shift from one eventuality complex to another. To account for these related phenomena, we need two things. First, we need a way of grouping eventualities into eventuality complexes or **episodes** and a way of indicating closure, opening and shifts between such episodes. Second, we need a way of accounting for the anaphoric relation which holds between the eventuality index of a final clause in one sentence and the eventuality index of the recapitulation clause which begins the next sentence.

The latter is in fact the only additional mechanism we need in order to account for recapitulation clauses, since once we have an account for this anaphoric relation everything else will follow from the account given for switch-reference marking in general. Indeed, the anaphoric relation itself will be handled using some adaptation of independently motivated principles of discourse anaphora which specify the possible anaphoric relations between DMs. That is, as well as the relations we have already specified as holding

between eventuality indices, we have the ordinary anaphoric linkage relations of '=', etc. So that if $e_1 = e_2$ then this simply means that these two DMs refer to the same eventuality.⁵³

Although the four types of trigger of DS marking - shift in protagonist, in location, in actuality or in event complex - are superficially alike, in fact they differ in that the first three concern the internal characteristics (parameters) of some particular eventuality and the last concerns the place such an eventuality might have in some sequence or complex of related eventualities.

So far, we have defined two kinds of information about relations between distinct eventualities:

- (i) temporal ordering relations of precedence or overlap;
- (ii) relations of agreement or dis-agreement in their eventuality parameters (protagonist, location, actuality)

The most promising approach to defining a more sophisticated notion of the 'eventuality structure' of a text, which will incorporate the notion of eventuality episode which we need, is that taken by investigators such as Moens & Steedman (1986), Webber (1987) and Zeevat (1987), who were mentioned in the earlier discussion of aspectual classification. The basic idea is that in situating any single upcoming eventuality in the textual structure, decisions need to be made concerning where it is to be attached in the hierarchy of eventualities, and how it is to be attached, i.e. by what kind of relations. See especially Zeevat (1987) for worked out examples of hierarchically ordered eventuality trees; he assumes a basic classification of the textual function of each sentence from which temporal relations are worked out. There is no space to develop a detailed proposal along these lines here, so I will leave this for future research. Such an account would proceed by defining a notion of **eventuality episode**, and allowing terminative or inceptive aspect to trigger a shift in episode representing the closure of one eventuality complex and the opening of another. We would then modify our definition of the agreement relation '≈', which holds between eventuality indices, so that SS marking constrains the eventualities to belong to the same episode, whereas DS marking may be licenced by a shift in episode. The difference in temporal interval between the eventualities, which Roberts responded to

⁵³ As with individual DMs, which of the set of possible anaphoric relations actually holds is a matter for additional resolution heuristics, cf. Calder, Klein, Moens & Zeevat (1986).

in giving his description of the examples in question, would just follow from the difference in episode.

The selection of information to be included in the structured eventuality index was made on the basis of which parameters of coherence between eventualities are grammaticised in the language, both in the switch-reference system and less directly in those elements which appear to trigger DS marking, such as aspectual markers.⁵⁴ The resulting parameters encode very much the kind of information that Hopper & Thompson (1980) identified as transitivity features: the agency and volitionality of participants, aspectual distinctions between completed and uncompleted events, realis or irrealis mode, although their list did not include location (see chapter 3). In addition, work in the philosophy of language and formal semantics, especially work on indexicality, has tended to select a very similar range of elements as defining the 'context' or 'circumstances' with respect to which an utterance is to be evaluated, and with respect to which the meaning of indexical elements is defined. For example, Kaplan (1977:22-3) lists speaker, time, position and world as important in this respect.

Although I reached my conclusions about the range of functional extensions available crosslinguistically for DS independently of Roberts and on the basis of consideration of a number of languages, the above account can be regarded as a first step towards formalising his idea that it is time, place and world which are important in accounting for the Amele functional extensions of DS marking.⁵⁵

However, there are certain noteworthy differences between my account and the kind of account which Roberts seems to envisage from his remarks in (1987:292,303) and (1988:46,60). From what Roberts says he seems to regard the possibility of functional extension of the SR markers as a matter for pragmatics rather than semantics, although he cites Lewis's (1972) ideas about semantic theory: he speaks of it as involving 'discourse deixis' and having a 'pragmatic (and) deictic role/function' or being a 'pragmatic discourse device'. I have proposed an account which encodes all the possible functions of switch-reference markers in a grammar with a developed semantics and a discourse component, and have restricted the role of pragmatics to choice of one of these possibilities on some

⁵⁴ Clearly, factors other than these may contribute to discourse coherence more generally, see inter alia Halliday & Hasan (1976), Grosz & Sidner (1985).

⁵⁵ Cf. Roberts (1988:61,n.20): 'It is not clear how one would account for the operation of the Amele SR system on a formal basis. At one level the rules for marking SS/DS are fairly rigid (...), however'

particular occasion - much as Kamp (1981), (1983) etc. claims only to account for possible anaphoric relations, not to provide heuristics for actual anaphor resolution.

In addition, Roberts anticipates a possible world account of modality as a basis for explaining those examples where a shift in actuality triggers use of DS marking: i.e., presumably a switch from one possible world to another, or a switch between that possible world which is identified as the 'actual' world and some other possible world, would be seen as the trigger in such cases, much as a switch in locations is in other cases. In contrast, my account does not presuppose a possible world semantics, although such a semantics may turn out to be the best way to define a distinction between actual and non-actual (cf. Kaplan 1977:19).

5.5. Switch-reference with impersonal constructions

I have said that the switch-reference pivot in Amele is constrained to be an agentive subject NP. The evidence for this is the behaviour of switch-reference marking when the controlling clause is an impersonal construction or has an inanimate subject. In such cases, unexpected SS marking normally occurs although strictly speaking there is no coreference between the subject NPs. This argument was presented in chapter 2. In order to complete our account of switch-reference in Amele, it is necessary to show how it works for switch-reference involving these constructions.⁵⁶

There are two kinds of impersonal construction in Amele. These were discussed in chapter 2, but will be briefly reviewed here. I shall identify them as types I and II. A schematic representation of type I is given in (50a) and a schematic representation of type II is given in (50b); representative examples of each type are given in (51) and (52) respectively.⁵⁷

(50) a. TYPE I:

NP(Experiencer) + NP(Cause) + Inflection

⁵⁶ For further discussion of these constructions, see Roberts (1987: 63, 67, 163, 166, 204, 220, 233, 280-1, 299ff., 315ff.)

⁵⁷ Roberts (1987:264) briefly mentions a subtype which expresses a continuing desire; the second element is the noun *gale*, 'desire', and the first element, which describes the habitual desire, is a PP functioning as object complement with the verb within the PP in the infinitival form. Eg. *Ija ceb j-ec nu gale tena*, 'I like to eat betelnut'.

(50) b. TYPE II:

NP(Experiencer) + V(complement) + Inflection

- (51) Ija wen te-na-Ø
 1s hunger 1s-3s-pres

I am hungry. [315, (679)]

- (52) Ija nu-ug-a te-na-Ø
 1s go-2s-IMP 1s-3s-pres

I want to go. [264, (489)]⁵⁸

The two types of construction have exactly the same form, except in whether the second element of the clause is a NP with the thematic role of Cause, or a verbal complement. In each case the first element of the clause is a NP with the thematic role of Experiencer, and the final element is an inflectional complex without a lexical verb, consisting of object agreement with the Experiencer NP, third person singular subject agreement, and the normal finite verb inflection for tense/aspect/mood/polarity. Note that although the normal Amele word order, S O V, would suggest that the Experiencer NP is subject, this cannot be the case since it triggers object agreement marking on the verb. However, any other order of constituents results in an ungrammatical sentence, eg. in Type I the order NP(Cause) followed by NP(Experiencer) is ruled out: **wen ija tena*. Roberts suggests that this is due to the fact that initial position, as well as being subject position, is topic position, and there is a constraint such that the topic position must be occupied by that NP which is highest on an animacy hierarchy such as that proposed by Silverstein (1976).

In Type I, the NP in the cause role must be one of a closed class of nouns, some of which, including *wen*, only occur in this construction. All refer to physical or psychological states which are understood to hold of the Experiencer NP. Type II is a desiderative construction with the verbal complement identifying the action which is desired. Unlike the Cause NP of Type I, the verbal complement position is fully productive - any verb can occur. It takes either imperative mood, as in (52), in which case present or future desire is indicated, or the remote past tense, in which case contrafactual desire is indicated and the inflectional complex at the end is marked for contrafactual mood.

⁵⁸ Present tense is zero-marked for a third person singular subject.

In both types of impersonal construction, subject agreement marking must always be third person singular. In Type I, there are two possible explanations for this. One is that agreement is with the Cause NP, which is always third person singular, making this the subject NP, and the other is that the agreement is third person singular default agreement which always occurs in Amele in the absence of a trigger in the appropriate grammatical function. In Type II, it seems clear that the third person singular subject agreement on the final inflectional element is default agreement and that there is no overt subject; the alternative would be to make the less likely supposition that the verbal complement constituent is dominated by a NP node and acts as subject.

In chapter 2 we saw a number of examples of switch-reference relations in which the controlling clause was an impersonal construction of Type I or Type II. See example (53).

- (53) Ija bi-m-ig wen te-i-a
 I come_up-SS-1S hunger 1s-3s-TodP

I came up and I became hungry. [300, (598)]

In such cases, SS marking is used despite the fact that, even if the controlling clause could be said to have a subject NP, the latter is certainly not coreferential with the subject of the marked clause. DS marking is used in this context only to effect a kind of causative construction. Thus in example (54) it indicates that some unidentified other party caused the eventuality described in the impersonal clause.

- (54) Ija be-ce-min wen te-i-a
 I come_up-DS-1s hunger 1s-3s-TodP

I came up, and something made me hungry. [300, (601)]

In Amele, controlling clauses with subjects which are inalienably possessed body parts or weather expressions are found to behave in the same way as impersonal controlling clauses with respect to switch-reference marking. That is, SS marking is used regardless of the fact that strictly speaking the subjects of the two clauses have disjoint reference. In such cases, DS may also be used with the causative interpretation mentioned above. Controlling clauses with other inanimate subjects offer a choice of SS or DS marking, depending upon whether the subject is being regarded agentively or not. See examples (55)-(59).

- (55) Ija co-cob-ig wa hedo-i-a
I SIM-walk-1s_SS water finish-3s-TodP

As I walked along the rain stopped. [300, (600)]

- (56) ? Ija co-cob-igin wa he-do-i-a
I SIM-walk-1s_DS water finish-3s-TodP

? As I walked along something made the rain stop.

- (57) Ija ta-taw-ig ija am-i wal-do-i-a
I SIM-stand-1s_SS I eye-1s spin-3s-3s-TodP

As I stood my eye(s) spun (= I became dizzy). [300, (599)]

- (58) Ija ta-taw-igin ija am-i wal-do-i-a
I SIM-stand-1s_DS I eye-1s_POSS spin-3s-3s-TodP

As I stood something caused my eyes to spin. [300, (602)]

- | | | | | |
|------|--------------|-----------------|------|-----------------------|
| (59) | M-i | he-du-me-i | ceta | wal |
| | put-PRED | finish-3s-SS-3s | yam | ripe |
| | me-ce-b | ceta | eu | hun-i-me-i ... |
| | become-DS-3s | yam | that | dig_up-PRED-SS-3s ... |

He finished doing that and then since those yams were ripe he dug them up... [302, (612)]

In chapter 2, we considered and dismissed a possible explanation for the switch-reference facts involving impersonal constructions which was that the switch-reference relation is sensitive to whether or not there is coreference with the Experiencer NP, even though it is not the subject according to the facts of verb agreement, either because it is highest on some hierarchy of semantic roles, or because it is topic.

Before giving the details of my UCG analysis for impersonal constructions in Amele, let me situate the data in question in a broader context by briefly discussing the range of phenomena called 'unaccusative verbs', which were mentioned in 5.4.3.

Jake (1985:ch.6,esp.193,255-7) used the notion of unaccusativity to explain characteristics of the 'subjectless' impersonal construction in Imbabura Quechua. This construction was discussed in chapter 2. It is very similar to the Amele impersonal constructions in that, although the clause may be transitive or intransitive, in either case it will contain an

Experiencer nominal which is marked with Accusative case and which triggers object agreement on the verb, the verb is marked with default third person singular subject agreement, and there seems to be no overt subject. The construction is optional for desiderative predicates and obligatory for physical experiencer predicates, exactly the same range of cases as is covered by the Amele constructions.

Jake's Relational Grammar analysis of subjectless constructions in Imbabura Quechua is that the experiencer nominal is an initial subject NP which loses its status as subject and (eventually) becomes a direct object. Hence her description of them as 'unaccusative' on the basis of the relation between grammatical relations and semantic roles which they manifest at surface structure, as well as other behaviour, involves a use of this term which is less frequently seen, although Perlmutter (1978:179) does discuss such derived unaccusatives, or 'inversion structures'. If we disregard the claim that the experiencer begins life as a subject NP, the main difference from unaccusative constructions familiar from the literature is that the 'theme' object NP does not appear as surface subject, rather the sentence lacks a surface subject. Jake accounts for this by saying that a 'dummy' element is indeed promoted to subject, but that the language is one of those which does not allow dummy elements to be realised by expletives on the surface; the same kind of explanation is given for the subjectless impersonal passives which occur in various languages. See Perlmutter (1978), McCloskey (1984). It is possible to propose just such an analysis for impersonal constructions in Amele.

The failure of an underlying object to move into subject position at surface structure reflects a general lack of subject promotion processes in this language (which also lacks expletive elements). For example, Amele does not have a passive construction which involves promotion of an object argument to subject. However, there is a construction which involves suppression of the subject, which Roberts (1987:220f.) calls the 'pseudo-passive'. In this construction, the subject NP is simply omitted, and the object NP hence occurs in initial 'topic' position. This construction is apparently restricted to 'agentive verbs'. In other words only the agent subjects of such verbs can be omitted. That is, it seems to be restricted to unergative predicates. Default third person subject agreement marking occurs on the verb; i.e. subject agreement is not triggered by the sole remaining NP, instead this NP continues to trigger object agreement marking. See the examples in (60)-(61).

- (60) a. Ija na qet-ig-a
1s tree cut-1s-TodP
I have cut down the tree. [220, (328)]
- b. na qete-i-a
tree cut-3s-TodP
The tree has been cut down; someone has cut down the tree. [220, (329)]
- (61) a. Ija na qet-ad-ig-a
1s tree cut-3p-1s-TodP
I have cut down the trees. [220, (332)]
- b. Na qet-ade-i-a
tree cut-3p-3s-TodP
The trees have been cut down; someone has cut down the trees. [220, (333)]

The Amele 'pseudo-passive' is similar to the kinds of constructions in Dutch, in Romance languages and in other languages which have been called 'impersonal passives' (see Perlmutter 1978: 157-8). These lack overt surface subjects in many languages, and in others have expletive subjects. For example, the Italian impersonal passive (or middle) voice is exemplified in (65).

- (62) a. Gli edili costruiscono le case.
The builders build(PL) the houses. (ACTIVE)
The builders build the houses.
- b. Si costruisce le case.
Si build(SG) the houses. (IMPERSONAL)
The houses are built.
- c. Si costruiscono le case.
Si build(PL) the houses. (IMPERSONAL)
- d. Le case si costruiscono.
The houses si build(PL) (IMPERSONAL)

In the middle construction the verb may agree with the sole remaining NP (the object of

the active) as in (c) and (d), or it may take default third person singular agreement as in (b). The middle marker *si* is a dummy subject with arbitrary reference and is also used in reflexives as in *si rade*, 'self shaves'.⁵⁹

Our account makes the correct predictions about switch-reference marking, because none of the NPs in impersonal constructions, weather expressions or inalienably possessed body part subjects can be designated as *Protagonist* of the eventuality which the clause introduces, since even if we were to analyse any one of them as subject, none have the appropriate value for the AGENTIVE feature, i.e. {+ag}.

In such constructions, I say that the value for the *Protagonist* parameter of the eventuality is a completely unspecified pronominal which is anaphorically linked to none of the DMs introduced by the nominals in the impersonal clause. For clarity of exposition, I will represent this notationally as the discourse marker ARB.⁶⁰ If the previous clause is SS marked, this causes the value of the protagonist of the impersonal controlling clause to share the value of the protagonist of the switch-reference marked clause. If the previous clause is DS marked, the value for the protagonist of the controlling clause remains the unspecified agentive discourse marker ARB, which automatically gives the causal reading.

If the impersonal clause is itself switch-reference marked with respect to a following controlling clause in a clause chain, it is not possible for SS marking to occur when the following clause has a distinct subject. This case is handled automatically, as a result of the asymmetry in the switch-reference relation which prevents the use of SS when the subject referent of a marked clause is contained in the subject reference set of a controlling clause.

This account generalises to handle the examples with inanimate subjects, where as we saw speakers can choose to use SS or DS according to whether they wish to present the subject as agentive or not.

The same kind of account will be given for the pseudo-passive construction, although I could find no examples where such a construction was used in a switch-reference relation.

⁵⁹ The data are from Antonio Sanfilippo, pc.

⁶⁰ This is a slightly different use of ARB from that the GB literature, for example in Chomsky (1981:24). However there is an analogy between the arbitrary interpretation available for the subject of the infinitival clause in *John is annoyed that it is so difficult to get the tyre back on the car*, and the interpretation of the impersonal clause as involving some unspecified agent when DS marking is used.

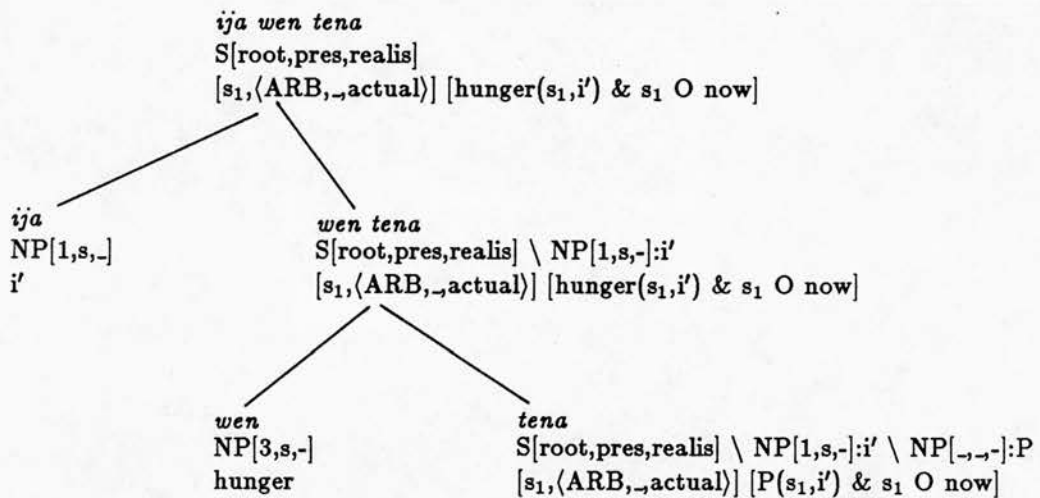
I would predict that if one were, the same kind of behaviour would be observed, with SS marking being used.

Example (63) gives a derivation for the impersonal sentence in (51). Examples (64) and (65) give derivations for (53) and (54) above, where the controlling clause is an impersonal construction, and example (66) gives a step by step derivation for (the full version of) example (57), (57'), where the controlling clause has an inalienably possessed body part subject.

