NESTED PATHS IN SYNTACTICALLY ERGATIVE LANGUAGES

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1. Ergativity*

The term *ergativity* refers to the way in which the direct arguments of a verb are grouped together. In an ergative language, the intransitive subject (S) and the object of a transitive verb (O) form a natural class, excluding the transitive subject (A).[1] The most common manifestation of this grouping is in the Case and agreement systems. Consider the following examples from Dyirbal and Inuit in (1) and (2), respectively, which exhibit ergativity in their systems of Case. In the transitive examples in (a), the A argument has ergative Case, and O has nominative (also known as absolutive) Case. In (b), the S argument appears with nominative Case, the same Case as the O in (a).[2]

(1) *Dyirbal*
a. ŋuma-ø yabu-ŋgu bura-n
father-Nom mother-Erg see-Nonpast
'Mother saw father'
b. ŋuma-ø banaga-nʸu
father-Nom return-Nonpast
'Father returned' (Dixon 1979: 61)

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(1) The letters *A, S* and *O*, introduced in Dixon (1972) and now standard in the ergativity literature, represent the three direct arguments of a verb: the transitive subject, intransitive subject and object, respectively. Corresponding roughly to *Agent, Subject* and *Object*, they constitute a mixture of semantic and syntactic terms, as two different terms are required for the transitive and intransitive subjects.

(2) The following abbreviations are used in the glosses: 1/2/3=first/second/third person, Acc=Accusative, All=Allative, AP=Antipassive, Compl=Complete, Dat=Dative, Det=Determiner, dir=directional, E(rg)=Ergative, f=feminine, Fut=Future, Imperf=Imperfect, Incomp=Incomplete, Ind=Indicative, Intr=Intransitive, Loc=Location, m(asc)=masculine, neg=negation, Nfut=Nonfuture, N(om)=Nominative, Pl/p=plural, Part=Participle, Perf=Perfective, prog=progressive, Real=Realis, Rel=Relativizer, rec=recent past, s=singular, suff=suffix, Tr=Transitive.

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(2) *Inuktitut (Inuit)*
a. Jaani-up tuktu-ø malik-p-a-a
John-Erg caribou-Nom follow-Ind-Tr-3sE.3sN
'John followed the caribou'
b. Jaani-ø pisuk-p-u-q
John-Nom walk-Ind-Intr-3sN
'John walked'

In the examples from Mam in (3), ergativity is exhibited in the agreement system. The nominative agreement markers for the S and O arguments are identical, while ergative A agreement appears in a different form.

(3) *Mam (Mayan)*
a. ma ch(i)-ok t-tzeeq'an
rec 3pN-dir 3sE-hit
'he/she/it hit them'
(England 1983: 62)
b. ma chi b'eet
rec 3pN walk
'they walked'
(England 1983: 58)

In an accusative system, on the other hand, A and S are grouped together, excluding O. This is shown with Case in Japanese (4), and with agreement in Chickasaw (Muskogean) (see (5)). In these examples, the A and S arguments appear with the same Case or agreement, different from that of O.

(4) *Japanese*
a. Jon-ga hon-o yon-da
John-Nom book-Acc read-past
'John read the book'
b. Jon-ga ki-ta
John-Nom come-Past
'John came'

(5) *Chickasaw (Muskogean)*
a. has-sa-shoo-tok
2pN-1sAcc-hug-Past
'you all hugged me'
(Payne 1982: 353)
b. hash-malili-tok
2pN-run-Past
'you all ran'
(Payne 1982: 354)

Many different types of theories have been proposed within the GB framework to account for the differences between ergative and accusative languages. The earliest analyses within this framework (de Rijk 1966 and Marantz 1984) proposed that the projection of arguments in transitive clauses was reversed in ergative and accusative languages. In accusative languages, following standard assumptions of syntactic structure, the A argument is base-generated as the daughter of S/IP, with O appearing in the VP. In ergative languages, on the other hand, it was claimed that O is the daughter of S/IP, and the A is generated within the VP. The grouping together of S and O with respect to Case and agreement results from their appearing in the same position, i.e., as immediate constituents of S. De Rijk (1966) attributed the difference in argument projection to the selectional restrictions of the transitive verb. For Marantz (1984), the reversal of A and O in ergative and accusative languages occurs at the level of corres-

pondence between semantic roles (Agent/Patient) and grammatical relations (subject /object). Although Marantz assumed that Case assignment is identical in the two language types, the opposite d-structure representation of Agent and Patient as subject or object results in different NPs receiving the same Case. For both de Rijk and Marantz, an intransitive clause has the same d-structure in both language types.

In the next development of comparative theories (e.g. Levin and Massam 1985, Marantz 1991), identical d-structure representations are proposed for both transitive and intransitive clauses in the two types of languages. This has the advantage over the previous theories of maintaining Baker's (1988) UTAH or Perlmutter and Postal's (1984) Universal Alignment Hypothesis. In contrast to Marantz's (1984) analysis, where ergative and accusative languages differ in their d-structures but not Case-assigning mechanisms, in Levin and Massam (1985) and Marantz (1991) the two types of languages have the same d-structure, but different methods of Case assignment. For Levin and Massam, transitive arguments are assigned Case in the same way in the two language types: the A in Spec IP receives Case (ergative or nominative) from I, and O receives absolutive or accusative Case from V.[3] Differences appear in the intransitive paradigm, when there is only one argument (S in Spec IP) receiving Case. In ergative languages S is assigned absolutive Case by V, while in accusative languages S is assigned nominative Case by I.[4]

Marantz's (1991) analysis makes opposite claims regarding the Case mechanisms in ergative and accusative languages. For Marantz, Case-marking in intransitive clauses is the same in the two language types, while differences arise in the transitive paradigm. His proposal is that in ergative languages the morphological realization of the Case of V+I (ergative) is assigned upward to A, while in accusative languages the accusative Case of V+I is assigned downward to O. In both ergative and accusative languages, nominative Case is assigned upward to S in intransitive clauses.

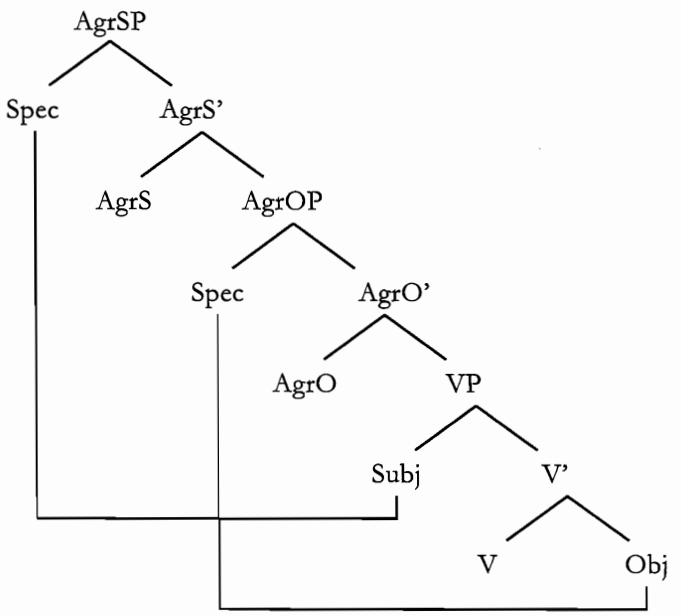
The most recent analyses investigating the ergative/accusative distinction have the advantages of Levin and Massam (1985) and Marantz (1991) in assuming similar d-structure representations in the two language types, while also maintaining an association between Case and structural position. This is possible because of developments in GB theory that permit arguments to move from their base-generated positions within the VP to other projections where they are assigned Case. Analyses such as Mahajan (1990), Bobaljik (1992), Campana (1992), Chomsky (1993), Murasugi (1992), Bittner (1994), O'Herin (1995) and Bittner and Hale (1996) all assume that universally S, A and O are base-generated in the VP, and that it is the movement of NPs to Case positions that distinguishes ergative from accusative languages. In an accusative language, S and A move to the same position, while in an ergative language, it is S and O that appear in the same Case position. These

(3) Note that in Levin and Massam's analysis, nominative and absolutive are different Cases, the former assigned by I, and the latter assigned by V.

(4) S receives the obligatory Case associated with the language type. Levin and Massam propose a Case Parameter that determines the obligatory Case: the Case of V in ergative languages, and the Case of I in accusative languages.

analyses may be classified into two categories: (i) those that assume that in ergative languages A raises higher than O, and (ii) those that assume that O in these languages raises higher than A. In the first category are analyses such as Bobaljik (1992) and Chomsky (1993), who claim that transitive clauses in both ergative and accusative languages have the "Crossing Paths" structure shown in (6a), where A raises to the higher functional projection, AgrSP, and O raises to the lower projection, AgrOP (see also Albizu this volume).[5]

(6)



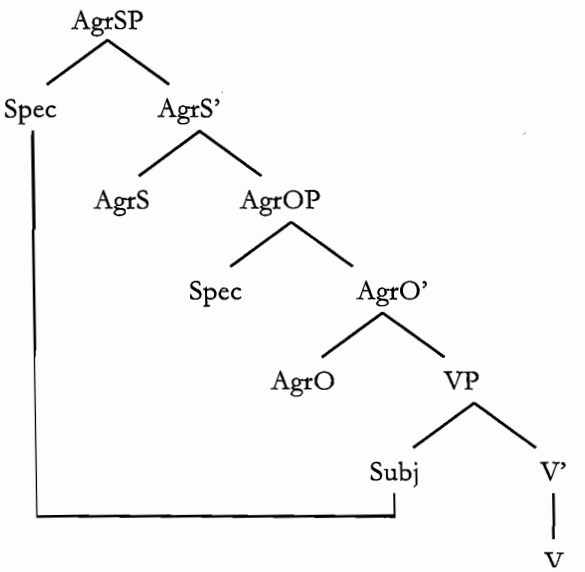
For Bobaljik and Chomsky, the difference between the two types of languages is manifested in the intransitive paradigm. In an accusative language, S raises to Spec AgrSP, the same position as A (see (7a)). However, in an ergative language, S raises only to Spec AgrOP, as shown in (7b).