- (51) Ija wen te-na-Ø
1s hunger 1s-3s-pres

I am hungry. [315, (679)]

(63)

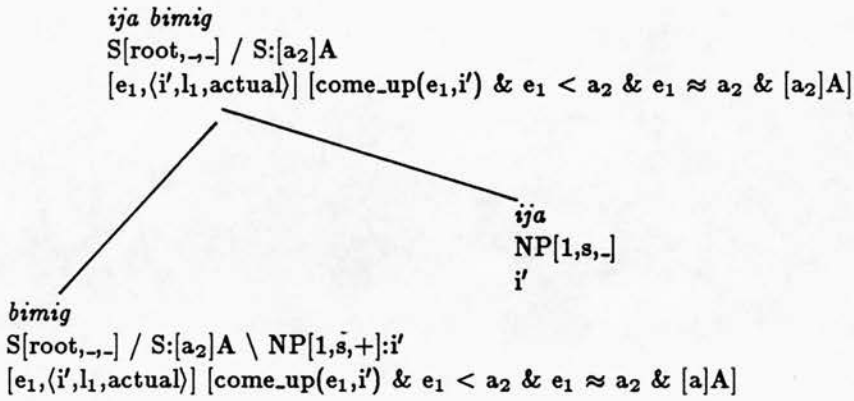


- (53) Ija bi-m-ig wen te-i-a
I come_up-SS-1S hunger 1s-3s-TodP

I came up and I became hungry. [300, (598)]

(64)

STEP 1:



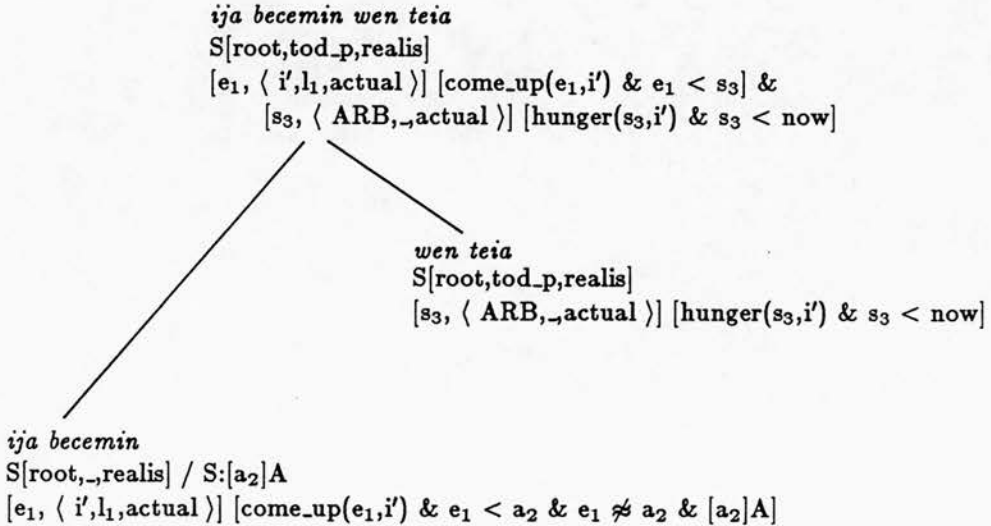
STEP 2:

ija bimig wen teia
S[root,tod_p,realis]
[e₁,⟨i',l₁,actual⟩] [come_up(e₁,i') & e₁ < s₃] &
[s₃,⟨i',→,actual⟩] [hunger(s₃,i') & s₃ < now]

(54) Ija be-ce-min wen te-i-a
I come_up-DS-1s hunger 1s-3s-TodP

I came up, and something made me hungry. [300, (601)]

(65)

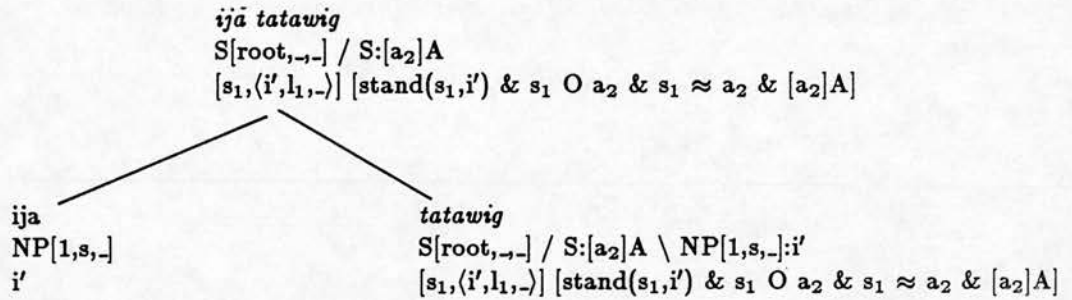


(57') Ija ta-taw-ig na met-i-m-ig
 I SIM-stand-1s_SS wood split-PRED-SS-1s
 am-i wal-do-n
 eye-1s_POSS spin-3s-3s-RemP

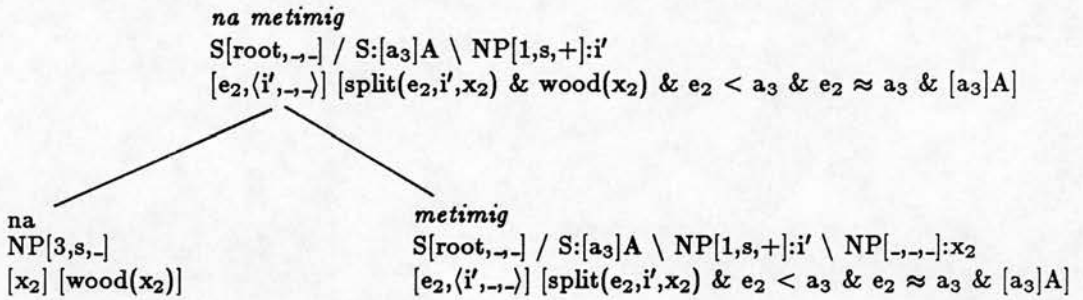
As I stood there splitting wood my eye(s) spun (= I became dizzy). [301, (608)]

(66)

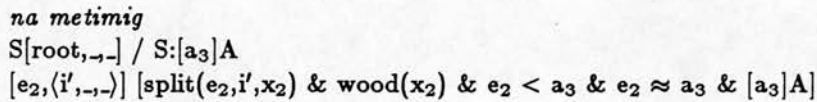
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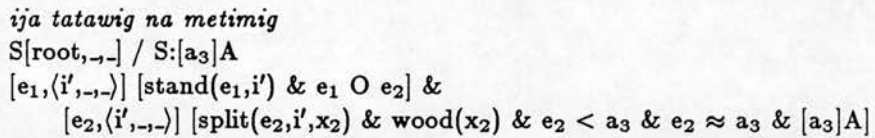
STEP 2:



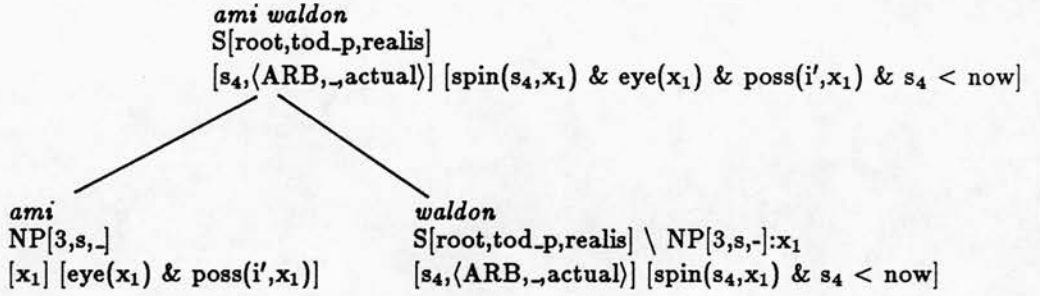
STEP 3:



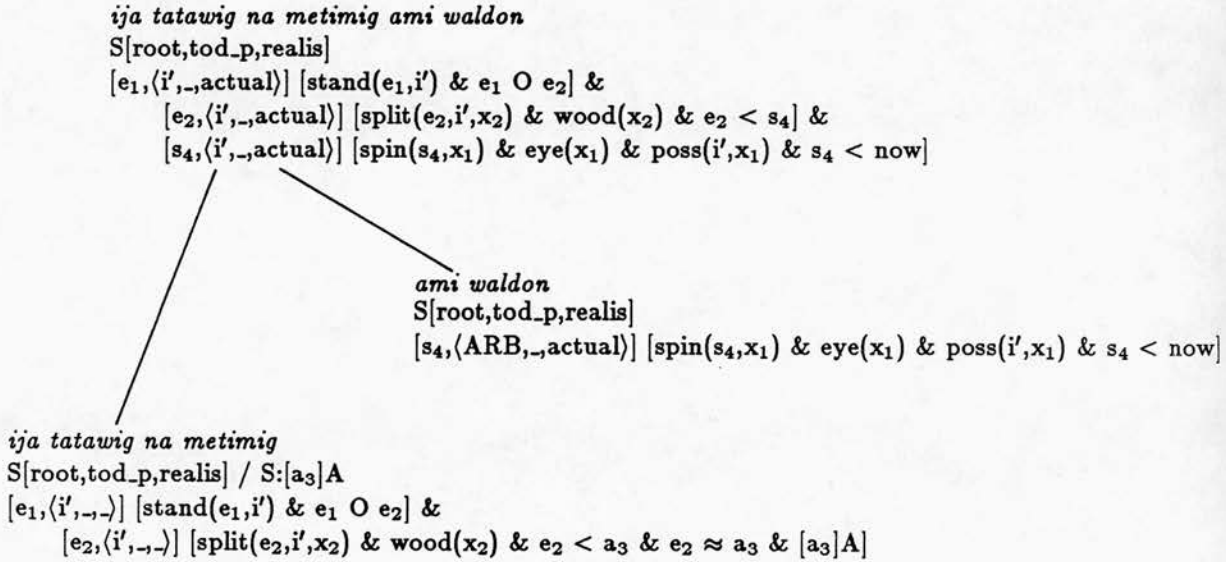
STEP 4:



STEP 5:



STEP 6:



5.6. Generality of the account

The basic account can readily be adapted to handle switch-reference in other languages, whether or not they exhibit functional extensions of the switch-reference system of the kind discussed above and in chapter 2.

For example, to handle switch-reference marking in Imbabura Quechua (see chapter 2), we need the same definition of Protagonist, as agentive subject, but since Imbabura Quechua does not to my knowledge exhibit any functional extensions of DS marking, we can simply define SS and DS marking as putting conditions on the value for the Protagonist parameter of the eventuality indices.

We saw in chapter 2 that in Eastern Pomo, SS marking is used when the subject NPs of the two clauses are coreferential, and share the same agentivity value, as indicated by the morphological form of the pronoun and/or possibly the type of verb in the clause: thus SS marking may be used when the two subjects are both agentive or both non-agentive. DS marking is used either if the two subjects have disjoint reference, or if they have different agentivity values, whether or not they have the same or different reference. Another way to put this is to say that in Eastern Pomo, two eventualities related by SS marking must be of the same aspectual sort with respect to the aspectual distinction for **control** proposed in 5.4.3. To account for switch-reference in Eastern Pomo, we therefore need to include a parameter of control or agentivity in the Parameter list.⁶¹

Again in chapter 2, we saw that in Lenakel, DS marking may be used, even if the two switch-reference pivots are coreferential, if the two clauses differ in that one is future tense and the other is non-future. I propose that the most elegant way to account for this is to see future and non-future tenses as introducing different values for the Actuality parameter, and SS and DS marking responding to both the value for the Protagonist parameter, where this is the DM introduced by the subject NP, and the value for the Actuality parameter: SS indicates that $\text{Protagonist}(a_i) = \text{Protagonist}(a_j) \ \& \ \text{Actuality}(a_i) = \text{Actuality}(a_j)$, and DS indicates that $\text{Protagonist}(a_i) \neq \text{Protagonist}(a_j) \ \wedge \ \text{Actuality}(a_i) \neq \text{Actuality}(a_j)$. Further work must determine whether this analysis of the difference between future and non-future tenses is supported by any other areas of the grammar, and the same qualifications apply as for

⁶¹ It will not do to use the kind of account we have proposed for agentivity in Amele (and Imbabura Quechua), since in these languages agentivity is a constraint on the switch-reference pivot, whereas in Eastern Pomo agentivity value is irrelevant to the selection of the pivot.

Eastern Pomo concerning other potential parameters, in this case of Location and Control.

Finally, we now have a way of modelling the observations made by Woodbury (1983) about switch-reference in Yup'ik Eskimo. He indicated that in this language, there is some pressure towards ensuring continued SS marking throughout any clause sequence which is constituted as a 'rhetorical unit' by prosodic factors, external sandhi, sentence adverbial choice and placement etc. Although more information would be required about the definition of rhetorical units in Eskimo before a proper account could be given, it seems quite likely that the notion of **episode** defined for Amele could be used in such an account.

5.7. Conclusion

Previous chapters have identified three criteria of adequacy for a comprehensive theory of switch-reference. The account presented in this chapter meets all three.

The first, and most important, criterion was that the theory of switch-reference give a principled account for the full range of functions of switch-reference markers, including both referential and non-referential functions. I showed in section 5.4.3 that it was possible to give a unified account of both types of function of the switch-reference markers in Amele by introducing a structured eventuality index which encodes eventuality parameters, and defining an agreement relation between eventuality indices. The information included in the structured eventuality index was selected on the basis of what was required to account for switch-reference in Amele, but in section 5.6 I sketched accounts for the switch-reference systems of other languages exhibiting functional extensions using the same mechanism, and introducing no new parameters (since the parameter of Control used in the account for Eastern Pomo was implicit in the account for Amele, although it had a rather different role there). We also saw that there is some additional support for the choice of parameters from work on transitivity features and on indexicality. I hypothesise first that the structured eventuality index will be found necessary to account for other phenomena besides switch-reference, and secondly that it will prove capable of handling other switch-reference systems which have not been discussed here.

The second criterion was that the theory provide an alternative account for anaphoric relations between switch-reference pivots, to binding accounts based on configurational notions which we saw were unsatisfactory. In this chapter we saw an account which

makes the correct predictions about anaphoric relations between switch-reference pivots without relying on notions of syntactic binding. The switch-reference pivot is selected locally, and in the selection process we are able to take account of not just information about grammatical function but information about agentivity as well. In these two respects the account differs from *Finer's* (1985a, b) Binding Theory account, where the relevant NPs are identified by their position in a complete syntactic configuration.

The final criterion was, that the account could handle the temporal and aspectual meaning encoded in switch-reference morphemes. We saw that this was of two types. In clause-chaining languages, switch-reference morphemes indicate the dependency of marked clauses on final, unmarked clauses for temporal reference and other elements of meaning encoded by verbal inflection. In addition, in many switch-reference languages, the switch-reference system specifies temporal and logical relations between the eventualities which are introduced by the marked and controlling clauses. The account proposed here captures the temporal dependency of the marked clause on the final clause, and the temporal relations between marked and controlling clauses, in a natural and unified way.

Whether or not one takes a strictly Chomskyan approach to Universal Grammar, it would seem plausible to propose that universally, switch-reference is an agreement relation between clauses in terms of their eventuality parameters.⁶² Evidently, languages incorporate different definitions of what it means for eventualities to agree, highlighting different eventuality parameters, however the parameters are ordered hierarchically such that (at least) any language which has switch-reference at all, will define it as a relation of agreement between Protagonist parameters.

⁶² Note that this is a different use of the term 'parameter' from that in the Universal Grammar concept of 'parameter setting'.

Chapter 6 Logophoricity

6.1. Introduction

Logophoricity was introduced in chapter 1, where we tried to establish criteria for deciding whether or not some given set of linguistic phenomena constitutes a switch-reference system. There, we presented data from the African languages Igbo and Gokana, taken from Hyman & Comrie (1981) and Comrie (1983). Hyman & Comrie (1981) identify the Gokana data as a logophoric system, but Comrie (1983:32,36) calls it a 'young switch-reference system'. He thereby draws attention to the similarities between switch-reference and logophoricity, and also raises the possibility of logophoric systems developing into switch-reference systems. In chapter 1, we argued that despite these similarities, and potential diachronic analyses of the data, we should maintain a clear distinction between switch-reference and logophoricity, and analyse the Gokana system as an instance of the latter rather than the former.

Recently, logophoricity has been the focus of renewed interest by linguists, due to analogies which have been drawn between the logophoric systems described for African languages, and the 'non-clause-bounded', or 'long-distance' reflexives, which are found in some Scandinavian languages (Thrainsson 1976, Maling (1984), Barnes 1985, Hellan 1987), and Japanese (Kuno 1972, 1988), and which have also been reported for a wide range of other languages, including Italian (Giorgi 1984), Northern Pomo (O'Connor 1986), Malayalam (Monahan 1982), and the Caucasian languages Chechen and Ingush (Nichols 1985). The basis for these comparisons is that the use of reflexive pronouns with clause-external antecedents seems to be restricted to just those semantically defined contexts in which logophoric pronouns may occur. Work has been done within the frameworks of GB (eg. Anderson 1986) and LFG (eg. Kameyama 1984, Bresnan Halvorsen & Maling (to appear)), and Sells (1987) has proposed a treatment within Discourse Representation Theory.

It therefore seems appropriate at this point to return to the question of how switch-reference and logophoricity are related, and to consider whether it is possible and appropriate to extend the account given in chapter 5 so as to handle logophoric phenomena.

I first give a fuller description of logophoric and long-distance reflexive (LDR) phenomena.

Then I present Sells' (1987) account, and critically evaluate it. In its place I propose an alternative account within Discourse Representation Theory, more particularly within Unification Categorical Grammar. Note that although Sells gives prominence to the African language data in his presentation of logophoric phenomena, he applies his account only to the use of LDRs in Icelandic and Japanese. I discuss some African language data, and in Stirling (1988b) show how the account can be modified to handle the system in Gokana. Finally, I return to the question of the relationship between switch-reference and logophoricity, and show that the account proposed in this chapter is compatible with that proposed in chapter 5.

6.2. Logophoric phenomena

The term 'logophoric' ('returning to the discourse') was created by Claude Hagège (1974) in a paper in which he discussed data from the African languages Mundang, Tuburi, Ewe, and Ubangi languages (such as Ngbaka, Gbandili and Banda). He wrote (287; my translation):

The term 'logophoric' is here proposed to designate a particular category of anaphoric pronouns, personal and possessive, which refer to the author of a discourse or to a participant whose thoughts are reported.

Hagège was also the first to compare the logophoric pronouns in African languages to LDRs, looking at data from Latin and Japanese - a fact which has usually been passed over in more recent work on LDRs.

In the description of logophoric phenomena given in this section, we shall concentrate on the African language data. Most of the examples will be taken from Ewe, a language of the Kwa group which also includes Igbo and Yoruba. The data is from Clements (1975), Duthie (1984), and Westermann (1930). However, much of what is said will also apply to LDR data, and some examples from Icelandic and Japanese will be given, the former taken from Thrainsson (1976), Anderson (1986), Maling (1984), Rognvoldsson (1986), and Sigurdsson (1986), and the latter from Sells (1987).¹

¹ The African languages which have been identified as possessing such systems belong to the Niger-Congo, Bantu, Chadic and Ubangi families, and include: Idoma, Yoruba, Igbo, Avatime, Mundang, Tuburi, Ewe, Mapun, Angas, Sura, Pero, Kera, Akoose, Tikar. In addition to references given in the text, see Frajzyngier 1985, Hedinger 1984, Wiesemann 1982, Stanley 1982.

A clear example of a system which would be labelled uncontroversially as logophoric occurs in Igbo (Hyman & Comrie 1981). See example (1).

- (1) a. ó siri ná ó byàrà
 he_i said that he_j came
 b. ó siri ná yá byàrà
 he_i said that he_i came

In addition to the normal set of personal pronouns, which includes the third person singular form *ó*, there is a logophoric pronoun *yá*. This logophoric pronoun is used to indicate necessary coreference between the subjects of two clauses, where one clause contains a verb of communication such as *say*, and the other is an embedded clause in which the content of the speech is reported. In such a context, use of the normal third person pronoun is normally taken to indicate disjoint reference.²

The term **logophoric context** will be used to refer to the embedded complement clause, and more generally to the syntactic domain in which it is possible to use a logophoric pronoun. The term **logocentric NP** will be used to refer to the matrix clause NP with which the logophoric pronoun is coreferential.

Logophoric pronouns

Logophoric marking takes various forms. Logophoric pronouns may be free forms, as in Igbo, or cliticized to the verb, as in Ewe. See example (2).

² As we shall see below, in some languages the use of a logophoric pronoun is optional, and tied to other meaning distinctions. In such languages the logophoric pronoun always indicates coreference, but a normal third person pronoun does not strictly require disjoint reference.

- (2) a. kofi be yè-dzo
Kofi say LOG-leave

Kofi_i said that he_i left.

- b. kofi be e-dzo
Kofi say PRO-leave

Kofi_i said that s/he_j left.

We also saw in chapter 1 that in Gokana, there is no special logophoric pronoun form, but ordinary personal pronouns are used logophorically by virtue of the appearance of a morphologically invariant logophoric marker suffixed to the verb. See example (3). The basis on which clitics such as occur in Ewe are classified as pronominal rather than as verbal affixes as in Gokana is not clear from the literature.

- (3) a. ae ko ae do
PRO said PRO fell

He_i said he_j fell.

- b. ae ko ae do-e
PRO said PRO fell-LOG

He_i said he_i fell.

Hagège (p.309) notes that Korean seems to exhibit logophoric gapping: omission of a pronoun in a logophoric context such as the complement of a verb of saying indicates coreference, and use of a normal personal pronoun indicates disjoint reference.