The theories in the second category (e.g. Mahajan 1990, Campana 1992, Murasugi 1992, Bittner 1994, O'Herin 1995 and Bittner and Hale 1996) claim that it is in the *transitive* paradigm that ergative and accusative languages differ. In an intransitive clause the S argument raises to Spec AgrSP (or the equivalent) in both types of languages (as in (7a)). In transitive clauses, however, the A and O arguments appear in different positions in the two language types. In an accusative language A appears higher than O, while in an ergative language, O is in a position higher than A. The various theories in this category differ in the details of syntactic structure and assumptions about NP movement. Bittner (1994) and Bittner and Hale (1996), for example, assume that the A argument remains in the VP, and have O raising to the one functional category projecting from the VP. In Campana (1992)

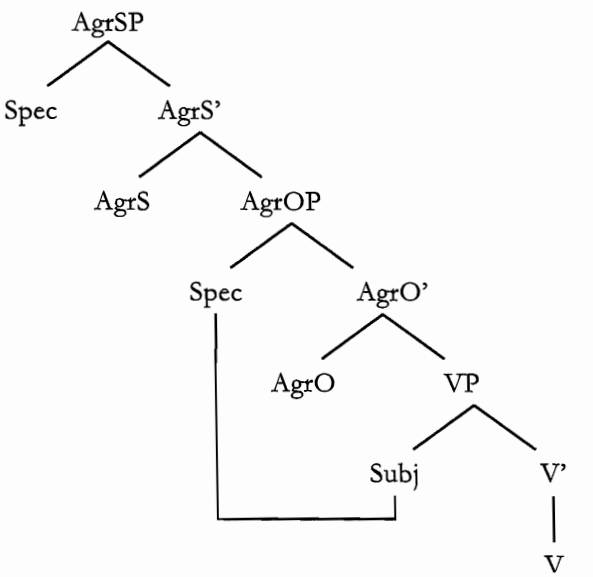
(5) The structures in (6) and (7) are simplified versions of those found in Bobaljik (1992) and Chomsky (1993). More specifically, they do not show the TP projection.

and Murasugi (1992) the A and O arguments both raise to functional projections outside the VP. What all the theories have in common is their claim that in ergative languages O is higher than A at some point in the derivation.

(7) a.



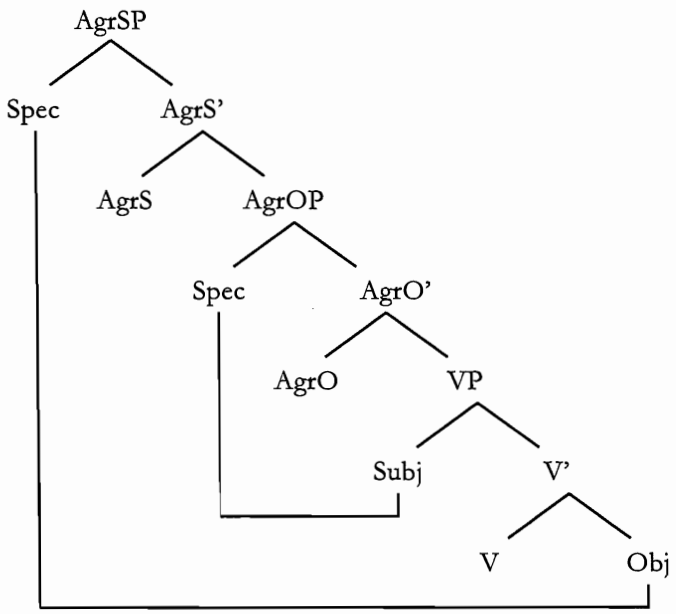
(7) b.



The analysis in the present paper belongs to this second category of theories. In both ergative and accusative languages, the A and O arguments are generated in the same positions within the VP. Following Chomsky (1991), I assume that both arguments must

raise out of the VP to the Spec of functional projections in order to fulfill Case requirements. In accusative languages, as in standard analyses of NP movement, the NPs exhibit Crossing Paths movement, as shown in (6a) above. The central claim of this paper is that in ergative languages, the movement of the A and O arguments is reversed: A raises to the lower functional projection, while O raises to the higher one. This type of movement, called "Nested Paths", is shown in (8) (although as discussed in section 2 below, I assume different category labels for the functional projections).

(8) Nested Paths



Languages that exhibit this type of movement, with O higher than A, will be referred to as *syntactically ergative* languages. In section 3 below I provide evidence from verbal agreement, scope and participial relatives for Nested Paths movement in syntactically ergative languages such as Inuit and Dyirbal.

The analysis in this paper does not attempt to account for all languages that exhibit ergativity in their Case and/or agreement systems. Languages vary in the degree to which they exhibit ergative properties, making it difficult for one theory to accommodate all such languages. Theories of ergativity within the generative framework have generally focused on a particular ergative language or particular type of ergative language. For example, Johns (1987, 1992), Bok-Bennema (1991) and Bittner (1994) focus on Inuit, and O'Herin (1985), on Abaza, two syntactically ergative languages. Marantz (1984), Campana (1992), Murasugi (1992) and Bittner and Hale (1996) investigate several syntactically ergative languages including Inuit, Dyirbal and Mayan. Two analyses of morphologically ergative languages (i.e., those that appear to have no *syntactic* properties that group together S and O) are presented in Laka (1993) for Basque, and Levin and Massam (1985) for Niuean.