In Ewe, there are just two logophoric pronouns, singular *yè* and plural *yèwo*. These are used coreferentially with both third person and second person logocentric NPs. Besides cases where both logophoric pronoun and logocentric NP are plural, cases arise where just one of the two NPs is plural and refers to a set which contains the referent of the other singular NP. Crosslinguistically, where logophoric pronouns enter into anaphoric relationships in which one of the two NPs is plural, the possibilities are extremely constrained. A logophoric pronoun may be used to indicate coreference, if it is plural and refers to a set of entities which contains the singular antecedent - as in example (4) from Ewe.

- (4) kofi kpo be yèwo-do go
 Kofi see COMP LOG_PL-come out

Kofi saw that they (including Kofi) had come out.

The opposite situation does not in general appear to be possible; i.e. a singular logophoric pronoun may not have a plural antecedent, regardless of whether or not the set referred to by the plural NP includes the referent of the singular pronoun. However, such a situation is said by Frazyngier (1985) to occur in Mapun, a Chadic language.

Normally logophoric pronouns may be used in any grammatical function in the embedded clause, including subject, object and possessive pronoun. In addition to number distinctions, languages may have separate forms of the logophoric pronoun for different grammatical functions - especially personal versus possessive. For example, Mundang distinguishes between a possessive form and a nonpossessive, with the latter able to have any other grammatical function within the embedded clause. Some Ubangi languages apparently have separate forms for subject, direct object, indirect object, alienable and inalienable possession, paralleling non-logophoric pronouns (F. Cloarec-Heiss 1969, referred to by Hagège 1974:304f.).

Some person distinctions are also made. It is reported that at least one of the Ubangi languages studied by Cloarec-Heiss distinguishes first person as well as second and third person forms in the possessive form of the logophoric pronoun (Hagège 1974: 304). However, this is the only report I have seen of a logophoric pronoun with a first person form, and Hagège gives no examples: mostly, logophoric pronouns are identified as third person, with, more rarely, second person forms also occurring.

In languages with long-distance reflexives, these have the same form as clause-bound reflexive pronouns. Thus, in Icelandic, this is the special reflexive form which exists for the third person and which is invariant for number and gender, but has different case forms: accusative *sig*, dative *ser* and genitive *sin*. There is no nominative form and so Icelandic LDRs only appear as subjects when the subject takes 'quirky case' assigned by the verb (see Levin & Simpson 1981, Zaenen & Maling 1984).

In Japanese, the invariant form *zibun* occurs as LDR. Examples from these two languages will be seen later.

In African languages with logophoric pronouns, clause-bound reflexive pronouns also exist which are completely morphologically distinct. As we shall see, it is clear that the distribution of logophoric pronouns and of LDRs must be accounted for using similar means. However, we cannot collapse the two phenomena completely. Besides the obvious distinction in that LDRs are closely related to clause-bound reflexives whereas logophoric pronouns are not, note also that whereas logophoric pronouns may be used to refer to some set of which the logocentric NP referent is a member, reflexives always have the stronger requirement of identical extensions.

Direct and indirect reporting

Logophoric pronouns are identified as (usually) third person, on the basis that logocentric NPs are (usually) third person; that is, because logophoric pronouns are coreferential with these NPs, they are taken to agree with them in person and other grammatical features. Thus, logophoric systems are said to be motivated by the ambiguity which otherwise arises in sentences such as English *John said that he went home*, where the *he* can refer to John or to some other third person.

The appropriate feature specification for logophoric pronouns is not a trivial question, however. It is somewhat misleading to analyse logophoric pronouns as third person. The reason this position has been taken in much of the literature is on comparison with English translations which usually use indirect reporting. However, logophoric contexts in many languages behave exactly like direct reported speech, except in that a logophoric pronoun occurs instead of a first person and/or second person pronoun. That is, all other pronouns which occur are those which would have been used in the original utterance, temporal deixis is unchanged, etc. In such languages logophoric pronouns therefore seem to have 'dual status': they are both anaphorically linked with an antecedent in current speech, and acting 'deictically' in the reported speech, with respect to the original speech context. The logophoric context is thus something between direct and indirect speech as we usually understand them. In such languages, it is more plausible to regard logophoric pronouns as complementary with first person pronouns. The choice between a logophoric and an ordinary first person pronoun allows the distinction between the actual speaker and the reported speaker to be maintained. Thus it is better to see logophoric systems as motivated by the need to disambiguate sentences such as English *John said I went home*, where *I* is ambiguous between reference to the current speaker and reference to John. Logophoric pronouns are the form the first person takes in reporting the speech of anyone but oneself.

This explains why it is almost unknown for a first person logophoric pronoun to occur.³

This is the case in Mundang, and in Ewe there is no apparent distinction between direct and indirect speech. In Mundang, logophoric pronouns are singular, and cannot have plural antecedents: if reference is to a set, even to a set all of whom are the reported speakers of the reported speech, the regular plural form of the first person pronoun is used. Hagège reports that there is no ambiguity of the kind found in spoken English *The boys said we went home*, because any first person plural form appearing after a verb of saying belongs to the reported speech and can't include the current speaker.

Analysing logophoric pronouns as in some sense first person has the further advantage that it better conforms to Silverstein's (1976) person hierarchy, which ranks the persons as 1st > 2nd > 3rd: we can make the generalisation that the further towards the left an element occurs, the more likely it is to have a special logophoric pronoun within the logophoric context. Silverstein also presents evidence that number is relevant to ranking on the hierarchy, which may explain the Mundang system.

Logophoric context

The logophoric context is defined as that domain in which it is possible to use a logophoric pronoun. The central use of logophoric pronouns crosslinguistically is within clausal complements of verbs of saying. However, many languages do not restrict the use of logophoric pronouns to this context. If a language further generalises its range of logophoric contexts, it will do so according to the following implicational universal hierarchy. Verbs which introduce logophoric contexts in the form of their clausal complements are called **logocentric verbs**.

³ Hagège (1974: 294, etc.) and Westermann (1930:60-1) adopt the position that logophoric pronouns are the form the first person takes in reported speech, but in general the importance for logophoricity of an account of direct and indirect speech has been ignored in most of the literature. For example, Sells (1987) takes many of the examples he quotes from Hagège, but he actually gives the wrong glosses in many cases, interpreting what is clearly direct reporting in Hagège (1974) as indirect speech (for example, Sells' (1a,p.446) vis-a-vis Hagège's (4,p.292)). An account of direct and indirect speech may allow a unified interpretation of first person pronouns and logophoric pronouns. However, logophoric pronouns are used in indirect speech contexts in some languages. There is no scope to explore these issues here, and in the account proposed below I find it most efficient to analyse logophoric pronouns as having the person feature $-\text{[1]}$.

Logocentric Verb Hierarchy:

communication > thought > psychological state > perception

That is, it is claimed that in any logophoric language, if verbs of one kind trigger a logophoric context, then so will verbs of the kinds to the left of it on the hierarchy.⁴ Some languages, such as Igbo, restrict logophoric contexts just to verbs of communication, and some, such as the Chadic language Mapun, just to the verb 'say'. Others allow all four types of verb, such as Ewe. Mundang allows only verbs of assertion, verbs of ordering, and more rarely, verbs of thinking. Tuburi excludes only verbs of perception. Note that the hierarchy includes verbs of propositional attitude, but is not restricted to them; nor do they have a privileged position in any way.

The logophoric context is often introduced by a 'report opening' complementiser. For example, in Tuburi, the complementiser *gā* always introduces the logophoric context, and in Icelandic the complementiser *ad* is required. In Mundang, the complementiser *se* optionally occurs. Such complementisers are often historically derived from a verb 'say', in a process which has been well documented for African languages by Lord (1976). This seems to be the case in Tuburi.

Logophoric contexts, as well as allowing the use of logophoric pronouns, and possibly requiring a special complementiser, may have other characteristics. For example, it is common for verbs in a logophoric context to require subjunctive mood. Coulmas (1985:14,21 etc.) points out that use of subjunctive mood is a common way to indicate indirect speech. This requirement is best documented for Icelandic (see Thrainsson 1976, Anderson 1986 etc.), but also apparently is true of Italian (Giorgi 1984) and Ewe (Duthie 1984). In Ewe, the set of logophoric contexts includes purpose clauses introduced by a complementiser *be* and containing a verb in the subjunctive form marked by *-a-* (glossed by Clements 1975 as the 'atelic' marker); the clause implies future possibility. There may also be constraints on tense. Anderson (1986) bases his account on the observation that in Icelandic, indicative, non-logophoric subordinate clauses may have different tense from the matrix clause, but subjunctive, logophoric subordinate clauses almost always have the same tense as the main clause.

⁴ There may be lexically determined exceptions within some type of verbs which are generally allowed, for example Icelandic allows nonfactive verbs of communication, thought and psychological state but native speakers vary in their acceptance of semifactive verbs belonging to these groups, such as 'know'.

Languages may further extend the range of logophoric contexts if these become grammaticised in some way. Usually what happens is that the 'report opening' complementiser, which introduces the embedded clause constituting the logophoric context, has its distribution extended beyond complements of verbs of communication, thought, psychological state or perception. Thus, in Tuburi, $g\bar{a}$ forms part of the relative clause marker $ma:g\bar{a}$, where $ma:$ is a complementiser used in nominal determination as well as the relative. Logophoric pronouns are thus licensed in relative clauses, which is not possible in other logophoric languages. Also in Tuburi, the complementiser may occur by itself, with the matrix logocentric verb omitted, in which case it seems that $g\bar{a}$ itself carries the force of a verb of saying.

Grammaticisation of this kind has also occurred in Ewe. In Ewe, the form *be* is homophonous between the verb 'say', and the complementiser 'that'; these may not co-occur, and the complementiser is clearly derived from the verb historically. Either use of *be* may introduce a logophoric context. Logophoric contexts in Ewe thus comprise:

- (i) clausal complements of the verb 'say';
- (ii) clausal complements of other logocentric verbs, of communication, thought, psychological state and perception; these are obligatorily introduced by the complementiser *be*;
- (iii) other clausal complements introduced by *be*, all of which express future possibility.

In Japanese, too, it is possible to introduce a logophoric context not just by a logocentric verb but also via complementiser *node* 'because'. We can see this complementiser as involving implicit logophoricity (the subject of the preceding clause does something for a reason), in contrast with the purely temporal complementiser *toki* 'when' which cannot introduce a logophoric context. See example (5).

- (5)
- | | | | | | |
|---------------------|-----|---------|------|----------|---------|
| Takasi _i | wa | [Yosiko | ga | mizu | o |
| Takasi _i | TOP | [Yosiko | SUBJ | water | OBJ |
| zibun _i | no | ue | ni | kobosita | node] |
| self _i | GEN | on | LOC | spilled | because |
- nurete-simatta
wet-got
- Takasi_i got wet because Yosiko spilled water on him_i.

We have seen two ways of introducing logophoric contexts, and can generalise over these by using the term **logocentric trigger** to refer to that element which introduces such a context: either a logocentric verb or a report opening complementiser; sometimes both may occur. So the logophoric context is that domain which falls within the scope of the logocentric trigger.

Apart from the way they are introduced, the main parameter of variation for logophoric contexts is whether they are constrained to be local to the logocentric trigger, or whether it is possible for them to extend over an arbitrarily long stretch of discourse following the use of a logocentric trigger. Mundang is a language of the first type; it requires the logocentric trigger to be local, usually in the preceding clause (i.e., the matrix clause). However, most logophoric languages are of the second type.

Note that in particular, in languages other than Mundang, any clausal modifiers which form part of the clausal complement of the logocentric verb, for example relative clauses, may contain logophoric pronouns - even though when not embedded under a logocentric verb, they cannot do so. Compare the ungrammatical examples from Ewe in (6), which would be grammatical with the personal pronoun *e*, meaning 'him', replacing the logophoric pronoun, with the examples in (7) in which the same clauses are embedded under a logocentric verb.

- (6) a. *ama do nku nyonuvi hi
 Ama set eye girl REL
- dze yè gbo dyi
 stay LOG side on
- Ama remembered who was the girl who stayed with her.

- b. *kofi se koku wò
 Kofi hear Koku PRO/he
- le yè dzu-m
 be LOG insult-PROG
- Kofi heard Koku insulting him.

- (7) a. ama gblo be yè-do nku nyonuvi
 Ama say COMP LOG-set eye girl

hi	dze	yè	gbo	dya
REL	stay	LOG	side	on

Ama_i said that she_i remembered the girl who stayed with her_i.

b. kofi gblo be yè-se koku wò
 Kofi say Comp LOG-hear Koku PRO

le	yè	dzu-m
be	LOG	insult-PROG

Kofi_i said that he_i heard Koku insulting him_i.

The logophoric context may even extend across sentence boundaries. Usually in such cases it is maintained through continuing use of a report opening complementiser, as in Ewe, or subjunctive mood, as in Ewe and Icelandic, or by special syntactic constructions such as the inversion structures of Icelandic exemplified in (8).

Thus, in Tuburi, it is possible within a reported-narrative context for logophoric pronouns to occur throughout the long text, to indicate coreference with an original antecedent which may be many sentences back. Unlike in Ewe, just one occurrence of the complementiser *gā* is necessary to introduce a logophoric context. Hagège (1974:298) gives a nice example:

It is also noteworthy that the introductory (i.e. logocentric) verb, contrary to the usage in Mundang, may only be used once at the beginning, so that logophoric pronouns appear in utterances very far from this verb in the temporal progression of the discourse. Thus, an old informant, relating to us the origin of his clan, told us, thirty minutes after the initial passage, which contained an introductory verb ('My elders taught me that ...'):

sā:rā	dús	sō
LOG	scattered	thus

They thus scattered.

Example (8) is from Icelandic, quoted by Sigurdsson (1986:12); here too the antecedent for the long-distance reflexive may be in a previous sentence.

(8)	formaðurinn _i the-chairman _i	varð became	óskaplega furiously	reiður. angry.	tillagan the-proposal
	vaeri was(S)	avívirðileg outrageous	og and	vaeri was(S)	henni it
	beint aimed	gegn at	sér _i self _i	persónulega. personally.	Ser REFL _i
	vaeri was(S)	reyndar in_fact	sama indifferent	

In fact, he did not care

Another example is given by Maling (1984:239n.27), and for examples from Japanese and Ewe see Sells (p.455) and Duthie (1984) respectively. The inversion structure (in bold) shows that the speaker is 'taking the part' of the internal protagonist (it is translated as something like 'It was aimed at him personally, he expressed'). Note that the subjunctive mood on the intervening verbs is important in preserving the character of the indirect discourse.⁵

The logocentric NP

The logocentric NP is a subcategorised for argument of the logocentric verb or of the verb immediately preceding the report opening complementiser. It is almost always the subject of its clause, however it may be some other argument, provided this argument is the 'source' of the reported proposition - the speech, thought, or psychological or perceptual experience. Example (9) is from Ewe and example (10) from Japanese; examples from

⁵ In the restricted case described in literary theory analysis of direct and indirect discourse as 'style indirect libre' or 'represented speech', (Coulmas 1985:7), the referent of the logophoric pronoun may not be explicitly referred to at all, but just understood from the context, as the source of the mental, emotional or experiential content being reported. Most of these examples are unusual more for not specifically predicating the role of source of this understood referent; usually the referent has been introduced into the discourse previously. Sigurdsson (1986:13-4) quotes such an example:

Maria var alltaf svo andstyggileg.
Maria was always so nasty.

pegar Olafur kaemi segdi hun ser areidanlega ad fara.
when Olaf_i came(S) told(S) she self_i certainly to leave
'When Olaf would come she would certainly tell *him* to leave.'

Tuburi are given in Hagège (1974).⁶

- (9) e dzo dyi na e be yè
 that swell heart for she COMP LOG

a dyi vi
SBJV carry child
She_i is happy that she_i will bear a child.

- (10) [Yokiso ga zibun_i o nikundeiru koto]
 [Yosiko SUBJ self_i OBJ be-hating COMP]

' ga Mitiko_i o zetuboo e oiyatta.
SUBJ Mitiko_i OBJ desperation to drove

That Yosiko hated her_i drove Mitiko_i to desperation.

It is most usual for the relevant constraint on the logocentric NP to be just that it bears the semantic role of 'source'. However, in Japanese the constraint is more liberal. The antecedent for the reflexive *zibun*, in its 'long-distance' use, must be either a grammatical subject (even if not source) or the source argument of a logocentric verb (even if not subject). In contrast, in Icelandic, a more restrictive constraint is in operation. The antecedent for the LDR must be both subject and source, and non-subject sources may not be antecedents. These differing constraints mean that languages differ as to whether passive versions of logocentric predicates may introduce logophoric contexts: in Japanese they may, but in Icelandic they may not, because the subject is no longer source, and the available source is no longer subject. Hence example (12) is ruled out; cf. the Japanese example (14).

- (11) Hann_i sagdi [ad sig_i vantadi hafileika].
 he_i said [that self_i lacked ability].

He_i said that he_i lacked ability.

⁶ In some logophoric systems, the relevant argument in the matrix clause is not the subject/source, but the addressee of the reported speech (etc.). Two types of case occur. In one, there is a special form of the logophoric pronoun for this type of coreference, in addition to the ordinary logophoric pronoun already described. This is what happens in Mapun, a Chadic language (Frazyngier 1985). In some languages, however, it is just the addressee argument which is important: there is no logophoric coreference to the subject/source. This is the case in another Chadic language (Frazyngier 1985).

- (12) *Honum_i var sagt [ad sig_i vantadi hafiðleika].
 he_i was told [that self_i lacked ability].

He_i was told that he_i lacked ability.

- (13) Takasi_i wa Taroo ni [Yosiko ga zibun_i
 Takasi_i TOP Taroo DAT [Yosiko SUBJ self_i
 o nikundeiru koto] o hanasita.
 OBJ be-hating COMP] OBJ told

Takasi_i told Taroo that Yosiko hated him_i.

- (14) Taroo_i wa [Yosiko ga zibun_i ni
 Taroo_i TOP [Yosiko SUBJ self_i OBJ2
 aitagatteiru to] iwareta.
 visit-was-wanting COMP] was-told

Taroo_i was told that Yosiko wanted to visit him_i.

We shall return to the notion of source below. For now, note that although from what has been said it is clear that the concept of 'source' of reported speech or mental experience is important, we must nevertheless deal with examples such as (15), from Ewe, which are common in logophoric languages: here the matrix verb is negated, so that strictly speaking one could not speak of Kofi as being a 'source' (it is asserted that he is not), yet use of the logophoric pronoun is still possible.

- (15) a. kofi nya be me-kpo yè
 Kofi know COMP PRO-see LOG

Kofi_i knew that I had seen him_i.

- b. kofi me-nya be me-kpo yè o
 Kofi not-know COMP PRO-see LOG

Kofi_i didn't know that I had seen him_i.

Further, it is not sufficient that the logocentric NP refer to the origin of the information; some intention to communicate is usually required. This is shown for Icelandic by the contrasting examples (16) and (17). These examples are also negated.

- (16) *barnið_i bar bess ekki merki [að bað
 child_i-the bore it not signs [that there

 hefði verið hugsað vel um sig_i].
 had(S) been thought well about self_i]

The child didn't look as if it had been taken good care of.

- (17) barnið_i lét ekki í ljós [að bað
 child_i-the put not in light [that there

 hefði verið hugsað vel um sig_i].
 had(S) been thought well about self_i]

The child_i didn't reveal that it_i had been taken good care of.

Optionality of logophoric pronouns

In many languages, given a logophoric context in which there is coreference with the logocentric NP, speakers may choose to use a logophoric pronoun or to use an ordinary personal pronoun. Such a choice is not possible in Mundang, but is possible in all the other languages we shall have occasion to consider. In such cases the appropriate choice between subjunctive and indicative mood, if relevant, must also be made.

In all the languages in which such a choice is possible, it is associated with a meaning distinction of a remarkably consistent kind: if the ordinary pronoun is used, it indicates that the speaker has assimilated the proposition being reported into her own scheme of things, and accepts its truth and/or approves of its content: If the logophoric pronoun is chosen, it indicates that the speaker has not assimilated the proposition into her knowledge base, and does not necessarily accept its truth or approve of its content: in some sense, responsibility for its truth or content is distanced, and left to the referent of the logophoric pronoun. That is, the optionality of logophoric reference allows the speaker to express her attitude to the truth of what she reports - and logophoricity must thus be seen as part of the evidential system of the language. As we shall see below, choice between logophoric and nonlogophoric pronouns, and choice of mood, are both to be seen as the result of a prior choice at the semantic/functional level, in how the proposition is to be presented.

I shall give an example just from Ewe, but exactly parallel examples are given for Tuburi by Hagège (1974), and for Japanese by Hagège (1974) and Sells (1987), based on original

examples from Kuno (1972) and Kuroda (1973). In Icelandic, use of an LDR plus subjunctive mood is also optional and seems to be associated with a similar meaning distinction, but examples are harder to find due to the fact that mood is rather rigidly lexically determined. See the example in Maling (1984:212).

Example (18), from Ewe, is equally grammatical with the logophoric pronoun (as it stands), or with the pronoun *wò* replacing it, according to whether the current speaker herself assumes the reality of the event reported in his own discourse, or simply presents it as assumed in the discourse of the reported speaker. Westermann (1930, 61) says that at that time the 'rules' (i.e. for using logophoric pronouns) were sometimes not observed 'in modern speech' - instead he found the pronoun of the main clause would be repeated in the subordinate clause; this suggests that the optionality of the logophoric pronoun with this meaning difference is a historical development of an earlier more rigid system.

- (18) e nyo na ama be ye a dyi vi
 that is good Ama COMP LOG SBJV bear child

It pleases Ama that she is with child.

Note that the embedded clause in (18) represents future possibility: literally, 'she will bear a child'.

6.3 Accounting for logophoricity within DR Theory

There has been considerable discussion in the literature about whether the distribution of logophoric anaphors should be handled syntactically or semantically; for example Thrainsson (1976) argues for the latter, Anderson (1986) seeks a purely syntactic explanation, and Maling (1984) argues for a partly syntactic and partly semantic account. As we shall see, syntactic binding accounts seem doomed to failure, and Maling (1984), Sigurdsson (1986) and Rognvaldsson (1986) show that a syntactic account along the lines of Anderson's (1982) also fails. Given that both structural and semantic constraints are involved to some extent, the question remains how far and in what way the semantic constraints can be brought into the formal account.

The relationship between a logophoric pronoun or LDR and its antecedent logocentric NP is clearly an anaphoric relation, with the possible exclusion of the 'style indirect libre'

cases. However, it is difficult to find a place for logophoric pronouns within the range of possibilities provided by the Binding Theory of GB. Logophoric pronouns are not 'anaphors' in the technical sense of the Binding Theory, since they occur optionally, and they contradict the principle that an anaphor must be bound in its governing category, at least if we define 'governing category' in configurational terms. The structural relation of c-command need not hold between the NPs so related (see Maling 1984), and even if we depart from c-command and redefine governing category in terms of lexical government, we still face the problem that logophoric anaphora can cross sentence boundaries. Not only is syntactic binding not a necessary condition, however; it is also not sufficient. As we have seen, the logocentric NP is commonly semantically constrained to have a 'source' role, and we shall see later that it must also be a definite NP. According to Maling (1984), logophoric pronouns may not have split antecedents, and the relation between anaphor and antecedent cannot cross speakers. Given this and the possibility of grammaticisation of logophoric contexts, we must recognise that in some languages there are some structural constraints on the distribution of such pronouns. This means that they lack the freedom of reference which characterises 'pronominals' as defined by the Binding Theory. Logophoric systems also contradict the principle that a non-anaphor cannot be bound in the same domain as an anaphor. Finally, as in Dogrib (Saxon 1984), we once again need a way of stating a requirement of disjoint reference on nonlogophoric personal pronouns in logophoric contexts.

Approaches within DR Theory have proved very successful in handling cases which apparently involve binding but where neither syntactic nor logical definitions of binding relations have been helpful: the 'donkey sentences' (Kamp 1981a, Heim 1982); reference within quantified contexts (Stirling 1985b); and reference within modal contexts (Roberts 1986, Stirling 1988a). In the first instance, the DR Theory account succeeded due to its treatment of the existential and universal quantifiers, in particular by treating existential quantification as resulting from the definition of embedding rather than present in the semantic representation. In the other two cases, DR Theory succeeds by virtue of the notion of a Discourse Representation Structure, which allows one to define semantic contexts intermediate between the representation for a sentence and the representation for an entire discourse, and thus offers an alternative level of representation at which to account for binding-like relations.

Therefore, a DR Theory account for logophoricity would appear to offer a potential solution to the problems identified above. Such an account has been proposed by Sells (1987), who claims that it is 'the beginnings of a formal construction of the fundamental

aspects of logophoricity' (p.445). I shall give a brief outline of his account, raise a number of problems with it, and then propose an alternative DR Theory account.

Although the first part of his paper is concerned with work on logophoricity in African languages, Sells goes on to base his account almost entirely on long-distance reflexives data from Icelandic and Japanese. His account is presented as an amalgam of ideas from other work drawn together within the 'wider theory of anaphora' (p.446) afforded by DR Theory; the work he draws on, from Banfield (1982), Kuno and Sigurdsson, also concentrates on LDRs, and the key element of these analyses is that they propose a feature [+log] which is specified on particular NPs (LDRs, or logophoric pronouns) by logocentric verbs.

Sells incorporates this basic idea into the version of DR Theory described in Kamp (1981a) (see also chapter 4). He extends this version of DR Theory in three ways. First, he needs to introduce two new kinds of Discourse Marker (DM): propositional DMs (*p*, *q*, ...) to stand for clauses embedded under verbs of saying, and an ad hoc DM (*S*) representing the speaker of the discourse and added to the top level of the DRS. The latter is analogous to including a DM for the time of speech ('now'), as is done in extensions of DR Theory to handle tense and events.

The final and most important extension to the theory that Sells proposes is a new kind of condition which encodes information about semantic or discourse roles. As we saw in 6.2, the idea that the 'source' of the communication is relevant for determining logophoricity is not a particularly new one. Sells defines a set of three primitive predicates, see (19). These result in a new type of condition, which is introduced into a distinguished part of the DRS. The DM of which the primitive is predicated is then available to be anaphorically related to other entities in the discourse, with the result that any one of the roles can be indirectly predicated of either the DM introduced for the speaker, or of some discourse-internal referent. Sells claims that logophoric phenomena are the result of the interaction of these three more primitive notions.

(19)

SOURCE = 'the one who makes the report'; 'the intentional agent of the communication'.

SELF = 'the one whose 'mind' is reported'; 'the person with respect to whose consciousness or 'self' the report is made'; 'the one whose mental state or attitude the content of the proposition describes'.

PIVOT = 'the one from whose (physical) point of view the report is made'; 'the centre of deixis'; 'the one whose shoes are literally being stood in'; 'the one with respect to whose space-time location the content of the proposition is evaluated'.⁷

The SELF and PIVOT thus represent two aspects of 'point of view': the mental and the physical.

As is assumed by most work on logophoricity, verbs in a language may be lexically specified for determining that their subjects may be antecedents for a logophoric pronoun. The way this is formulated in Sells' account is that logocentric verbs have the effect of adding certain conditions to the DRSs representing their complement clauses. These conditions predicate each of the three roles, source, self, and pivot, of a discourse marker: often the DM associated with the subject of the main verb. A logophoric pronoun then receives its interpretation via these predicates: the discourse marker introduced for the logophoric pronoun is linked anaphorically to the discourse markers predicated of the three roles. In other words, a logophoric pronoun is linked to some NP in virtue of the fact that the NP is associated with a particular role. (In fact, it is the DM of which the 'pivot' role is predicated which is actually chosen as the antecedent, for reasons of uniformity (459) though arguably the complex of predicates, or the highest on the hierarchy, would be a better option.)

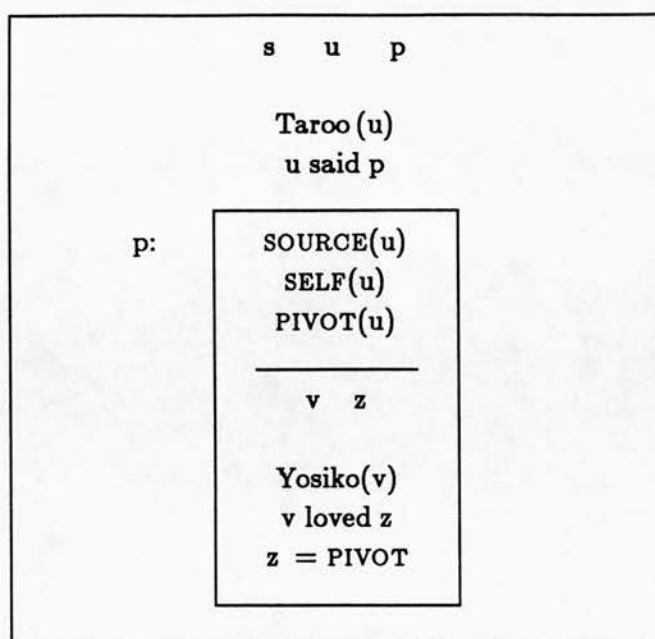
The following DRS, then, would be the representation given for the Japanese example in (20).⁸

- (20) Taroo_i wa Yosiko ga zibun_i o aisiteru to itta.
 Taroo_i TOP Yosiko SUBJ self_i OBJ loved COMP said
 Taroo_i said that Yosiko loved self_i.

⁷ Quotes are from Sells.

⁸ Sells uses the symbols σ , ϕ and Θ for the SOURCE, SELF and PIVOT respectively; for notational convenience and clarity, I shall replace these symbols with the lexical items.

(21)



In this case, all three roles are assigned to the subject of the embedding predicate. That is, Taroo is the source of the report, the person whose mental state is described, and the locus of deixis. This is the representation given to verbs of communication and propositional attitude, which Sells calls 'logophoric predicates'.⁹

Not all possible combinations of reference assignment to the three predicates are recognised; the full range is listed in the table below, where 'external' means the role is assigned to the current speaker, and 'internal' means that the role is assigned to some internal protagonist in the discourse.

	I	II	III	IV
SOURCE	external	external	external	internal
SELF	external	external	internal	internal
PIVOT	external	internal	internal	internal

⁹ It is not clear that the condition $z = PIVOT$ is well-formed, since anaphoric conditions of this kind usually link terms and here a term is linked to a predicate.

Hence, four discourse contexts are defined. Context I is direct speech; this is the default setting. Sells' account implies that *all* DRS's will have specification for each of the three roles, and for most of them, this will be the setting. Context IV is the context for what Sells calls 'logophoric verbs'; these are however just verbs of communication and propositional attitude. The claim is that logophoric pronouns may only be used when the speaker is identifying completely with an internal protagonist. Context III is the context of 'psychological verbs', where the claim is that these are distinguished from the verbs of communication in that the current speaker is the SOURCE rather than the internal protagonist, who does however have SELF and PIVOT roles. Finally, context II, where only the PIVOT role is predicated of some entity other than the current speaker, is said to be the context of '3rd person point of view'.

Sells claims two main advantages for his account. The first is that (in contrast with the accounts he draws on) it gives some content to the feature [+log]. Presumably this content consists of the requirement that any NP marked with this feature will result in the insertion of a condition in the DRS which will associate its discourse marker with the PIVOT role and therefore with the discourse marker of which 'PIVOT' is predicated. This in turn will be linked to the subject of the higher DRS by virtue of the conditions imposed by the logocentric verb.

The second claimed advantage is that his account makes a number of predictions and accounts for other phenomena as well. There are two main types of example given in support of this claim.

First, his account is claimed to make predictions about the facts of anaphora, in virtue of it being embedded within a formal semantic framework. That is, it is supposed to capture certain other, 'anaphoric', aspects of interpretation relevant to logophoricity, eg. the Japanese pronoun *zibun* is sometimes ambiguous between a bound-variable and a referential interpretation, and this is predictable from the discourse structure.

Second, and more importantly, the primitives he introduces, are claimed to explain the distribution of evaluative expressions such as *that idiot Mary*, *beloved Mary*, and *mysteriously*.

Evaluation of Sells' account

There are a number of problems with Sells' account.

First, it lacks generality. We have already noted that, although he gives the impression that he is making general proposals about logophoric phenomena, he actually restricts his attention to the long-distance reflexives, and neglects to show how it can be generalised to the more central cases of logophoricity represented in the African languages. In particular, it is unclear from his paper whether or not he takes the whole gamut of machinery he introduces - semantic primitives of SOURCE, SELF and PIVOT, etc., - to be necessary to account for the African phenomena.¹⁰

Furthermore, his account fails to capture the generalisation that in African languages, and also in LDR languages, his 'psychological' and 'logophoric' predicates behave the same way. Sells does not give any account for why or how subjunctive mood is associated with logophoricity in those languages in which it is, or for the optionality of logophoric pronouns, nor does he address the question of the relationship between LDRs and clause-bound reflexives in any serious way.

Second, the account lacks technical specificity. Sells presents a DR Structure analysis, but completely fails to specify the algorithm from syntactic structures to DRSs, and the semantic interpretation of the machinery he introduces. This leaves us speculating about what his treatment for the syntactically different types of clauses would be, what semantic interpretation is to be given for the roles introduced, in what sense they differ from other predication conditions (as they clearly do, since they are put in a special part of the DRS), and what kind of definition of logophoric pronouns he gives in order to capture the 'content' for the [+log] feature which he claims to provide. Finally, he does not incorporate a treatment of tense and events into his account.

It is perhaps due to the latter that a problem with the status of the propositional discourse

¹⁰ He justifies this (p.475):

It would be inappropriate to say too much about the African languages discussed in section 1, in the absence of certain crucial information; but (...) it does not seem unreasonable to suggest that the criterial feature of true logophoric pronouns is SOURCE-orientation. These really are, then, pronouns that occur in contexts of indirect discourse.

It is a fair point to be cautious in dealing with data from languages of which one has no access to native speaker informants; however, I think we can at least start to examine some of the African data.

markers arises. These seem to be a reasonable way of representing the content of clauses embedded under verbs of propositional attitude, but Sells generalises their usage to other kinds of embedded clauses where there is much less motivation for them. In particular, he uses them to represent clausal complements of psychological predicates such as *distress*, as in the example *That Yosiko was following her distressed Mary*. We might imagine the embedding condition for the propositional DM here to be something like: 'there is some proposition such that it distressed Mary'. But is it really a proposition which is distressing Mary, or is it rather an event?

Sells does indicate that the introduction of the additional machinery he proposes will proceed along the following lines. -

1. Any 'top' DRS for a discourse will have a DM *S* representing the speaker of the discourse. This will of course be accessible to any embedded DRS within it.
2. Any DRS will incorporate three conditions, predicating the three roles of SOURCE, SELF, and PIVOT of a DM representing either the speaker, or some 'internal' protagonist. The default will be for all three to be assigned to the external speaker: i.e., the default discourse context is 'direct speech'.
3. Apart from this, certain verbs will be specified in the lexicon as setting up the three role conditions differently from the default.

PSYCHOLOGICAL VERBS will have the effect of predicating SELF and PIVOT roles of an internal protagonist (which will be specified subsequently) and the SOURCE role of the external speaker as usual.

LOGOPHORIC VERBS will have the effect of predicating all three roles of some internal protagonist.

These are the only lexical constraints associated with predicates which Sells mentions. The 'third person point of view' environment is not lexically determined by a particular embedding predicate, but instead arises constructionally, eg. because a particular interpretation is required compatible with the meaning of a subordinating conjunction which is usually of an adverbial kind.

The final and most important problem with Sells' account is that it provides inadequate motivation for the proliferation of semantic primitives and discourse contexts which he proposes. There seems to be no real evidence for needing more than one additional role to handle logophoricity, nor does it seem to be true that this proliferation of roles actually does handle the non-logophoric data which it is claimed to.

As far as I can determine, three kinds of reasons lie behind Sells' support for three semantic roles: problems with the generality of the role SOURCE, attribution of the

evaluative content of expressions, and grammaticality judgements about sentences containing 'deictically' oriented directional verbs such as *come* and *go*.

First, the role of SELF as defined by Sells seems more appropriate as a description of the role of the relevant participant in the psychological examples than a SOURCE role would be. Recall that SELF is defined as the person whose mental state the proposition describes, whereas SOURCE is defined as the one who makes the report. Some examples with psychological predicates will be discussed below, for instance in (22), which translates as 'That that fool Yosiko was following her drove Mitiko to desperation'. Trying to generalise the role SOURCE to these cases would involve postulating 'implicit acts of communication', as Hagège (1974) is led to do. Separating out at least two roles also in principle offers an explanation for the difficult negated examples, if one assumes that although the role of SOURCE is negated, the entity is still SELF/PIVOT: however, Sells does not make use of this possibility. So defining more than one predicate seems to be an attempt to handle certain problems in making the role 'source', as commonly assumed in the literature, actually work for all the examples.

Second, Sells argues that we need to split SOURCE from SELF/PIVOT in order to explain a difference in the behaviour of 'psychological predicates' and 'logophoric predicates' with respect to the interpretation of evaluative phrases. He claims that the evaluative content of phrases such as *that fool Yosiko* is always attributed by native speakers to the SOURCE participant; for logophoric predicates this will be an internal participant but for psychological predicates and third person point of view predicates it will be the external speaker. The relevant contrasting examples are (21)-(23) (Sells 1987:462-3).

- (21)
- | | | | | | | | |
|---------------------|-----|--------------------|-------|-------|----------|--------|------|
| Takasi _i | wa | Taroo | ni | [baka | no | Yosiko | ga |
| Takasi _i | TOP | Taroo | DAT | [fool | GEN | Yosiko | SUBJ |
| zibun _i | o | oikake-mawasiteiru | koto] | o | hanasita | | |
| self _i | OBJ | chase-around-be | COMP] | OBJ | told | | |

Takasi_i told Taroo that that fool Yosiko was following him_j.

- (22)
- | | | | | | |
|--------------------|-------|--------|---------------------|--------------------|-----|
| [Baka | no | Yosiko | ga | zibun _i | o |
| [fool | GEN | Yosiko | SUBJ | self _i | OBJ |
| oikake-mawasiteiru | koto] | ga | Mitiko _i | o | |
| chase-around-be | COMP] | SUBJ | Mitiko _i | OBJ | |

zetuboo e oiyatta
desperation to drove

That that fool Yosiko was following her_i drove Mitiko_i to desperation.

- (23) Taroo_i wa [baka no Yosiko ga mizu
 Taroo_i TOP [fool GEN Yosiko SUBJ water

 o zibun_i no ue ni kobosita node]
 OBJ self_i GEN on LOC spilled because

 nurete-simatta
 wet-got

Taroo_i got wet because that fool Yosiko spilled water on him_i.

(21) has a logophoric predicate and the SOURCE is the internal participant Takasi. The judgement that Yosiko is a fool is supposed to be attributable only to Takasi, and not to the external speaker. In contrast, (22) and (23) have a psychological and a third person point of view predicate respectively. On Sells' account, in both cases the SOURCE is the external speaker, and this is claimed to explain why these sentences are interpreted as meaning that the external speaker judges Yosiko to be a fool, rather than some internal participant such as Mitiko or Taroo.

Finally, Sells gives several arguments for further distinguishing a PIVOT role. First, he says that logophoric predicates and psychological predicates behave differently from third person point of view predicates with respect to the interpretation of a second group of evaluative phrases, adverbs such as *mysteriously*, and phrases such as *beloved*. The evaluative content of these phrases is claimed to be attributable to the referent with the SELF role; for logophoric and psychological predicates this will be an internal protagonist, whereas for the third person point of view predicates it will be the external speaker. The relevant contrasting examples are (24)-(26) and (27)-(29) (Sells 1987: 464-6).

- (24) Takasi wa [Yosiko ga hukakainimo ato
 Takas TOP [Yosiko SUBJ mysteriously be-following

 o take-mawasiteiru to] itta
 COMP] said

Takasi_i said that Yosiko was mysteriously following him_i.

- (25) [Yosiko ga hukakainimo ato o take-mawasiteiru
 [Yosiko SUBJ mysteriously be-following
 koto ga] Takasi o iradataseteiru
 COMP SUBJ] Takasi OBJ bothers

That Yosiko is mysteriously following him_i, bothers Takasi_i.

- (26) [Yosiko ga hukakainimo ato o take-mawasiteiru
 [Yosiko SUBJ mysteriously be-following
 noni] Takasi wa ki ni sitei-nai
 though] Takasi TOP care to give-not

Takasi_i doesn't mind though Yosiko is mysteriously following him_i.

- (27) Takasi_i wa Taroo ni [itosii Yosiko
 Takasi_i TOP Taroo DAT [beloved Yosiko
 ga zibun_i o nikundeiru koto]
 SUBJ self_i OBJ be-hating COMP]
 o hanasita
 OBJ told

Takasi_i told Taroo that his beloved Yosiko hated him_i.

- (28) [Itosii Yosiko ga zibun_i o nikundeiru
 [beloved Yosiko SUBJ self_i OBJ be-hating
 koto] ga Mitiko_i o zetuboo e
 COMP] SUBJ Mitiko_i OBJ desperation to

That her beloved Yosiko hated her_i drove Mitiko_i to desperation.

- (29) Takasi_i wa [itosii Yosiko ga mizu o
 Takasi_i TOP [beloved Yosiko SUBJ water OBJ
 zibun_i no ue ni kobosita
 self_i GEN on LOC spilled
 node] nurete-simatta
 because] wet-got

Takasi got wet because his beloved Yosiko spilled water on him.