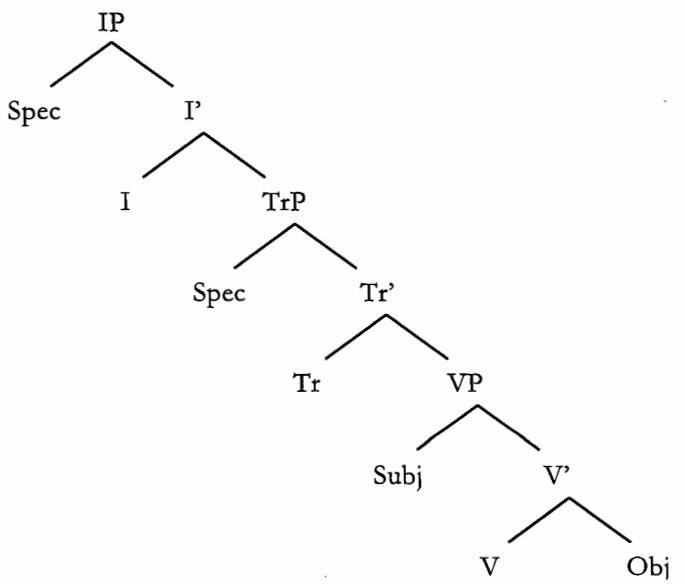
Languages that exhibit split ergativity based on tense and aspect (e.g., Georgian and Hindi) are investigated in Marantz (1991). Jelinek (1993) and Jelinek and Demers (1994) present an analysis of Straits Salish, which exhibits split ergativity along a person hierarchy. The Papuan language Yimas, another language with a split ergative system based on person, is examined in Phillips (1993). Following in this tradition, the present paper addresses only a particular class of ergative languages, i.e., syntactically ergative languages such as Inuit and Dyirbal, where O appears in a position higher than A.

The organization of the paper is as follows. In section 2 I introduce a structure for clauses that differs from Chomsky (1991, 1993) in the functional projections associated with Case and agreement. In section 3 I provide arguments from verbal agreement, scope and participial relatives in support of the Nested Paths structure in (8) for ergative languages such as Dyirbal, Inuit and Mayan. I provide a theoretical account of Nested Paths in section 4, based on the economy principle of Shortest Movement. I discuss Crossing Paths in accusative languages in section 5, claiming that this type of movement results from the Case-assigning properties of the verb. An ergative parameter that distinguishes ergative from accusative languages is presented. In section 6 I discuss Superiority in accusative languages, which exhibits Nested Paths movement as Case is not of relevance.

2. The Tr Projection

Shown in (9) is the structure I propose for clauses universally.

(9)



I assume the VP-internal subject hypothesis, where subjects are generated within a maximal VP projection (see Fukui 1986, Fukui and Speas 1986, Kitagawa

1986, Kuroda 1986, and Koopman and Sportiche 1987, among others). I also adopt Chomsky's (1991, 1993) proposal that both subject and object Case and agreement involve a Spec-head relation between a functional head and its specifier. This entails that the subject and object NPs in the VP must raise to the specifier positions of the functional categories to satisfy Case and agreement requirements.

The two functional projections associated with Case and agreement are IP and Tr(ansitivity)P. Unlike the proposals in Pollock (1989) and Chomsky (1991, 1993), I do not assume that an agreement node heads its own projection. Rather, I return to Chomsky's (1981) notion of the "dualheadedness" of Infl that was standardly assumed until Pollock's (1989) proposal. In the traditional analysis, Infl consists of the feature [Tense], and Agr features for person, gender, number, etc. I follow Halle and Marantz (1993) in assuming that Agrs are adjoined to functional heads.[6]

Pollock (1989) proposed that IP be separated into two projections, TP and AgrP, reflecting the dual nature of this inflectional category. He provided evidence from verb movement in French and English that a structural position between VP and IP (i.e., AgrP) was necessary. However, as noted by Chomsky (1991), this AgrP projection could be analyzed as the category relating to object agreement, unifying Pollock's structural requirements for such a position, and Kayne's (1989) proposal of an object agreement position for French past participles. With Agr associated with the object, there is no need for two inflectional projections for the subject. Pollock's TP, then, can remain the locus of subject Case and agreement, as was the case with IP in earlier systems.

Parallel to the dualheadness of tense and agreement, I propose that object agreement is also associated with a functional head, Tr(ansitivity). This TrP projection is similar to Chomsky's AgrOP in that it is associated with object Case and agreement, but rather than being a projection of agreement, it is headed by a feature of the verb.[7] Unlike tense, which has semantic content, the notion of transitivity proposed here is not semantic, but strictly structural. The [trans] feature is the structural realization of the number of direct arguments in the VP. A verb with two arguments projects [+trans] Tr, while a verb with one argument projects a [–trans] Tr. Whether the one argument has object-like properties, as with unaccusative or passive verbs, or subject-like properties as with unergative verbs, is not of importance.[8]

(6) This means that in languages which may be lacking Agr, such as Chinese and Japanese, only the adjoined Agr head is absent, and not an entire (AgrP) functional projection.

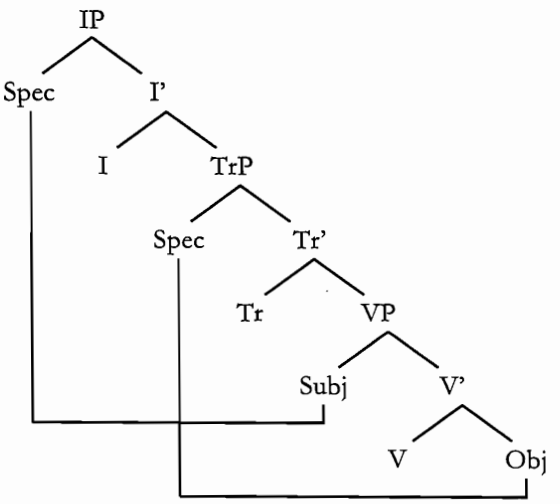
(7) Jelinek (1993) and Jelinek and Demers (1994) provide evidence from Straits Salish for a functional category involving a transitivizing head. In Inuit, a morpheme indicating transitivity is affixed to verbs: *-u* for intransitive verbs, and *-a* for transitive verbs.

(8) There is also a semantic notion of transitivity, which is a lexical, and not syntactic, property of the verb. Hopper and Thompson (1980), for example, claim that transitivity is associated with several components, all concerned with the effectiveness with which an action takes place, e.g., the telicity and punctuality of the verb, the volitionality and agency of the subject, realis or irrealis mode, and the degree of affectedness and individuation of the object. It is not clear how such properties are captured syntactically, especially in terms of satisfying the Case requirements of the object, which is the role of Tr.

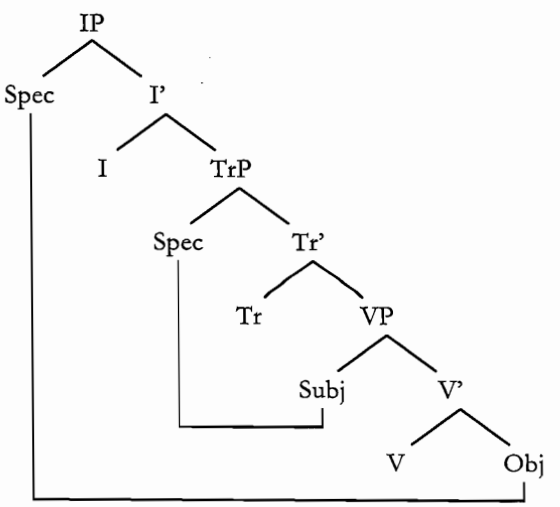
3. Nested Paths in Syntactically Ergative Languages

Inuit, Dyirbal, Mayan and Abaza are all languages that exhibit an ergative system of Case or agreement. In this section I provide evidence that such languages are syntactically ergative, that is, they exhibit Nested Paths movement. I discuss various phenomena such as the order of verbal agreement morphemes, scope facts and participial relatives that support an analysis where the O argument raises to a position higher than A in ergative languages (see (10a)), and to a lower position in accusative languages (see (10b)). (10c) illustrates where the S argument appears in both ergative and accusative languages.

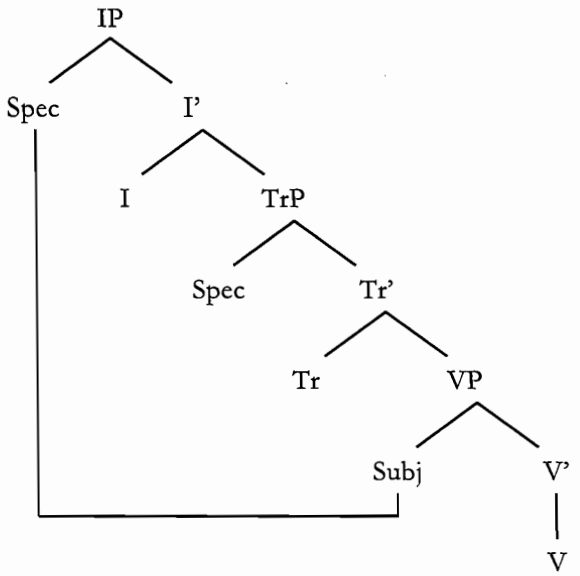
(10) a. Crossing Paths: Accusative Languages



b. Nested Paths: Ergative Languages



c. Intransitive Clauses: Ergative and Accusative Languages



The positioning of the arguments in (10a-c) is reflected in the Case that appears on the NPs. I assigns nominative Case to the argument in Spec IP, which in an ergative language corresponds to S and O. The A argument is assigned ergative Case in Spec TrP. In an accusative language, I assigns nominative Case to S and A, and Tr assigns accusative Case to the O in its Spec. The names "nominative", "absolutive", "accusative" and "ergative" are simply labels used to identify the Cases associated with I and Tr in the two types of languages. I is associated with the unmarked Case in both language types, and Tr, with the marked Case. The unmarked Case is the form generally used for citation, and the one most likely to be morphologically null. These properties are shared by the nominative in accusative languages, and the absolutive in ergative languages.[9] In constrast, accusative and ergative Case are usually the marked Cases morphologically. In this paper I refer to both nominative and absolutive as simply "nominative". However, in order to distinguish between the two types of languages, I refer to the marked Case as either "accusative" or "ergative".[10]

(9) See Dixon (1979, 1994), Bittner (1991) and Blake (1994) for further discussion of the unmarked status of nominative and absolutive Case.