(24) and (27) are examples with logophoric predicates, and in each case, in conformance with Sells' definition of the logophoric context, an internal protagonist - Takasi - has the SELF role. That is, he is the one whose mental state is reported. (25) and (28) are examples with psychological predicates, and again it is an internal protagonist who has the SELF role, Takasi in (25) and Mitiko in (28). Sells claims that native speaker judgements confirm that for all four examples, it is the protagonist with the SELF role who believes the following to be mysterious, or who is attributed the judgement that Yosiko is beloved by him. In contrast, (26) and (29) have third person point of view predicates, where by definition the SELF role is assigned to the external speaker, and here native speakers are reported to attribute the evaluative judgements to the external speaker.¹¹

Further evidence for the PIVOT role comes from constraints on the occurrence of deictically oriented directional verbs with third person point of view examples. The relevant contrasting examples are (30) and (31) (Sells 1987:464-5).

- (30) a. Takasi_i wa [Yosiko ga zibun_i
 Takasi_i TOP [Yosiko SUBJ self_i
- o tazunete-kita node] uresigatta
 OBJ visit-came because] happy
- Takasi_i was happy because Yosiko came to visit him_i.
- b. *Takasi_i wa [Yosiko ga zibun_i
 Takasi_i TOP [Yosiko SUBJ self_i
- o tazunete-itta node] uresigatta
 OBJ visit-went because] happy
- Takasi_i was happy because Yosiko went to visit him_i.

(31) a. He_i was happy when his_i own mother came to visit him_i in the hospital.

b. ??He_i was happy when his_i own mother went to visit him_i in the hospital.

Here, the claim is that Japanese verbs such as *tazunetekita* and *tazuneteitta*, and English

¹¹ (26) counts as a third person point of view example because the subordinate clause is adverbial, even though the matrix predicate is one of the psychological predicates.

verbs such as *come* and *go*, are inherently oriented towards the deictic centre provided by the PIVOT. If the eventuality involves direction towards the PIVOT, *tazunetekita* or *come* must be used; if direction is away from the PIVOT *tazuneteitta* or *go* will be used. Examples (30a) and (31a) are acceptable because in each case the individual with the PIVOT role - Takasi in (30) and he_i in (31) - is the one towards whom the action is directed, and the 'come' form is used; (30b) and (31b) are unacceptable or only marginally acceptable because the 'go' form is not normally allowed in such cases.¹²

In at least two places (p.463 n20, p.465 n23) Sells claims that the judgements reported for the Japanese examples also hold for their English translations, and in fact it is to be supposed that for his analysis to stand up at all, it must in certain key respects admit crosslinguistic generalisation. Yet at least with respect to the English translations of his examples, his arguments on the basis of evaluative phrases and deictic expressions do not seem to hold. It seems to me that it is always possible to attribute the evaluative content of expressions either to the current speaker or to an internal protagonist. In illustration, see example (22), repeated below.

- (22) [Baka no Yosiko ga zibun_i o
 [fool GEN Yosiko SUBJ self_i OBJ

 oikake-mawasiteiru koto] ga Mitiko_i o
 chase-around-be COMP] SUBJ Mitiko_i OBJ

 zetuboo e oiyatta
 desperation to drove

That that fool Yosiko was following her_i drove Mitiko_i to desperation.

Sells says that in this example evaluation of *that fool* must go to the external speaker SOURCE, not to Mitiko, which is SELF and PIVOT. This seems to me to be simply untrue of the facts in English, since although this may be the more natural interpretation, one can fairly readily imagine a situation in which the speaker may be taking Mitiko's point of view, eg. in telling a story, and where evaluation of *that fool* must be relative to Mitiko. Similarly for the examples with *beloved* and *mysteriously*. Coulmas (1985:4)

¹² Sells also argues for a separate PIVOT role on the grounds that whereas assignment of SOURCE and SELF roles are lexically specified, the role of PIVOT is not. The relevant contrast is between example (5) above and the same example with the complementiser *toki*, 'when'; the exact structure of Sells' argument is, I am afraid, opaque, and these examples can equally well be explained by saying that 'because' introduces a logophoric context but 'when' does not.

discusses such evaluative phrases, and mentions *John asked me to dance with his hysterical wife*, where, he says, one would be most likely to attribute this evaluation to the external speaker, exactly the opposite to Sells' predictions. Preferences may obviously be affected by diverse factors in the linguistic context, including the type of evaluation, linear order and whether the sentence is positive or negative.

For the deictic verbs, similar criticisms may be made. Both 'come' and 'go' examples seem fine to me in English, and even Sells admits that his informants' judgements are not consistent. One of the problems with Sells' definition of the PIVOT role is that it does not take account of the fact that it is always the case that some deixis is to be evaluated from the point of view of the current speaker: in fact, the current speaker is always the centre of deixis, though it is possible to have a temporary secondary centre of deixis in a local context. Were he to revise his definition to take account of this, it would start to look less distinct from the SELF role.

Preliminary work with Japanese informants supports the criticisms made at least for sentences containing evaluative expressions. Attribution of evaluative expressions was generally less restrictive than reported by Sells. For example, attribution of the evaluative expression *baka*, 'fool', did not differ for logophoric, psychological and third person point of view predicates: in all cases, both attribution to an internal protagonist and to the external speaker were accepted, with a general preference for the former. Similarly for attribution of the expression *hukakainimo*, 'mysteriously'. For the expression *itosii*, 'beloved', very interesting results were obtained, indicating the complete reverse of the judgements reported by Sells: he says that this expression is like *hukakainimo* in being attributed always to the SELF, an internal protagonist for logophoric and psychological predicates and the external speaker for third person point of view predicates: my informants indicated that there was a general restriction on attribution to an internal protagonist for this expression, which may be due to aspects of its social meaning.¹³

So, the machinery which Sells introduces to handle the phenomena ends up looking not merely slightly ad hoc, but in fact unnecessarily complex.

¹³ The informants were Yuko Kondo and Katsumasa Shimizu, both standard Japanese speakers, the former from Tokyo and the latter from the Kansai area. The results of the questionnaire administered were more complex than the remarks above suggest, and the informants differed from each other in certain respects. Clearly, further work needs to be done in this area. Nevertheless, the results are suggestive.

6.4 An alternative DR Theory account for logophoric phenomena

In section 6.3, I identified several problems for Sells' account. In particular, I suggested that it may not be necessary to distinguish three semantic primitives. It is implicit in Sells' paper that the most important of the three predicates in accounting for logophoric and LDR phenomena is SOURCE. However, even if we restrict ourselves to this one primitive, difficulties still arise. Some of these were mentioned earlier as original motivations for defining further predicates: the fact that SOURCE is not a very good description of the role of the participant in psychological examples, and the problems with negation. In this section, an alternative DR Theory account is proposed, which does make do with just one semantic primitive, defined differently from Sells' SOURCE primitive, and which overcomes these difficulties.

By making the one-dimensional distinction between SOURCE, SELF and PIVOT, Sells tries to account for what are in fact two separate phenomena: the interpretation of deictic elements, and the assignment of responsibility for 'validation' of a proposition. Very generally, one can take 'validation' of a proposition to mean confirmation or corroboration of its truth. The proposal below assumes that a reasonable account for these two phenomena will give rise to an account for logophoric and LDR anaphora as well as the other phenomena discussed by Sells, including the interpretation of phrases with evaluative content, and grammaticality judgements about deictic verbs. In what follows, I shall concentrate on giving an account for validation, and shall have little to say about the interpretation of deictic elements.¹⁴

The main idea of the proposed account is that we need to introduce into Discourse Representation Structures just one extra role, which I shall call that of 'assigned epistemic validator' (henceforth, 'validator'). The validator is (informally) defined as the individual to whom the speaker linguistically assigns responsibility for the discourse in question. In specific cases it may be most accurate to see this responsibility as being for the truth of a proposition, or the actuality of an eventuality, or the accuracy of the linguistic expressions used in asserting the proposition or describing the event. In order not to prejudge the issue, I shall for the moment simply say that the validator is the individual to whom the speaker linguistically assigns responsibility for validating a Discourse Representation Structure.

¹⁴ Interestingly, Sigurdsson (1986) independently arrives at a very similar conclusion about the kind of account which is required.

The notion of epistemic validator is formally encoded as a discourse marker v . Recall that the version of DR Theory we are using encodes ontological types as sorted discourse markers, where a sort is a bundle of features associated with a particular DM, and specified DM letters are used for some standard sorts. The discourse marker v is to be regarded as sorted in this sense, and is similar to the ‘special’ DMs which have been proposed in various versions of the theory for the current speaker ‘I’, for the current addressee ‘you’, or for the time of utterance ‘now’.

In effect, the features associated with a sorted DM place restrictions upon its satisfaction in the model which amount to an implicit predication or condition. Insertion of v into the universe of a DRS is semantically equivalent to insertion of an individual DM x into the universe, plus addition of the condition *validator*(x) to the set of conditions in the DRS (although as we shall see these two alternatives are arguably different from a processing point of view). I treat the validator as a sorted DM rather than a role predicated of a DM (as Sells does his semantic primitives) for reasons of notational convenience, and to emphasise the fact that the validator DM is a member of the universe of the DRS and is thereby available for the resolution of anaphoric NPs.

A further reason for handling it in this way is that it is not entirely clear at this point what the appropriate truth conditions for a validation condition would be. We saw in chapter 4 that the definition of truth in the standard version of DR Theory, assumed in this thesis, says (informally) that a DRS K is true relative to a model M iff there is some embedding function f such that it provides a proper embedding of K within M (i.e. if assignments can be found within M for the DMs in the universe of K , which satisfy all the conditions in K). In some sense, the truth conditions for *validator*(x) would have to be that the condition is satisfied if some assignment to x can be found such that the speaker has linguistically assigned this entity the role of having responsibility for validating the DRS. The metalevel or discourse nature of the condition thus makes it less appropriate to see it as a predicate to be satisfied in the model in the same way that a condition such as *cat*(x) would be. In recent verbal presentations, Kamp has suggested that two types of discourse representation conditions need to be distinguished to account for similar cases: **descriptive conditions** which are the normal predicates to be satisfied in the model, and **formal conditions** which are the kind that apply to the distinct markers for ‘I’ and ‘you’, and to other sortal markers such as those distinguishing eventualities from objects.¹⁵ The DM v would fall into the

¹⁵ I am indebted to Ewan Klein for this information.

latter category.¹⁶

Current speakers of a discourse have three options:

1. To accept the role of validator (the default);
2. To dis-assign themselves as validator;
3. If 2, to re-assign the role to some specified other.

Thus, where the validator DM has a specific referent, this will be either the current speaker, or the referent of some discourse marker which has previously been introduced into the universe of the DRS. It is also possible for speakers to simply dis-assign themselves as validator, without re-assigning the role to a specific referent. These possibilities of assignment are encoded formally by an anaphoric condition linking the DM v with some other DM in the universe of the DRS. There are three possibilities, parallel to the three assignment possibilities listed above:

1. $v = i'$
2. $v \neq i'$
3. $v = x$

Where as will be recalled, i' is the sorted DM used for first person reference, i.e. the current speaker of the DRS, and x is some other accessible DM in the universe of the DRS. Notice that it is assumed that i' is always accessible within the universe of the DRS, whether or not the speaker has explicitly referred to herself.

Anaphoric conditions of this kind will thus be true iff there is some assignment in the model for i' or x which satisfies all the conditions previously predicated of i'/x , and which in addition satisfies the condition that i'/x is assigned responsibility for validation of the DRS K in the universe of which it appears.

The introduction of anaphoric conditions linking v to some other DM and thereby assigning the role of validator to some referent is due either to lexical rules or to a default rule. Basically, grammatical constructions may include items with lexically specified properties which refer to the role of epistemic validator. If not, the default is for the role

¹⁶ In fact, it seems likely that a version of DR Theory with a different semantics might solve some of these problems. See Stirling (forthcoming) for some ideas about the form of an alternative semantics. Notice that an Intuitionistic semantics (see Dummett 1975, 1976, 1977), which takes the notion of **proof** as basic rather than that of **truth**, intuitively offers a nice way to incorporate the concept of the validator.

to be assigned to the current speaker. In particular, predicates which are capable of triggering a logophoric context form a coherent set united by the following two lexical properties:

- (i) They are subcategorised for a clausal complement;
- (ii) The validator for the clausal complement is constrained to be the referent of some subcategorised for nominal argument of the matrix clause, usually the subject NP.

The effect which this achieves is that the epistemic validator of a clausal complement of a verb of communication, thought, psychological state or perception, will be the subject (usually) of that verb, i.e. the individual who uttered the speech, had the thought, experienced the psychological state, or experienced the sensory perception. This is as one would wish, since these very individuals are the best (perhaps the only) witnesses to the truth, actuality or accuracy of description of the content of what was said, thought, felt or perceived.

More formally, the lexical entry for a logocentric verb, whose subject is the logocentric NP, will have the following general form:

$$\begin{array}{l} w \\ S_1[FIN]NP:x/S_2[SUB]:[a_2]A \\ [a_1] [\text{pred}'(a_1, x, a_2) \ \& \ \text{val}(a_2) = x \ \& \ [a_2]A] \end{array}$$

Here, we introduce a function **val** which applies to DRSs of index **a** and gives as value the validator DM for that DRS.

Thus, the lexical entry for the Ewe verb *be*, 'say', would be:

$$\begin{array}{l} be \\ S_1[FIN]NP:x/S_2[SUB]:[a_2]A \\ [a_1] [\text{say}'(a_1, x, a_2) \ \& \ \text{val}(a_2) = x \ \& \ [a_2]A] \end{array}$$

In the template and the actual lexical entry given above, the unsorted DM a_2 is used in the semantics for the clausal complement. In fact, we need to make distinctions between DMs of at least two sorts, which will be introduced for the DRSs representing clausal complements. I assume that an appropriate semantics for predicates which take such complements will result in some of them requiring their clausal argument to be a proposition, whereas for others it will be required to be an eventuality. For example, the object of predicates of communication, consciousness and thought would seem to be a

propositional entity. The object of predicates of perception would seem to be an eventuality. Propositional entities will themselves involve reference to an eventuality. Hence, we will use the DM letters p_i, \dots, p_n for propositional sorts of DMs, and the DM letters e_i, \dots, e_n for event sorts of DMs (we leave state types of DMs out of account here). The semantics for a sentence such as (32a) will look something like (32b), such that (32b) entails (32c). The semantics for a sentence like (33a) will look like (33b).

(32a) John believes that Tom kicked Fred.

(32b) [a] [believe'(a,j,p) & john'(j) & p = [e] [kick'(e,t,f) & tom'(t) & fred'(f)]]

(32c) [a] [believe'(a,j,[e] [kick'(e,t,f) & tom'(t) & fred'(f)]) & john'(j)]

(33a) John saw Tom kick Fred.

(33b) [a] [see'(a,j,e) & [e] [kick'(e,t,f)]]

Note that a propositional DM can thus be anaphorically linked either to another propositional DM or to an event DM. It seems a reasonable constraint to add that an event DM may not appear on the left hand of an anaphoric condition linking it to a propositional DM on the right hand side.

The distinction between propositional and eventuality variables is an important part of the account. As we saw in 6.3, Sells uses propositional DMs in the representation of embedded clauses; however, he distinguishes propositional predicates, for which he defines logophoric contexts, from psychological predicates, for which a different discourse environment is defined, on the basis of whether it is the SOURCE role or the SELF role which is assigned to an internal protagonist: this is one of the reasons for distinguishing the two roles, and is motivated by differences in the meaning of the different types of predicates, and evidence from evaluative expressions. I argue that this distinction is epiphenomenal upon the distinction between propositional types of entities and event types of entities, and hence between what it means to be able to validate a proposition and to vouch for the actuality of an event. For propositional predicates the epistemic validator is the 'source' of the speech or thought. Thus in the example *Takasi told Taroo that Yosiko was following him*, the validator is Takasi. For psychological predicates the epistemic validator is the 'self' experiencing the psychological state. Thus in the example *That Yosiko was following her drove Mitiko to desperation*, the validator is Mitiko. By using just the role of validator, we can generalise over these two cases, and thus explain why it is possible to use logophoric pronouns in the clausal complements of both types of

predicate, something which Sells has no account for.¹⁷

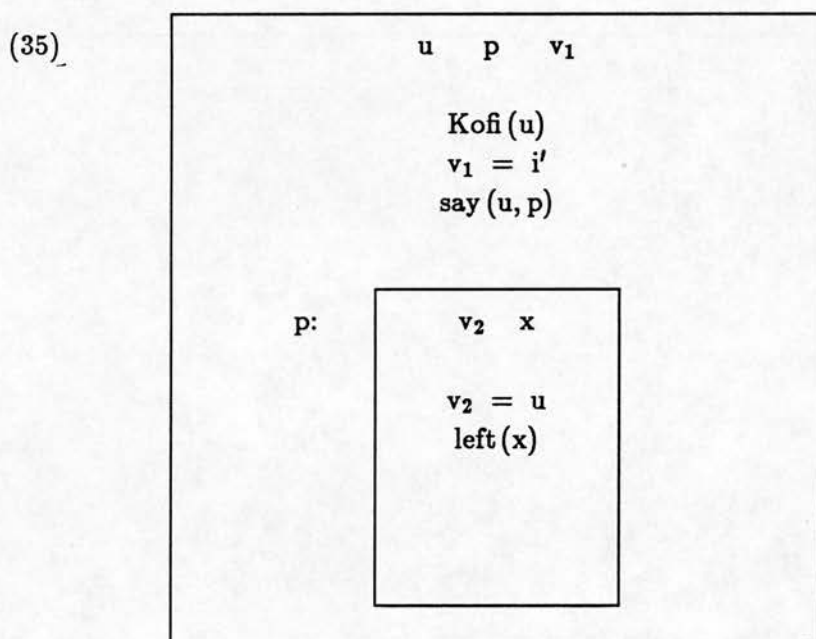
At present, the machinery we have introduced will support the following type of DRS (again, using an Ewe example). Here, each DRS 'box' represents a distinct propositional content, and each propositional content is assumed to have its own validator.¹⁸

- (34) a. kofi be yè-dzo
Kofi say LOG-leave

Kofi_i said that he_i left.

- b. kofi be e-dzo
Kofi say PRO-leave

Kofi_i said that s/he_j left.



The question which logophoric systems are designed to answer concerns the assignment of reference to the DM x in the embedded DRS. As we have seen, many logophoric languages, including Ewe, require a logophoric pronoun to be used if x is coreferential with *Kofi*, and a normal third person pronoun to be used otherwise. In our account, we say that a logophoric pronoun must take (or share) the reference of the epistemic validator in

¹⁷ Note that Sells does not talk about events at all, since he does not discuss temporal reference; if one did incorporate temporal reference into his account, it would be necessary to define his propositional entities as incorporating reference to eventualities, as specified above.

¹⁸ For ease of exposition and comparison with Sells, we use standard DRS notation here, which is completely convertible into the indexed language used in UCG.

the universe of its DRS. That is, v_2 and x must have the same referential assignment in the model. In this way we indirectly require that the reference of the logophoric pronoun must be the same as that of the subject of the matrix verb.

Hence, to complete the DRS in (35) for example (34a), we need to add the anaphoric condition $x = v_2$; and to complete it for example (34b), we would need to add an anaphoric condition linking x to some other DM in the universe of a higher DRS.

The account suggests an explanation for why logophoric pronouns generally do not have first person forms. In a situation where the current speaker is reporting her own speech, the default assignment of reference to the validator of the embedded DRS, and the lexically required assignment, will be the same. We rule out the possibility of a logophoric pronoun nevertheless occurring in the embedded clause, coreferential with a validator linked to the current speaker, through the assignment of incompatible person features: logophoric pronouns are required to be $\neg[1]$, i.e. either second or third person; since the current speaker is inherently first person, the two will fail to unify or to be co-assigned in the model.

The lexical entry for a logophoric pronoun or a LDR will have the following general form:

$$\begin{array}{l} w \\ \text{NP}[\neg[1], \text{SG}, _] \\ [x_i] [x_i = v]^{19} \end{array}$$

Thus, the entry for the Ewe logophoric pronoun *ye* will be:

$$\begin{array}{l} ye \\ \text{NP}[\neg[1], \text{SG}, _] \\ [x_i] [x_i = v] \end{array}$$

These are the basic elements of the account. Clearly, the notion of epistemic validator is rather like that of SOURCE. Both are semantic primitives introduced into DRSs via lexical rules or a default rule; and, as defined, SOURCE and validator roles will have the same reference assignment on all occasions. The main difference is in their definition. The defined role of epistemic validator allows a more coherent account of the data than Sells' defined role of SOURCE, or the combined roles of SOURCE, SELF and PIVOT. Validator

¹⁹ It may specify other conditions about number and gender as well.

is more satisfactory than SOURCE because it gets round the problems of generalising the SOURCE role, which seemed to be one of the reasons for Sells proposing two additional roles. These problems are listed below.