(10) Since ergativity is most commonly found in the Case/agreement system, which may be considered to be morphological properties, it has been claimed that, except in a few rare languages such as Dyirbal, ergativity does not extend beyond the morphology to the syntax (see Anderson 1976, Comrie 1978, Dixon 1979, Levin 1983 and Marantz 1984 for discussion). It is well-known that in Dyirbal, the grouping together of S and O is not limited to Case and agreement, but is found in syntactic structures such as topic chaining and purposive clauses as well (see Dixon 1972, 1979, 1991). The evidence from ergative languages presented in sections 3.1 to 3.3 below shows that in the languages discussed (e.g. Inuit, Mayan and Dyirbal), the grouping together of S and O has syntactic consequences. Such evidence provides support for the analysis presented here that ergativity in such languages is based on a syntactic phenomenon, Move α.

3.1. Order of Agreement Morphemes

In languages that exhibit double verbal agreement in transitive clauses, the order of the transitive subject and object agreement morphemes are reversed in ergative and accusative languages. As observed by Bittner (1994), Campana (1992), Murasugi (1992) and O'Herin (1995), in an ergative language A agreement is closer to the verb than O agreement, while in an accusative language O agreement is closer than A agreement. Examples from two ergative languages, Inuktitut (Inuit) and Tzutujil (Mayan), are shown in (11) and (12). In these examples, A agreement appears closest to the verb.

(11) *Inuktitut*
malik-v-a-*a-nga*
follow-Ind-Tr-*3sA-1sO*
'he/she followed me'

(12) *Tzutujil*
n-*e7-a*-kamsa-aj
Incomp-*3pO-2sA*-kill-suff
`you kill them'

(Dayley 1985: 83)

Other ergative languages exhibiting the same order of agreement morphemes are Warlpiri (Hale 1983), the Caucasian languages Abaza (O'Herin 1995), Archi (Kibrik 1979) and Abkhaz (Hewitt 1979), and other Mayan languages such as Mam (England 1983) and Tzotzil (Aissen 1987).

In the accusative examples in (13) and (14), from Chichewa (Bantu) and Chickasaw (Muskogean), respectively, O agreement is closer to the verb than A agreement.

(13) *Chichewa*
njûchi *zi*-ná-*wá*-lum-a alenje
bees *3pA*-Past-*3pO*-bite-Ind hunters
'the bees bit them, the hunters'
(Bresnan and Mchombo 1987: 744)

(14) *Chickasaw*
has-sa-shoo-tok
2pA-1sO-hug-Past
`you all hugged me'

(Payne 1982: 33)

Other accusative languages following this pattern include additional Bantu languages such as Setawana (Demuth and Johnson 1989) and Kiyaka (Kidima 1987), Pawnee (Caddoan; Parks 1976), Yavapai (Yuman; Kendall 1976), Tuscarora (Iroquoian; Williams 1976), Kiowa (South Plains; Watkins 1984), Pipil (Nahua; Campbell 1985), and Daga (Papua New Guinea; Murane 1974).

Agreement is a relation between a bundle of θ-features under an Agr node and an NP in the specifier position associated with Agr. It involves a Spec-head relation, regardless of whether the Agr node is part of a functional head such as Infl, as in the traditional analysis of Chomsky (1981) and also assumed here, or heads its own projection (as in Pollock 1989, Chomsky 1991). Verbal agreement involves head-to-head movement of the verb to Tr, and subsequent raising of the V+Tr complex to I. The order of subject and object agreement morphemes on the verb reflects the order in which agreement is triggered as the verb moves from one functional head to the next.[11] Let us assume some version of Baker's (1985) Mirror Principle (also

(11) Within the "checking theory" of Chomsky (1993), where the verb is base-generated with agreement features, the order in which the features are checked would correlate with the hierarchical structure of the corresponding NPs.

Gerdts' 1981 Satellite Principle), where the order of morphemes correlates with syntactic derivations.

(15) *Mirror Principle* (Baker 1985: 375)
Morphological derivations must directly reflect syntactic derivations (and vice versa).

Agreement is triggered first by the NP in Spec TrP when the verb raises to Tr, and then by the NP in Spec IP when the V+Tr complex raises and adjoins to I.

The different patterns of verbal agreement in ergative and accusative languages result from different NPs appearing in Spec TrP and Spec IP in the two language types. In both types, the agreement associated with Tr (i.e., accusative/ergative) is closer to the verb than the nominative agreement of I. In an ergative language, agreement occurs first with the A argument in Spec TrP, and then the O in Spec IP, resulting in A agreement appearing closer to the verb. In an accusative language, agreement with the O in Spec TrP precedes agreement with the A in Spec IP, and thus O agreement morphology appears closer to the verb than that of the A.

Although the examples in (11) to (14) show Tr agreement linearly closer to the verb than I agreement, it is the hierarchical notion of "closer" rather than linear order that is of importance. Following Baker (1985), Marantz (1988), Noyer (1991) and Speas (1990), among others, I assume that the actual linear order in which elements are realized at PF is not a syntactic property, but is established in the mapping from syntax to PF by language-specific rules. The relevant hierarchical structure is shown in (16), where Tr agreement is structurally closer to V than I agreement.

(16) $[V\ Agr_{Tr}\ ]\ Agr_{I}$

The Agr morphemes in (16) may be linearly realized in various ways, as illustrated in (17).

(17) a. $V\text{-}Agr_{Tr}\text{-}Agr_{I}$ c. $Agr_{I}\text{-}V\text{-}Agr_{Tr}$
b. $Agr_{I}\text{-}Agr_{Tr}\text{-}V$ d. $Agr_{Tr}\text{-}V\text{-}Agr_{I}$

The Inuktitut example in (11) above has the pattern of (17a), while (12) to (14) have the pattern shown in (17b).[12]

In languages where the A and O morphemes appear on different sides of the verb, as in (17c-d), it may appear that both morphemes are equally close to the verb. Accusative languages of Papua New Guinea such as Tauya, Fore and Manam exhibit this type of agreement pattern. Shown in (18a) and (18b) are examples from Manam and Fore, respectively. In (18a) A agreement is a prefix, and O agreement is a suffix (as in (17c)). In (18b), the affixal properties of the morphemes are reversed: the A morpheme is a suffix, and the O morpheme is a prefix (see (17d)).

(12) For verbal agreement, I do not adopt Kayne's (1994) proposals that linear order directly reflects hierarchical structure, and that adjunction is always to the left. It is not clear how Kayne's proposal would accommodate the different patterns of agreement shown in (17b-d) above, which appear to be derived from similar syntactic structures, and all involve right-adjunction at some point in the derivation. It may be necessary to distinguish between linear order in syntax (e.g., word order in sentences and the placement of clitics relative to the verb) and the order of agreement morphemes on the verb, as in (17).

(18) a. tamóata bóro í-te-di
man pigs 3sA.Real-see-3pO
'the man saw the pigs'
(Lichtenberk 1983: 119)

b. a-ka-y-e
3sO-see-3sA-Ind
'he sees it'
(Scott 1978: 53)

Although from the above examples it cannot be determined whether or not the A and O affixes are hierarchically ordered, other examples in the language provide evidence that a hierarchy does exist. In both Manam and Fore, various elements may appear between the verb and A agreement marker, but not between the verb and O marker, indicating that V and O form a closer unit than V and A. In the Manam example in (19a), the classificatory prefix *ʔara* indicating that the action was performed with the teeth (from *ʔarat* 'bite') appears between the verb and A agreement. In (19b), from Fore, the aspect marker *wae* following the verb indicates totality.

(19) a. móli i-ʔara-sísiʔ-i
orange 3sA.Real-"bite"-peel-3sO
'he peeled the orange (with his teeth)'
(Lichtenberk 1983: 215)

b. a-ka-wae-y-e
3sO-see-Total-3sA-Ind
'he sees it all'
(Scott 1978: 53)

The agreement morphemes in these languages thus exhibit the same hierarchical structure as those in other accusative languages, although with different linear orderings.

In an *ergative* language where agreement appears on both sides of the verb, the hierarchical structure in (16) predicts that A agreement is closer to the verb than O agreement. An example of such a language is Tojolabal, a Mayan language. In (20a), it is difficult to determine the structure of the A and O agreement morphemes. However, elements such as voice and mood may appear between the verb and O agreement (see (20b)), while nothing may intervene between the verb and A agreement.

(20) a. 7oh h-mak'-Ø-eh
Fut.prog 1sA-hit-3sO-Terminal
'I am going to hit him' (Furbee-Losee 1976: 135)

b. Ø-s-moh-t-ay-on ha Hwan-ih
Compl-3sA-companion-Tr-Imperf-1sO Det John-Loc
'John accompanied me' (Furbee-Losee 1976: 139)

This asymmetry with agreement morphemes on both sides of the verb demonstrates that adverbial-like elements are only adjoined to projections higher than TrP, leading to the adjacency of the verb and Tr agreement. In accusative languages the verb is adjacent to the object agreement morpheme, and in ergative languages, it is adjacent to the subject agreement morpheme.

I have so far limited the examples of verbal agreement to instances where there is a direct relation between syntactic agreement positions and agreement morphemes. That is, each movement to a functional head is reflected by an agreement morpheme on the verb, and the order of morphemes reflects exactly the order of movement. There are several cases, however, where the actual mapping from the syntax to PF may deviate from this unmarked, one-to-one correspondence. The

mapping may undergo processes such as fusion, fission and merger, which alter the underlying string of morphemes. Fusion takes two heads and fuses them into a single head, fission involves the splitting off of a specific feature into a separate morpheme, and merger joins two adjacent nodes under a single node.[13]

Consider the fusion of two agreement morphemes, resulting in a single portmanteau form. Shown in (21) are examples of fused morphemes, where it is not possible to determine the underlying order of A and O agreement.

(21) *Inuktitut (Inuit)*

a. malik-p-a-ra	b. malik-p-a-tka
see-Ind-Tr-1sA.3sO	see-Ind-Tr-1sA.3pO
'I followed him/her'	'I followed them'

However, there are other examples in the language, such as (11) above, that do not involve a portmanteau morpheme. Inuit being an ergative language, in (11) A agreement appears closer to the verb than O agreement. Although there do appear to be languages in which all transitive agreement morphemes are portmanteau, e.g. Apalai (Carib; Koehn and Koehn 1986), it is more common for only part of the agreement paradigm to involve portmanteau forms.

Other apparent counterexamples to the hierarchical structure in (16) involve languages that appear to have both ergative and accusative patterns of agreement, as examples of both A and O agreement appearing closest to the verb are found. Two languages exhibiting this behaviour are Western Desert (Australian) (see (22)) and Dakota (Siouan), shown in (23). These forms are discussed in Noyer (1992) as examples of the "Placing Problem".