(i) The role SOURCE strictly speaking applies only to predicates of communication. In order to generalise it to other logophoric predicates, it is necessary either to postulate 'implicit acts of communication', as Hagège (1974) and Clements (1975) do, or introduce a separate role SELF, as Sells does; except that Sells simply does not account for the possibility of logophoric pronouns occurring in the clausal complements of psychological predicates. In contrast, the role of validator is given a uniform definition for all logocentric predicates.

(ii) Examples in which the logocentric verb is negated are an unresolved problem for accounts relying on the role SOURCE, or for that matter, SOURCE, SELF and PIVOT. Such examples involve the explicit denial that some individual has the role SOURCE, yet it remains possible to use logophoric pronouns in clausal complements of these negated predicates. This is not a problem for an account using the role of validator, since even in the case where the individual in question did not utter the speech, or have the mental, psychological or physical experience, it still makes sense to think of her as responsible for the validation of the content of the speech or experience, even if just to confirm its non-existence.

I will now give some more detailed analyses for the different kinds of examples mentioned by Sells and quoted earlier in this chapter.

We have already looked at the paradigmatic type of example, where a logocentric predicate takes a logocentric NP subject and a clausal complement which is its logophoric context (see (34), (35)). As we have seen, however, there are other ways of triggering a logophoric context, although in all cases, the syntactic relationship between the clauses is one of subordination, and it is an argument of the matrix verb which is the logocentric NP.

First, in some languages the logocentric NP may be the object of the logocentric predicate - or possibly some other argument, but all the examples we have looked at have involved subjects or objects. Within the UCG framework we are using, it is simple enough for the lexical entries for the individual verbs to pick out the correct NP argument as anaphorically linked to the *v* of the embedded clause. Thus, the lexical entry for the Japanese verb *yuutunisita*, 'distressed', as in example (36), might look something like (36').

- (36) Yosiko ga zibun_i o musisita koto ga Taroo_i o yuutunisita
That Yosiko ignored self_i distressed Taroo_i.

(36')

yuutunisita

$S_1[FIN]S_2[SUB]:[p]A/NP:x$

$[a] [distress'(a,p,x) \ \& \ val(p) = x \ \& \ [p]A]$

That is, *a* is an eventuality in which *p* distresses *x*.

Note that in all cases the logocentric NP is another subcategorised for argument in the clause in addition to the clausal complement. Usually, it is the only other such argument, and in any case, it is the NP argument which is most 'animate' on some 'animacy hierarchy' of capacity for being an agent or experiencer such as that proposed by Silverstein (1976); equivalently, highest on a hierarchy of thematic roles such as that proposed by Jackendoff (1972)). That is, the logocentric NP is the agent if there is one, and the experiencer if there is no agent role. Of course, all arguments in the clause are more 'animate' than the clausal complement.²⁰

Second, the logophoric context may be triggered by some element of the subordinate clause itself, a complementiser, a conjunction (like Japanese *node*) or a relative clause marker; in such cases the logocentric NP is the subject of the previous verb. These are all cases where the logophoric context has been grammaticised. We can account for such cases by having the lexical entry for the complementiser introduce an anaphoric condition linking the validator of the complement clause with the relevant NP of the previous clause. We can draw on the notion of 'protagonist' introduced in chapter 5, and appropriately defined for the language in question, to allow us to make reference to the logocentric NP. The lexical entry for *node* could look something like this (leaving aside problems of linear order):

node

$S_1/S_2:[a_2]A$

$[a_1] [a_1 \text{ because } a_2 \ \& \ val(a_2) = prot(a_1) \ \& \ [a_2]A]$

²⁰ Cf. also Hellans' (1986) notion of role-command as discussed by Sigurdsson (1986:39f.). He notes that reflexives of all kinds in Icelandic must link to the highest NP on a hierarchy of roles, and must not be higher on the hierarchy than their antecedents. This explains the grammaticality judgements on the examples *Brefid sannfaerdi Mariu um ad Olafur hefði gleymt sér*, 'The letter convinced Mary that Olaf had forgotten *it/?her/himself' and *petta vandamal krafðist þess ad vid hugsudum stodugt um það/*sig* 'This problem demanded that we were constantly thinking about it/*self'.

Alternatively, in Ewe it seems that subjunctive mood is both necessary and sufficient to trigger a logophoric context in the absence of a logocentric predicate. I propose that the general form of the rule covering such cases will make reference to the parameter *Actual* which it was argued in chapter 5 is part of the eventuality index. Basically, such rules will state that if the value of *Actual* for (the eventuality index of) a subordinate clause is {non-actual}, then the validator of the subordinate clause is anaphorically linked to the matrix subject.

We have seen that subjunctive mood is often required within logophoric contexts triggered by other means, as in Icelandic. Clearly, for a language such as Icelandic, where subjunctive mood is required in all logophoric clausal complements,²¹ we now have two mechanisms available for accounting for the introduction of the logophoric context and the establishment of a logocentric NP. The partial overlap of function of the two mechanisms does not seem to be a problem. For any individual language, the most elegant solution will be chosen. In Icelandic, at least in some common dialects (see Sigurdsson (1986), Rognvaldsson (1986)), subjunctive mood is a necessary but not a sufficient condition for establishment of a logophoric context. Subjunctive mood may arise for other reasons and in examples like these (eg. (37)) - mainly adverbial clauses - LDRs may not occur. So for Icelandic, the best solution is to say that logophoric contexts are triggered lexically by logocentric predicates, and that whenever the condition $v \neq i'$ holds, subjunctive mood is required. In Ewe, in contrast, we need both mechanisms to give a comprehensive account of logophoricity, since logophoric contexts may be triggered by both logocentric predicates and by the complementiser *be* plus subjunctive mood.

(37) a. Maria er her enn þó að ég kyssi *sig/hana.
 Maria is here still though I kiss (S) *self/her.

b. Olafur segir Maria er her enn þó að ég kyssi sig/hana
 Olafur says that Maria is here still though I kiss (S) self/her.

It could be argued (and is implicit in eg. Popowich's (1988) account) that use of a [+log] feature is motivated precisely by the desirability of avoiding inconsistency both crosslinguistically and within languages such as Ewe. However, notice that although two mechanisms for triggering logophoric contexts are postulated above, the account given for

²¹ Except marginally, for some speakers, with otherwise 'logocentric' verbs which just don't require the subjunctive in their clausal complements; cf. Sigurdsson (1986), also noted in Maling (1984:n5). The variation occurs in 'semifactive' verbs like 'know' and 'see'.

the logophoric pronoun is consistent throughout, and it seems to me entirely reasonable to expect some lack of consistency in accounting synchronically for a context which has clearly been expanded and somewhat grammaticised due to diachronic processes, from an initial complement of the verb 'say'.²²

Notice that so far, we have not needed to use a [+log] feature at all. The correct results have followed from the semantics of the logocentric triggers, and of the logophoric pronouns, both of which make reference to the single addition to the theory: the epistemic validator. The account predicts, therefore, that in languages with logophoric pronouns or LDRs, in any case where the validator is assigned to some entity other than the speaker, it will be possible to use a logophoric pronoun or LDR to refer to that validator. In order to confirm or disconfirm this prediction, it would be necessary to look for examples in a logophoric language in which it was clear for independent reasons that the validator role had been assigned to some entity other than the speaker, and check whether or not logophoric pronouns could occur in that context. If they could not, this would suggest, at the least, that introduction of a 'logophoricity' feature [+log] may be necessary.

We have now discussed the way in which the establishment of a logophoric context and a logocentric NP is handled. In the outline of the account given above, we also saw examples of the lexical specification of logophoric pronouns, and of the anaphoric conditions which they introduce, to link them to the validator of the DRS whose universe they belong to. We considered only singular logophoric pronouns, but it is a simple matter to extend the account to plural ones. We need to cover two cases, that where the set referred to by the logophoric pronoun is completely coextensive with the set referred to by some previous plural pronoun, and that where the logophoric pronoun merely includes in its reference some previous singular referent. To do this it is necessary to make use of the \supseteq (superset or equal to) anaphoric linking relation introduced in chapter 4. The lexical entry for a plural logophoric pronoun will therefore look like the following, for the Ewe plural pronoun *yewo*.

²² It must be acknowledged, however, that this way of handling in UCG the triggering of a logophoric context and establishment of some argument as the logocentric NP, does lack generality in certain respects. For instance, instead of having two rules or types of lexical entry to cover cases (i) and (ii), it should be possible to generalise over these by making reference to thematic roles and the animacy hierarchy. It is clear enough how this could be done informally, but the formal mechanisms for handling it in UCG await development. A GB account of the kind proposed by Marantz (1984) may be a fruitful source of ideas here.

yewo
 NP[¬[1],PL, _]
 [X_i] [X_i ≥ v]

As in chapter 5, the lower case letter is treated as neutral as to number, so that this *v* could unify with a singular DM or an upper case DM specified as plural.

Examples (38a,b) and their DRSs illustrate the two types of plural linking.

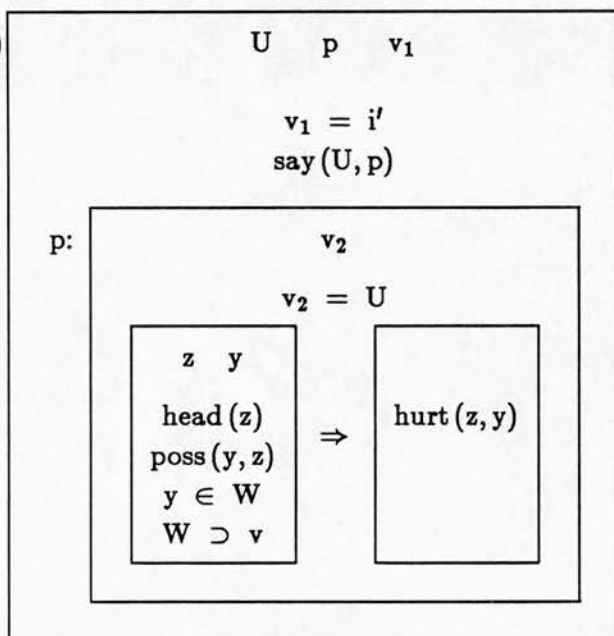
- (38) (a) à (rɪŋ) wò gā tɪ sā:rā tʃɪ sā:rā
 PRO (say) PL COMP head LOG(PL) hurt LOG(PL)

They_i said that they_i had headaches. (Tuburi)

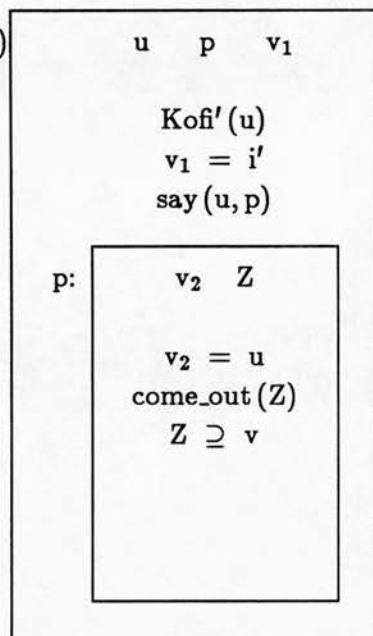
- (b) kofi kpo be yèwo-do go
 Kofi see COMP LOG_PL-come out

Kofi saw that they (including Kofi) had come out. (Ewe)

(38) (a)



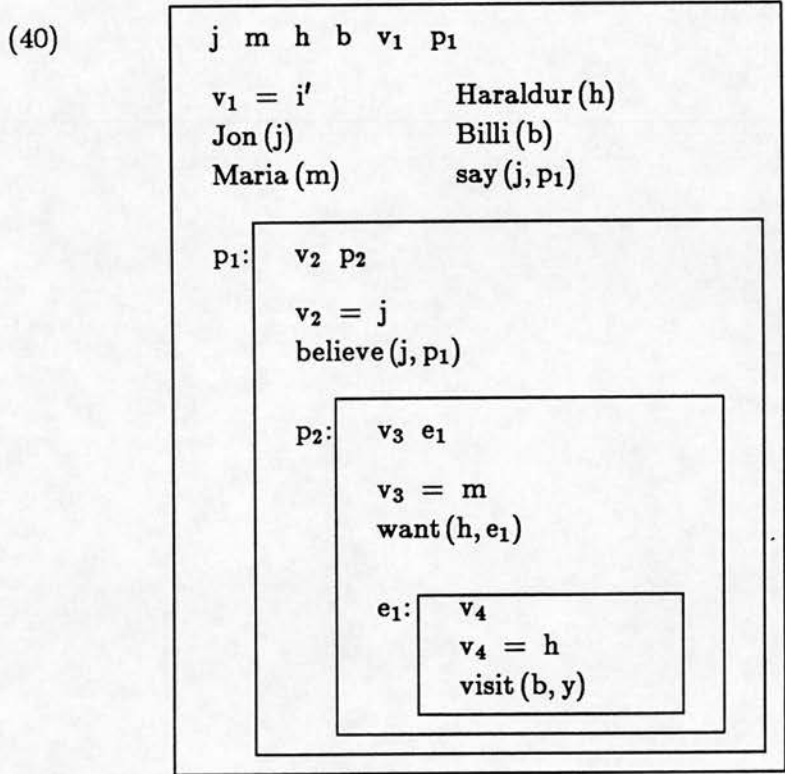
(b)



Three other aspects of logophoric phenomena need to be taken into account: multiple embedding of complement clauses, logophoricity across sentence boundaries, and optionality of logophoric pronouns.

Example (39) from Icelandic is an instance of multiple embedding. Given the account so far, it would have the DRS in (40).

(39)	Jón	segir	að	María	telji	að
	Jon	says(I)	that	Maria	believes(S)	that
	Haraldur	vilji	að	Billi	heimsaeki	sig.
	Harold	wants(S)	that	Billy	visit(S)	self.



So far, we have said just that the anaphoric constraint on logophoric pronouns states that they must be linked to *v*. The case where *v* was the current speaker was ruled out by feature incompatibility. For examples like (39), Icelandic speakers apparently judge any of the subject NPs, *Jon*, *Maria*, *Haraldur*, or *Billi*, to be acceptable antecedents for the LDR. This actually follows from the account as it stands: all we require is that the logophoric pronoun DM be linked to some DM which is of the sort *v*, provided it is not first person: given the definition of accessibility in DRT stated in chapter 4, any *v* DM accessible, i.e.

any one higher in the DRS, will be a possible antecedent.²³

However, there are two types of example which on the surface are problematic for this account.

For languages such as Mundang, where the depth of embedding at which a logophoric pronoun can occur is restricted to the immediately subordinate clause, a further restriction must be placed on the anaphoric condition for logophoric pronouns, to the effect that the link must be to the nearest accessible *v*. The type of restriction to be required would presumably be similar to that required for normal reflexive and reciprocal pronouns such as are found in English.²⁴

In Icelandic, when the most deeply embedded clause is an adverbial clause rather than another noun clause, an LDR may not be used coreferential with the immediately dominating matrix clause subject, but only with a higher subject. The relevant examples are (40)-(42).

- (40) *Jon yrði gladur ef Sigga byði ser
Jon would_be(S) glad if Sigga invited(S) REFL

- (41) Haraldur segir ad Jon komi fyrst
Harold_i says(I) that Jon_j comes(S) since
Sigga bjodi ser
Sigga invites(S) REFL_{i/*j}

- (42) a. Jon_i truir [ad hann_i verdi alltaf
jon_i believes [that he_i will-be forever

²³ It is uncontroversial for Icelandic that all intervening verbs must take subjunctive mood whether or not they do so usually, and that as long as all the intervening clauses are subjunctive, the logocentric NP may act as antecedent to a deeply embedded LDR. What is more controversial is the status of the intervening subject NPs. In some accounts, such as Anderson (1986) and Maling (1984), it is claimed that all intervening subjects become accessible as antecedents for the LDR whether or not they would be possible antecedents in isolation (i.e. whether or not we would normally analyse them as introducing a validator). However, the judgements are controversial, as Rognvaldsson (1986) and Sigurdsson (1986) show. If the judgements are sound, then we would point out first that the verbs which are involved are archetypal logocentric predicates (such as 'know'), even though we would not normally count them as such in Icelandic. It may be that some grammaticisation is in progress, and that the presence of the 'dripped down' subjunctive for some speakers just about licences the use of the LDR.

²⁴ There is no scope in this thesis to explore such an account, however, see Stirling (1988b).

froskur	[nema	konungsdottir	kyssi	sig _i]].
a-frog	[unless	a-princess	kisses	self _i]].

Jon_i believes that he_i will remain a frog forever unless a princess kisses him_i.

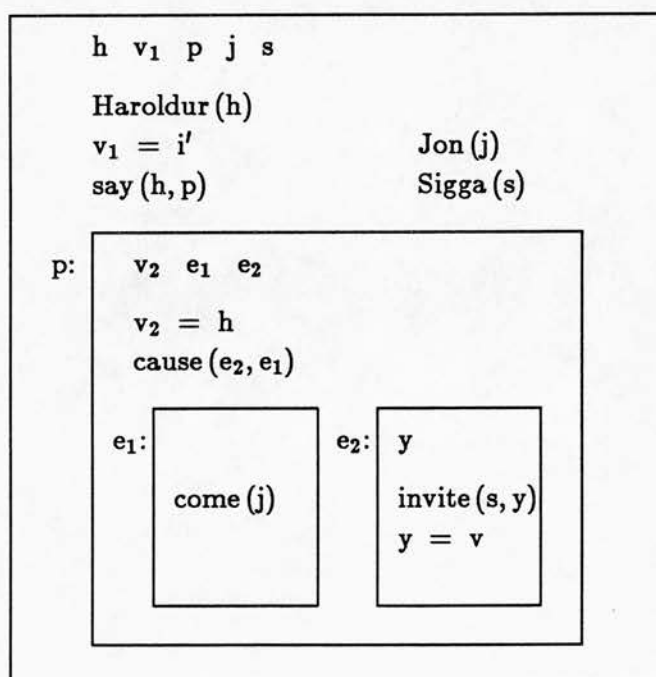
b. *pvi er truað [ad hann_i verdi
 it is believed [that he_i will-be

alltaf	froskur	[nema	konungsdottir	kyssi	sig _i]].
forever	a-frog	[unless	a-princess	kisses	self _i]].

It is believed that he_i will remain a frog forever unless a princess kisses him_i.

In (42), this higher subject is in fact the only NP that fits the requirement of being a logocentric NP ('source'). In any case, these present no difficulties for the proposed account, as their DR Structures (given in (43)-(45)) indicate.

(43)



(44)

u p v₁

v₁ = i'

Jon(u)

believe(u, p)

p:

v₂

v₂ = u

y z

princess(y)

¬kiss(y, z)

z = v

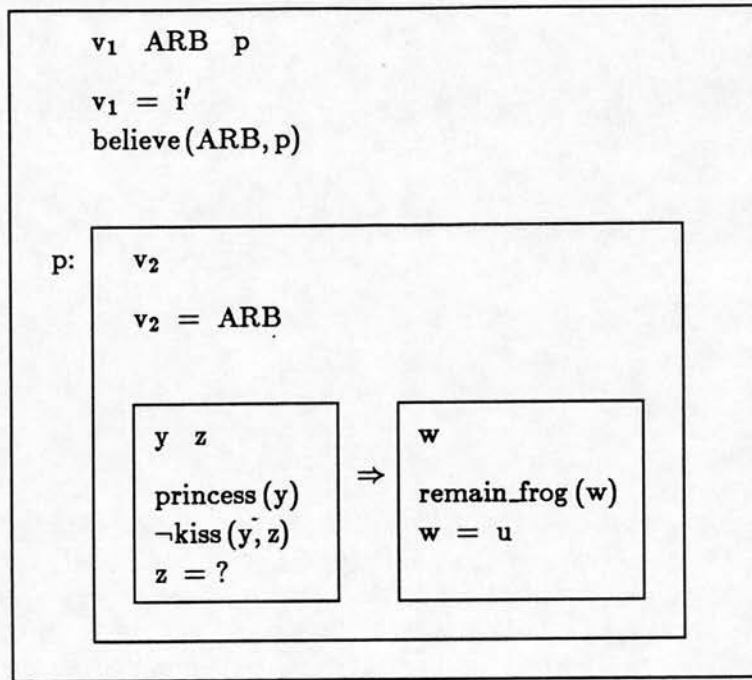
⇒

w

remain_frog(w)

w = u

(45)



In (41)/(44), the only possible antecedent for the logophoric pronoun is the validator DM, assigned to *Haroldur*. This is accessible to the LDR because it is in a higher DRS universe. There is no way in which another validator DM could be introduced, set equal to *Jon*, because *Jon* is not the subcategorised for argument of a logophoric predicate. Notice that on an account where one tries to handle multiple clausal complements by claiming that any subject NP between a logocentric NP and a logophoric pronoun is a possible antecedent, this example is problematic (see Sells (1987) and Maling (1984) for examples of such accounts). However, it is not a problem if the claim is only that any **validator** is a possible antecedent.

Example (42b) is interesting because the question arises as to what happens when the logocentric predicate appears as a passive, in particular as a truncated passive. The active (42a) causes no problems. In (42b), the passive version, there is no explicit mention of a believer. In such a case I shall say that the validator is assigned to *ARB*, meaning some arbitrary or unspecified individual, which could be or include the current speaker. Assuming that *Jon* has been mentioned elsewhere in the discourse, and hence is accessible to the normal personal pronoun as an antecedent, the question is whether it is possible to find an interpretation for the DM z introduced by the LDR. Anaphoric linkage to the v assigned to *ARB* can be ruled out by an additional specification on the logophoric pronoun that it must have specific reference: this can be done by using a feature DEF with values

{definite,indefinite}); not only is this feature presumably required anyway to distinguish definite from indefinite NPs, but it is in fact necessary to put such a constraint on the validator to rule out examples like **Skodun sumra Islendinga_i er ad sig_i vanti haefileika* 'Some Icelanders have the opinion that they lack talents'.

We also saw that in many languages, once a logophoric context is set up, it may extend across sentence boundaries and be maintained for some considerable stretch of discourse: this is not unconstrained, however, since in the examples given the chunk of discourse concerned is the content of the reported speech, thought or experience; i.e. it is correct to see it as all falling within the responsibility of the same assigned validator (just as with multiple complement clauses it is correct to allow higher validators to be accessible to lower clauses).

These extended logophoric contexts are trivially easy to represent within DRT: we simply treat all additional material as falling within the DRS set up by the original logocentric verb.²⁵ Thus, we are able to avoid solutions such as that proposed by Maling (1984:239,n27), who assumes that in such circumstances, 'the matrix verb of saying is (presumably) elliptical'.

The final aspect of logophoric phenomena which we need to look at in more detail is the optionality of the use of logophoric pronouns of which we have seen examples of from many languages, and which we saw was in each case associated with a meaning distinction: if the current speaker accepts the proposition in question, a normal personal pronoun may be used; if the speaker does not accept it, a logophoric pronoun will be used.

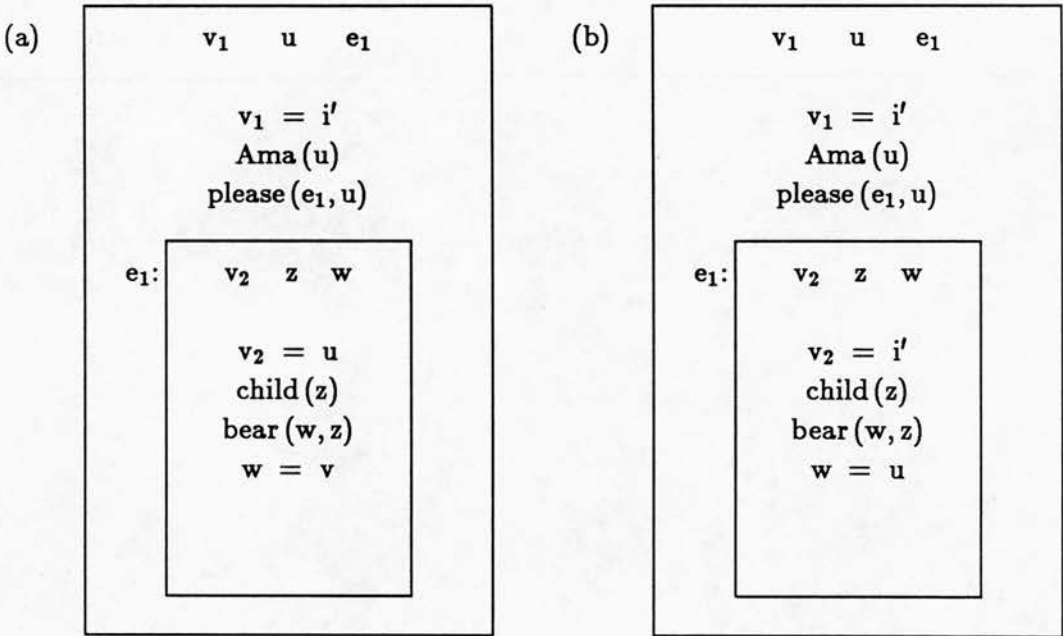
The account proposed here not only allows this degree of optionality, but also gives us the relevant meaning distinction for free - in contrast to Sells' account, or an account based purely on a SOURCE role, where several further inferential steps are required. The optionality is allowed by saying that as a general rule, it is always possible for a validator to be current speaker, so that the lexical assignment of validator by logocentric predicates is in effect optional. In languages which do not allow this optionality, we simply say that lexical assignment of validation cannot be overruled by default assignment. When the speaker is chosen as validator of a clausal complement of a logocentric predicate, the use of a logophoric pronoun is ruled out: feature incompatibility prevents it being linked to any

²⁵ However, it is not trivial to ensure that such a representation is constructed, cf. Roberts (1984).

accessible validator, and there is no other way in which it can be linked to the relevant matrix NP, so only a normal personal pronoun is possible. The meaning distinction follows straightforwardly from assignment of responsibility for validation. The following two DRSs show the different analyses given to the two choices for the examples in (46).²⁶

- (46) a. e nyo na ama be ye a dyi vi
 that is good Ama COMP LOG SBJV bear child
- b. e nyo na ama be wo a dyi
 that is good Ama COMP PRO SBJV bear child

It pleases Ama that she is with child.



²⁶ Sigurdsson (1986) notes an example which makes this account more complex: in Icelandic, one can have an LDR referring to the subject of a main clause and a personal pronoun referring to the some other superordinate subject, in the same subjunctive clause:

Jon_i taldi að María_j hefði sagt að eg hefði skilad henni_j bokunum sinum_i.

Jon believed that María had said that I had returned his books to her.

I have seen no convincing examples where there is an LDR and a personal pronoun in the same clause coreferential with the same antecedent.

6.5. Generality of the account

Like Sells, I have been trying to find a semantic/discourse framework which will not only account for logophoricity but also for lexical and syntactic choices which may be determined by the same or similar factors, such as evaluative phrases, subjunctive mood, etc. I have shown that the account proposed in 6.4 can handle the full range of logophoric phenomena, and that it is therefore at least equivalent to Sells' account in observational adequacy. I have also argued that the proposed account is preferable to Sells' in terms of elegance and descriptive adequacy. In order to properly evaluate it, however, we need to consider further how well the account given generalises to related phenomena. I shall briefly consider the topics listed below.²⁷

²⁷ As Stirling (1988b) shows, my account can be modified to handle the logophoric system in Gokana as well. I believe that it also offers a potentially coherent account for evidential markers. Both of these are topics which Sells does not address.

- (i) LDRs and clause-bound reflexives
- (ii) attribution of evaluative expressions
- (iii) interpretation of deictic expressions
- (iv) binding

LDRs and clause-bound reflexives

I shall use data from Icelandic in illustration. Other LDR languages do not seem to be interestingly different for purposes of this discussion.

On the basis of the discussion so far, we would assign the following lexical entries for the LDRs *sig* and *ser* (we shall not discuss the possessive form *sin*).

sig
NP[¬[1],SG,ACC]
[x_i] [$x_i = v$]

ser
NP[¬[1],SG,DAT]
[x_i] [$x_i = v$]

Where, as we saw in 6.4, there is no further restriction on the anaphoric condition, i.e. the v could be any compatible (non-first person) v accessible to the DM.

However, both these pronouns can also be used coreferentially with the subject of the clause containing them, whether or not it is a validator, and whether or not the clause is in a logophoric context. For some speakers, they may also be used coreferentially with nonsubject NPs in the same clause, see Maling (1984, 1986) and Rognvaldsson (1986).

If Icelandic did not allow logophoric pronouns to be coreferential with any accessible validator, not just the validator in the clause containing the pronoun, then we could generalise over the two uses by saying simply that reflexive pronouns must find an antecedent in the (DRS for) the current clause. This might be the subject DM, or it might be the validator DM. As it is, we need to have two lexical entries for each pronoun, or equivalently a disjunction in the semantics to the effect that an accessible antecedent for the reflexive pronoun must be either a (subject) NP in the current clause or any validator.

Nevertheless, the proposed account allows a more uniform treatment than is proposed by Hagège and Sells, who claim that LDRs and clause-bound reflexives are homophones, the

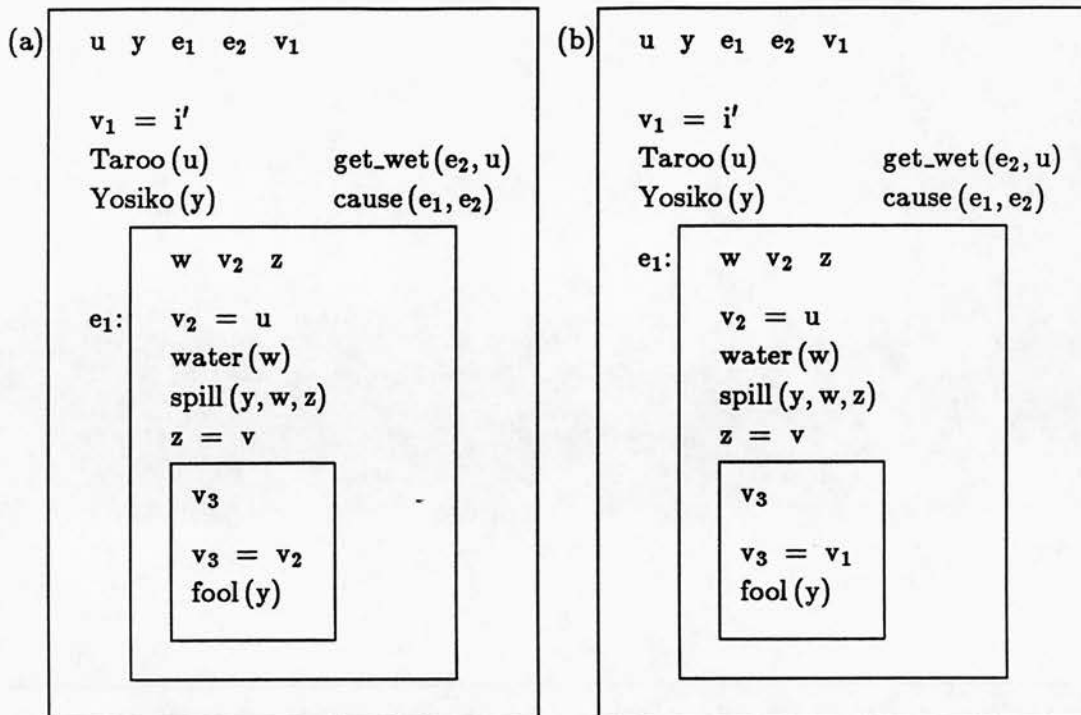
one to be accounted for syntactically and the other semantically. In addition, the fact that the validator DM is an accessible antecedent within a local context may explain the initial historical extension of function of the reflexive pronoun.

Attribution of evaluative expressions

Sells argues for his proliferation of semantic primitives on the basis of giving correct attribution to the evaluative content of expressions such as *beloved Mary*, *that fool Yosiko*, *mysteriously*, etc.

My account for such expressions states that they are lexically specified to introduce a new validator DM, which will be anaphorically linked to some other accessible validator DM. So one of the conditions introduced by such a phrase will be $v_i = v$. Usually, any validator to which v_i is linked will itself be assigned to the current speaker. Within a logophoric context, however, there will be a choice between the nearest accessible validator, assigned to the logocentric NP referent, and the current speaker. The apparent general preference for the former can be explained in terms of relative accessibility. This analysis is supported by intuitions that in multiple clause complement structures, again any one of the accessible validators may be attributed the evaluative content of such a phrase. In illustration, see the following DRSs for example (47).

- (47)
- | | | | | | | |
|--------------------|-----|-------|-----|--------|------|-------|
| Taroo _i | wa | [baka | no | Yosiko | ga | mizu |
| Taroo _i | TOP | [fool | GEN | Yosiko | SUBJ | water |
-
- | | | | | | | |
|-----|--------------------|-----|----|-----|----------|---------|
| o | zibun _i | no | ue | ni | kobosita | node] |
| OBJ | self _i | GEN | on | LOC | spilled | because |
-
- nurete-simatta
wet-got
- Taroo_i got wet because that fool Yosiko spilled water on him_i.



Interpretation of deictic expressions

A further argument which Sells gives for distinguishing a PIVOT role in addition to SOURCE and SELF roles is to account for linguistic judgements about the possibilities of use of deictic expressions. For example, he says that the grammaticality contrast between the two sentences in (48) is explained because in these examples *Takasi* is PIVOT (as well as SELF) and the verb 'came' must be interpreted as describing direction towards PIVOT, whereas the verb 'went' must be interpreted as describing direction away from PIVOT. Regardless of questions about the grammaticality judgements used here (even Sells admits they are not universal), there seems to be no reason for introducing a separate primitive to handle the data. In the proposed account, the DRS in (49) would be given for (48).

- | | | | | | | | |
|------|----|---|-------------------|---------------------|------------|---|----------|
| (48) | a. | Takasi _i
Takasi _i | wa
TOP | [Yosiko
[Yosiko | ga
SUBJ | zibun _i
self _i | o
OBJ |
| | | tazunete-kita
visit-came | node]
because] | uresigatta
happy | | | |
| | | Takasi _i was happy because Yosiko came to visit him _i . | | | | | |
| | | | | | | | |
| | b. | *Takasi _i
Takasi _i | wa
TOP | [Yosiko
[Yosiko | ga
SUBJ | zibun _i
self _i | o
OBJ |
| | | tazunete-itta
visit-went | node]
because] | uresigatta
happy | | | |
| | | Takasi _i was happy because Yosiko went to visit him _i . | | | | | |
| | | | | | | | |

(49)

u v₁ s₁ e₁ y

v₁ = i'

Taroo(u) happy(s₁, u)

Yosiko(y) cause(e₁, s₁)

e₁: v₂ z

 v₂ = u

 visit(y, z)

 z = v

It seems very natural to state the deictic conditions on verbs like 'come' and 'go' in terms of the validator, and this achieves the correct results here: 'come' must involve movement towards the validator and 'go' must involve movement away from it. I will say nothing further about this here, since evaluation of whether this is an appropriate account will depend on further work in two areas: first, checking whether consistent accounts can be given for other deictic phenomena, and second, work on the embedding conditions for

Binding

Sells (p.467f.) claims that logophoric pronouns, or more generally, any role-predicates, always have a variable binding interpretation when involved in anaphoric relations. The evidence given for this are pairs such as the following:

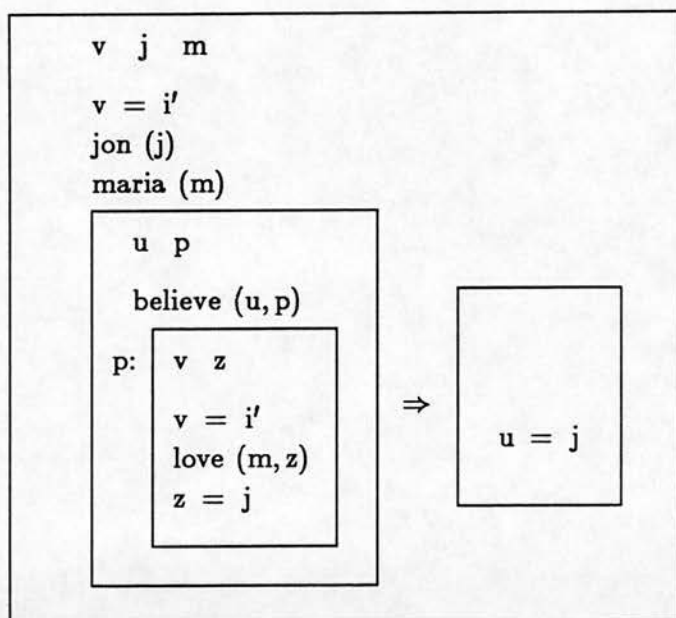
(50)a. Adeins Jon_i telur ad Maria elski hann_i.
Only Jon_i believes that Maria loves him_i.

b. Adeins Jon_i telur ad Maria elski sig_i.
Only Jon_i believes that Maria loves self_i.

If Jon believes that Maria loves Jon, and Olaf believes that Maria loves Olaf, (a) is true and (b) is false.

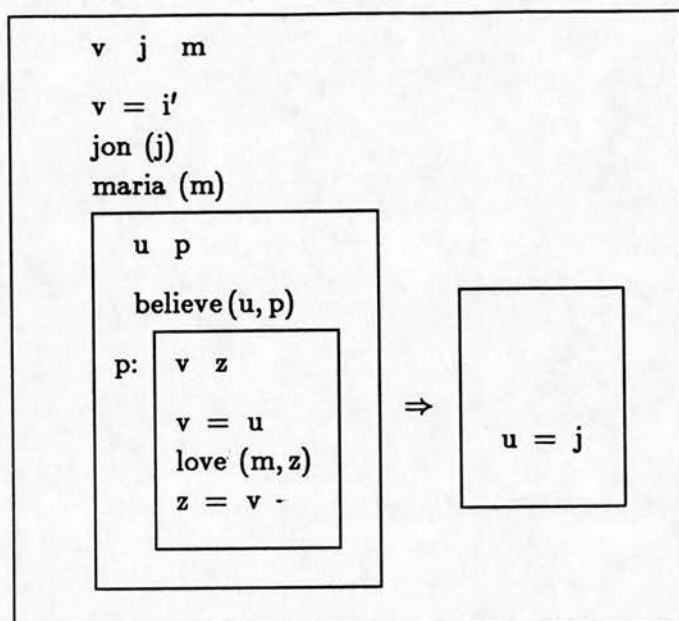
In my account, the distinct interpretations of these two sentences arise naturally from the mechanisms already described, without the need for stating any special constraints. The DRSs for the two sentences would be something like the following (satisfactory accounts for quantifiers like *only* are still to be developed; informally we treat *only x believes p* as, 'for all y that believe p, y is x'.)

(a)



²⁸ It may be possible to define the validator role wholly or partially in indexical/contextual terms; this also connects to the questions of accounting for direct and indirect speech which I have also ignored here.

(b)



6.6. Logophoricity and switch-reference

In the last two chapters, working within UCG, a grammar formalism which incorporates a DR Theory semantics, we have looked at two kinds of phenomena which both involve reference constraints across clause and sentence boundaries.

In chapter 5, it was argued that in order to handle switch-reference phenomena, an account is needed which meets the following specifications:

- (i) it has a way of distinguishing the subject NP referent of a following clause without having to know the subcategorisation frame of the verb of that clause.
- (ii) it can specify that this is not just the subject but an agentive subject.
- (iii) in order to account for functional extensions, it can make reference not just to the subject but also to information about mood and location.

To meet these specifications, we proposed that the index [a] for an eventuality be structured rather than simple, and introduced a structured eventuality index with the following form:

<Id, Aspect, Parameters>

|

<Protagonist, Location, Actuality>

Here, *Id* is an integer identifying the eventuality and from which its temporal reference can be determined, and *Parameters* is itself a triple <*Protagonist*, *Location*, *Actuality*>, where *Protagonist* is the protagonist of the eventuality (in Amele, the agentive/experiencer subject referent), *Location* is locational reference and *Actuality* is a parameter with possible values {actual, non-actual}.

In the present chapter, it has been argued that to handle logophoric systems, we need an account which incorporates a way of constraining the logocentric NP to be a validator as well as being either grammatical subject or highest on some thematic hierarchy. To do this, we introduced the additional mechanism of sorted validation DMs.

I will now attempt to draw together these two strands.

First, notice that the accounts given differ in their nature crucially due to the different syntactic relation between the clauses. Let us use the term 'marked clause' to mean the switch-reference marked clause or the logophoric context, and the term 'controlling clause' to mean the finite clause of a switch-reference relation or the matrix clause of a logophoric relation. The switch-reference systems we have looked at have involved either clause chaining structures, or adverbial clause adjuncts.²⁹ We have thus treated switch-reference marked clauses as **functors** which take a grammatically more fully specified clause as argument, and unify with it in certain respects. In contrast, logophoric systems invariably involve marked noun clauses which are the subcategorised for arguments of predicates, and the logophoric relationship crucially involves semantic characteristics of the predicate. We cannot treat the marked clause as a functor; it is treated as an argument.

However, in each case, the crucial NP in the controlling clause is the protagonist NP defined either just as subject, or just as agent, or as both. For switch-reference, we need to put this condition in the eventuality index because of the marked clause's status as a functor: we can't require too much of its argument. In fact, the same thing happened in accounting for logophoric contexts introduced by complementisers. Normally, however, with logophoricity, we do not need to do this because all the necessary information is

²⁹ Of course, there are some switch-reference systems in which marking is on relative clauses or complement clauses.

available within the sign for the functor which is the controlling clause. It could be that this difference is at the heart of the differing markedness characteristics which we noted for switch-reference and logophoricity. We said that for switch-reference, disjoint reference is marked, whereas for logophoricity, coreference is marked, and also noted that the two have different properties with respect to cases in which only one of the NPs is plural.

Further, in both cases, modality is important. For switch-reference, one of the things that can force use of DS marking even if the protagonists are coreferential, is a switch in the value for the parameter *Actual*, between {actual} and {non-actual}. For logophoricity, logophoric pronouns are coreferential with the clausal validator set up by the higher NP. We also saw that logophoric contexts are coextensive with contexts in which subjunctive mood is used.

We further noted that there is some evidence to suggest that logophoric systems may have the potential to develop into switch-reference systems. This is the hypothesis underlying Comrie's (1983) presentation of the Gokana data as a young switch-reference system. In addition, it is likely that something similar has happened in Imbabura Quechua, where one of the two switch-reference systems, a fairly recent innovation occurring only in this dialect of Quechua, is restricted to subjunctive noun clauses mainly embedded under predicates of the kind we have been calling logocentric (Cole 1982, 1983, Jake 1985).

It is straightforward to incorporate the account presented in this chapter into the one given for switch-reference in chapter 5.

First, we must include the validator in the structured eventuality index of the semantics for the clause rather than in the predicate conditions introduced by the clause. As we saw, assignment of the validator role involves a 'formal' condition rather than a 'descriptive' one, and in fact we have effectively been treating validation in this way in our definition of the function *val*, i.e. referring to it separately from the predicate conditions of the relevant DRS.

Second, we must clarify the relationship between the validator and the parameter *Actual* defined in chapter 5. We already suggested that this parameter may be useful in accounting for logophoric contexts triggered just by special complementisers. We can define the following biconditional for the languages we have looked at:

$\text{val}(a) \neq i' \iff \text{Actuality}(a) = \{\text{non-actual}\}$

This accounts for the restriction on use of logophoric pronouns to clauses with subjunctive mood in some languages, and also for the conditions of use of logophoric pronouns in languages in which they are optional.

In fact, it is 'with' the parameter *Actuality* that the validator belongs, since it too pertains to modality. So we define an inclusive parameter *Modality* which is a pair, $\langle \text{Actuality}, v \rangle$.

Then, the relevant generalisation is that logocentric verbs require:

$\text{Prot}(a_i) = \text{val}(a_j)$, where a_i is the index for the matrix clause and a_j is the index for the subordinate clause.

Having incorporated the account for logophoricity into the account proposed for switch-reference, we need to consider what implications this has for the account given for switch-reference.

In particular, the strong claim made in chapter 5 was that crosslinguistically, there is potential for using DS marking wherever some element of the eventuality index of one clause departs from that of the other clause. If we incorporate the validator into the eventuality index, the prediction is that DS marking may be used in some language in some cases where the two clauses differ just in having distinct epistemic validators. The sorts of cases where this would occur are, as we have seen, cases where the validator in one clause is the current speaker and that in the other clause is the agent/experiencer involved in an act of communication, or a mental, psychological or perceptual experience.

One way to constrain this might be to say that where the validator of the clause is not the current speaker, then no statement about actuality is made, or even that {non-actual} is implied; in contrast, though, it is not the case that {actual} entails that the validator is not the speaker. We saw that DS could be used if the clauses have distinct actuality values. This would cover some of the cases where they would have distinct validators: the only case it would not cover would be a case where both clauses were {non-actual}, but one had this value due to having a different validator, and the other for some other reason. We could deal with this difficulty by saying that a distinct validator implies no value for actuality. In such cases the two clauses would automatically have different actuality values whenever the validators were different. These kinds of predictions need testing against data from switch-reference languages which also have either logophoricity or a developed evidential system.

Conclusion

In this thesis, I have examined two types of clause linkage: switch-reference and logophoricity. Both involve restrictions on the anaphoric relation between a pivot NP in a dependent clause and a pivot NP in a controlling clause. Yet, I have shown that neither is amenable to an account in terms of syntactic binding. Furthermore, in both cases, functional extensions of the markers suggest that it is better to describe the systems as indicating relationships between clauses rather than simply between NPs.

I have proposed a formal account which captures this idea in a grammar formalism with a semantic component based on Discourse Representation Theory. The key element of the new account and the major theoretical innovation is the notion of **structured eventuality indices** incorporating eventuality parameters, and the idea that languages have formal devices to indicate agreement or dis-agreement between these indices. This gives formal expression to an intuition that there are global semantic and discourse-related properties of the eventualities introduced by clauses which are independent of the propositional content of the clause and which are important to the way the clause fits into the discourse structure.

The work reported contributes to our understanding of switch-reference systems in drawing together numerous reports of 'unexpected' uses of switch-reference from a wide range of languages and showing that these uses are similar and can be incorporated into a unified and coherent theory of the semantics of switch-reference markers. It contributes to our understanding of logophoric systems by making explicit the connections between logophoricity and modality, in particular the marking of evidential meaning. It also makes some progress toward determining the relationship between switch-reference systems and logophoric systems, and identifying the universal constraints on these systems.

More specifically, it provides additional support for a number of theoretical proposals which have been made by other researchers. These include the need for an 'animacy', 'agentivity' or 'thematic role' hierarchy such as has been proposed by numerous researchers, including Silverstein (1976), Jackendoff (1972) and Hellan (1986), and the usefulness of the notion of 'unaccusative verbs' as proposed by Perlmutter (1978) and further developed by many investigators. In addition, the work in this thesis suggests that a rather sophisticated notion of aspectual classification and textual structure is necessary, and so supports work by Zeevat (1987), Webber (1987) and Moens (1987), as well as work on

transitivity from a rather different theoretical standpoint, by Hopper & Thompson (1980).

Clearly, a good deal of research remains to be done on the topics covered in the thesis. I consider the following questions to be the most important to pursue on the basis of the work reported here.

First is the interaction between impersonal constructions and switch-reference. It would be useful to have data for a greater number of languages on which to base crosslinguistic generalisations: just how common is it for switch-reference systems to treat impersonal controlling clauses as triggering SS marking? More importantly, there is the theoretical question of whether these seemingly aberrant uses of SS marking should be added to our list of diagnostics for unaccusative verbs, and whether current work on unaccusativity can shed any light on the account we should give for the switch-reference pivot in such languages. These questions were touched on in the thesis but need further theoretical investigation. Finally we must ask what the interaction is between the impersonals phenomena, which clearly implicate a notion of agentivity, and the kind of functional extension of switch-reference marking which occurs in Eastern Pomo, which also implicates a notion of agentivity and indeed unaccusativity, since Split-S marking is taken to be an indication of this.

A related point is that the ideas presented in the Appendix about verb orientation in Amele should be followed up. Even if the orientation distinction turns out to be unconnected to the behaviour of the switch-reference system in that it does not explain unexpected uses of DS marking, it does seem related to unaccusativity, and that in itself raises interesting questions about the interaction between this phenomenon and impersonal constructions in Amele. What is the 'object marker' which occurs on some seemingly intransitive Amele verbs? Can an unaccusativity analysis help us explain it?

The second major question to be pursued is the relationship between switch-reference and logophoricity, and the analysis of the latter. Many interesting typological and diachronic questions would be illuminated by a more systematic examination of languages in which both kinds of system are reported to occur than I have had scope for in this thesis. Again, further work needs to be done on the theoretical mechanisms proposed to account for logophoricity in chapter 6. Is the concept of the **validator** more generally useful? Research on evidential markers and on verbs of propositional attitude may go some way towards answering this question. I also mentioned that additional thought was needed on the semantic basis for DR Theory and the semantic interpretation of the validator DM;

in connection with this possible alternative analyses involving an account for direct/indirect speech and indexicality may be explored.

Finally, we need to consider what other grounding and motivation there is for the notion of the structured eventuality index. Again, it would be useful to have more extensive crosslinguistic data from switch-reference languages on other cases which might be seen as involving functional extensions of DS marking of the kind the structured eventuality index was designed to handle. We also need to consider the place of such an account for switch-reference within a broader notion of DR Theory, which includes such matters as anaphoric resolution and text cohesion. The account suggested in chapter 5 for cases of unexpected DS marking indicating episodic completion deserves much more detailed consideration. I noted the close association between nominal and temporal cohesion indicated by switch-reference systems and pointed to the foregrounding and backgrounding functions they may have throughout a text as possible explanations for the way they interact. A lot more work needs to be done on this, and we need to see whether the information encoded for each indexed clause in my account of switch-reference can feed into text level notions in a relatively direct way.

Appendix

'Agent-oriented' and 'goal-oriented' verbs in Amele.

Object agreement facts in Amele are complex (Roberts 1987:278ff.). Agreement marking for direct and indirect objects is restricted to animate NPs. Furthermore, verbs are distinguished according to whether object agreement marking is obligatory, optional or disallowed. The range of possibilities is represented in the following diagram.

object agreement marking obligatory	I
object agreement marking optional	II
object agreement marking disallowed	III

Verbs of Type I, which require object agreement marking, include verbs where the subject causes a physical change to the object, such as *peel, tear, burn, embrace*, or where the subject has a psychological effect on the object, such as *provoke, bless, desire*. Collective/reciprocal predicates and idiomatic expressions with an incorporated object are also included in this class. In general, the object is the experiencer of the action or state.

Verbs of Type III, which prohibit object agreement, are verbs whose subject undergoes a physical or psychological experience: verbs of motion or location such as *return, lie, follow*; verbs of physical change such as *open mouth, vomit, blush*; and verbs of psychological state such as *be proud, fear, yearn*. Here, the subject participant is the experiencer of the action or state.

Verbs of Type II are ones in which object agreement may or may not occur depending upon whether there is an animate object. They include some which describe the subject as bearing a psychological attitude to the object, such as *forgive, hate, confess to*, and some in which the subject affects the object physically, such as *untie, poke, wrap*.

Of verbs describing linguistic acts, some are Type I and others are Type III, possibly depending on the extent to which the act has an implicit product.

The interesting fact about this classification of verbs is that it seems to be independent of the verb's valency. Verbs of Type I, which require object agreement, may actually be 'intransitive', with only one semantic argument and hence no overt object NP. Similarly,

verbs of Type III, which prohibit object agreement, may actually be 'transitive', with two semantic arguments and an overt object NP.

Roberts (1987:289) suggests that these facts can be explained if we assume that Amele grammar incorporates a distinction between 'goal-oriented' and 'agent-oriented' verbs independent of the distinction between transitive and intransitive verbs. Goal-oriented verbs are ones where the effect of the action is on the participant referred to by the object NP, while agent-oriented verbs are ones where the effect of the action is on the participant referred to by the subject NP. The claim is that object agreement marking indicates goal-orientation, and lack of object-agreement marking indicates agent orientation. Evidence for this distinction is provided by two kinds of minimal pairs. In the first type, the verbs have similar meanings but different orientation. See the examples in (1). In each pair the first verb is goal-oriented and must take object agreement and the second verb is agent-oriented and may not take object agreement.¹

- (1) (a) *isicol-doc* *filicit-ec*
 to surprise someone to be surprised
- (b) *lahi-doc* *qelet-ec*
 to shake someone to tremble
- (c) *tuli-doc* *seel-ec*
 to wake someone up to awake

The second type of evidence involves verbs of Type II. The same verb is used with different meanings depending on whether or not it takes object agreement, i.e. on its orientation. See the examples in (2). Again, in each case the first member of the pair is goal-oriented and takes object agreement while the second is agent-oriented and does not take object agreement.

- (2) (a) *basec-doc* *bas-ec*
 to give birth to pour out

¹ Verbs with different orientation are also distinguished by the form of the infinitival ending they take, with goal-oriented verbs taking *-doc* and agent-oriented verbs taking *-ec*.

- (b) fulul-doc fulul-ec
 to flap (wings) to fly
- (c) wilic-doc wilic-ec
 to stir (something) to wag

There are obvious analogies between this pattern of object marking and the Split-S marking which occurs in languages such as Eastern Pomo, and it may be that a notion of unaccusativity will be useful in accounting for these facts grammatically. My concern here is whether there is any interaction between the proposed orientation distinction and switch-reference marking. It was noted in chapter 5 that certain difficulties arise in trying to match the data involving unexpected uses of DS marking with an analysis of the kind that Roberts suggests. In effect, in a few examples, it is not clear why DS marking is used, because although there does seem to be a change in time, place or mood in the clause, the change does not happen on the unexpectedly DS marked verb, as it does in the other examples we looked at. The reader is referred to section 5.4.2 for discussion of this difficulty, especially with respect to examples (38) and (39), which are repeated below. There are various possible explanations for it, some of which were mentioned there. The hypothesis to be explored here is that an interaction between syntactic orientation of verbs and switch-reference marking might explain the full range of cases of unexpected DS marking, including these puzzling examples.

- (38) Od-i-me-ig eu na cuha **fe-ce-bil**
 do-PRED-SS-2p that of Sunday **see-DS-2p**
- hib na age meen qaig gaban-du-me-ig
 later 2p stone shoot gather-3s-SS-2p
- ihoc f-i-me-ig ...
 enough see-PRED-SS-2p ...

Do that and then later take a look and you will see that the money you have collected will be enough ... [304, (619)]

- (39) Aria meme-g eu mado-n, "Cois
 all right father-3s that say-3s-RemP OK
- eu **mado-co-min** l-ig eh-i l-i
 that **say-DS-1s** go-(SS)1s take-(SS) go-(SS)

m-ih-ig-en," put-2s-1s-Fut	d-on. say-3s-RemP	Odo-co-b do-DS-3s	li-me-i go-SS-3s	dana man
co mouth-3s	cafa close	q-oc hit-INF	eu that	mado-n, say-3s-RemP
"Cois OK	caja woman	eh-i take-(SS)	l-i go-(SS)	
m-ud-ih-ig-en," put-3s-2s-1s-Fut	do-n. say-3s-RemP			

All right the father told her, "OK I say I will take you and give you to him." Then he went to the man with the closed mouth and told him, "OK I will bring the woman and give her to you." [305, (627)]

The hypothesis is that DS marking might sometimes be used to indicate a switch in the orientation of the verb, rather than a difference in any other characteristics of the clause, such as different subject reference, or any of the other possibilities which we considered. There is a strong form and a weak form of the hypothesis: on the strong form, we might expect to be able to account for all aberrant uses of DS in this way, and not need to make recourse to mentions of time, place and mood at all; on the weak form, we could include switch in orientation as just one of the factors which might trigger DS marking, along with the others already identified.

The possible combinations of verb-orientation which we would expect to find are the following:

	clause 1	clause 2
(a)	agent	agent
(b)	agent	goal
(c)	goal	agent
(d)	goal	goal

For each of the four cases, there is the further parameter of variation that the subjects of the two clauses may either be coreferential or have disjoint reference. Assuming for the moment that there are no other factors which interact to trigger unexpected markings of

switch-reference, i.e. ignoring the possibility that time, place and mood intervene, the following logical possibilities exist:

(1) Switch-reference operates just in terms of co/disjoint reference and there is no interaction with orientation; in which case we would expect to find both SS marking and DS marking for each of the above cases, entirely dependent upon whether there was coreference or not.

(2) If SS indicates same orientation and DS indicates different orientation, then we would expect cases (a) and (d) to trigger SS and cases (b) and (c) to trigger DS; but it seems unlikely that switch-reference would operate just in terms of orientation (in fact as we shall see it does not), and a more likely possibility would be to expect something like what happens in Eastern Pomo, i.e. SS indicates coreference and same orientation, and DS indicates disjoint reference and/or different orientation. So we would expect to get the following pattern:

SS: agent agent; coreference
goal goal; coreference

DS: agent agent; disjoint reference
goal goal; disjoint reference
agent goal; coreference
agent goal; disjoint reference
goal agent; coreference
goal agent; disjoint reference

We would anticipate the 'unexpected' cases of DS marking to all fall into one of the following two patterns:

1. agent goal; coreference
2. goal agent; coreference

We test whether the strong or weak form of the hypothesis is correct as follows. For the strong form to be correct, we would expect to find that not only do all cases of unexpected DS marking fall into one of these two groups, but all cases which exhibit one of these two patterns take DS marking. For the weak form to be correct, neither of these would need to be the case, but we would expect that at least some of the difficult examples of unexpected DS marking which we could not account for any other way would fit one of the two patterns above, and we would expect to find some greater than random correlation between orientation and switch-reference marking (i.e. an uneven distribution of SS and DS marking vis-à-vis same/different orientation).

I looked again at all the examples of aberrant DS marking which appear in Roberts (1987,

1988), which represent a total of 29 cases of switch-reference relations. Of these, 13 had unexpected DS marking. As we saw above, for a few of these cases, it was difficult to establish what was triggering DS marking.

Out of these 29 cases, 19 conformed to the hypothesis that DS would be used if there was a switch in verbal orientation, regardless of whether the subjects of the two clauses were coreferential or not. This is roughly 65.5% of cases, which indicates a pattern which is not random. If we check the examples for whether or not they conform to the canonical hypothesis that SS indicates coreference and DS disjoint reference, we find that 16 out of 29 do, so the orientation hypothesis actually does rather better than the canonical theory, although the difference between the two is probably not statistically significant, and the sample of data used is biased because it concentrates mainly on cases which *don't* conform to the canonical theory. The account of unexpected DS marking which was described in chapter 5 still covers the fullest range of cases, however, since only the few puzzling examples mentioned there do not conform to it.

Assuming that a weak version of the orientation proposal is true the expectation is that at least the puzzling examples which do not seem to fit the theory in chapter 5 will be among the 19 which conform to the hypothesis that DS indicates a switch in orientation. Unfortunately this is not the case.

The numbers of examples of each type of pattern which occurred were as follows:

A-A : 11 (38%)
G-G : 1
A-G : 8 (27.6%)
G-A : 9 (31%)

If we look at the 10 cases which do not conform to the orientation hypothesis we find that examples of all four patterns occur. Some of these are cases which actually do fit the canonical theory.

We could modify our hypothesis to say that when there is coreference, and no switch in orientation, SS must be used, and when there is disjoint reference, regardless of orientation facts, DS is used, but when there is coreference but a switch in orientation, either SS or DS may be used. This modified hypothesis accounts for 6 of the 10 counterexamples (i.e. those where SS was used where there was coreference even though there was a switch in orientation).

This leaves us with four counterexamples, which are all cases where DS is used unexpectedly, because there is coreference, but we can't account for this by saying that DS is used because there is a switch in orientation, because there is not in fact a switch in orientation. In this brief report of results I will not discuss these examples in detail, but two of them are actually somewhat problematic for other reasons.

For comparison, the following figures give the breakdown of the number of agent-oriented verbs which occurred in this sample in total, as against the number of patient-oriented verbs which occurred: out of 51 verbs, 32 (63%) were agent-oriented, and 19 (37%) were patient-oriented. It is not surprising that there are more agent-oriented verbs. Note that the proportion of agent-oriented verbs to patient-oriented verbs is roughly the same as the proportion of cases which fit the theory to cases which do not; whether this is significant is not clear at this stage.

What conclusions can be drawn from this brief preliminary investigation? In the absence of further data all that can be said is that the theory proposed here is worth following up, and that it is certain that there is some interaction of orientation with switch-reference marking which is available as an explanation of unexpected DS marking in some cases, including a number of cases which cannot be explained by the theory outlined in the rest of this chapter. This having been said, given the restricted data and the fact that a strong version of the orientation hypothesis fails, there seems every reason to retain the analysis proposed in chapter 5 whereby DS is triggered by some change in the parameters of the eventuality. Further investigation of verb orientation in Amele may show that these cases can be accounted for using some notion of control such as that postulated in the account for Eastern Pomo.

References

Abbreviations used:

BLS = Proceedings of the Annual Meeting of the Berkeley Linguistics Society.
CLS = Proceedings from the Regional Meeting of the Chicago Linguistic Society.
NELS = Proceedings of the Meeting of the North East Linguistic Society.
WCCFL = Proceedings of the West Coast Conference on Formal Linguistics.

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