(22) *Western Desert*

a. pu-ŋku-rna-nta	b. pu-ŋku-rni-n
hit-Fut-1sA-2sO	hit-Fut-1sO-2sA
'I will hit you'	'you will hit me'
	(Dixon 1980: 362)

(23) *Dakota*

a. u:-ni-kte	b. u:-ya-kte	(Schwartz 1979)
1pA-2sO-kill	1pO-2sA-kill	
'we killed you'	'you killed us'	

In both (22) and (23), the agreement morpheme corresponding to first person precedes that of second person, regardless of the grammatical function associated with the morphemes. The linear order of agreement morphemes is thus determined by a person hierarchy that overrides the unmarked ordering of morphemes (see Albizu this volume for related discussion). Similar person hierarchies are found in Mangarayi (Pama-Nyungan; Merlan 1982) and Hixkaryana (Carib; Alexander 1989).

Finally, the opposite order of agreement morphemes to the expected pattern is found in the accusative Athapaskan languages, where A agreement appears closer to

(13) For a full discussion of these processes, see Bonet (1991), Halle and Marantz (1993), Marantz (1991) and Noyer (1992).

the verb than O agreement (see Kari 1989, Rice 1989, Speas 1990, 1991a, 1991b). However, it is claimed in Speas (1990, 1991a, 1991b) that the hierarchical structure of the four inflectional categories AgrO, Aspect, Tense and AgrS (see (24)) is the same as in other accusative languages, with Tense taking scope over Aspect, and object agreement closer to the verb than subject agreement:

(24) (clitics) AgrO Aspect Tense AgrS [verb stem]

Although the internal order of the inflectional affixes in Navajo reflects their scope order, the linear order with respect to the verb stem is reversed. Speas proposes various analyses for the apparent counterexample to the Mirror Principle, suggesting that the inflectional morphemes are phonological infixes (Speas 1990), that the morphemes are lowered onto the verb rather than the the verb undergoing head-to-head raising (Speas 1991a), and that inflectional morphemes can be added in the lexicon (Speas 1991b). The important issue is that regardless of the actual linear order that is phonologically realized, the syntactic facts support a structure where object agreement is lower than subject agreement.[14]

3.2. Scope of Quantifiers

In this section I discuss differences in scope found in accusative and ergative languages. In an ergative language such as Inuit, the A argument behaves like an O argument in an accusative language, taking both wide and narrow scope. Similarly, the O argument in Inuit behaves like the A argument in English or Polish, taking only wide scope. Bittner (1994) and Bittner and Hale (1996) claim that cross-linguistic variation in scope options reflects a difference in structural representation rather than a difference in semantic rules. Since scope is determined by c-command relations, arguments that take narrow scope with respect to sentential operators must be within the c-command domain of the operator, while those with only wide scope are outside its domain. In the following example from English, the O QP remains below the sentential operator at s-structure, giving the default reading of narrow scope (25i). Wide scope is also possible, since English is a language that has Quantifier Raising at LF (see (25ii)).

(25) Mary hasn't seen one friend yet (at the party).

(i) Mary hasn't seen any friends yet.
(ii) There is one particular friend that Mary hasn't seen yet.

If, on the other hand, the QP appears above the sentential operator, it can only have a wide scope reading. In (26a) the O is topicalized to a position above

(14) Of all the languages I have investigated, I have found only one that appears to be a true counterexample to (16): Seri, a language isolate with closest affiliation to the Yuman family (Marlett 1981, 1990). Seri is an accusative language whose agreement follows the pattern of ergative languages, with A agreement appearing closer to the verb than O agreement:

(i) ma-ʔ-yo-aʔo
2sO-1sA-Distal Realis-see
'I saw you' (Marlett 1990: 523)

negation, and in (26b) the QP is an A argument that raises to Spec IP.[15] In both cases only the wide scope interpretation is possible.

(26) a. One friend, Mary hasn't seen yet.
b. One friend hasn't seen Mary yet.

As illustrated in (26b), an A argument that raises above negation to Spec IP can only have wide scope in English. Bittner (1991) claims this to be true in Polish as well.

(27) wszyyscy czterej studenci nie=by-l-i na zebraniu
all-Nom four-Nom students-Nom Neg=be-Past-3p.masc on meeting

(i) *'Not all the four students were at the meeting'
(ii) 'All the four students were absent from that meeting'
(Bittner 1991: 1)

Bittner (1987, 1994) and Bittner and Hale (1996) observe that arguments in certain ergative languages exhibit scope relations different from those in accusative languages such as English and Polish. In West Greenlandic Inuit, for example, A arguments can take both wide and narrow scope with respect to sentential operators (see (28)), whereas in English and Polish they can only take wide scope (as shown in (26b) and (27) above).

(28) atuartu-p ataatsi-p Juuna uqaluqatigi-sima-nngi-la-a
student-Erg one-Erg Juuna talk.to-Perf-Neg-Ind-3s.3s

(ii) 'one student hasn't talked to Juuna (yet)' (narrow)
(i) 'no student has talked to Juuna (yet)' (wide) (Bittner 1994: 2)

O arguments, on the other hand, can only have wide scope in Inuit (see (29)), but may have both wide and narrow scope in English (see (25) above):

(29) Juuna-p atuagaq ataasiq tigu-sima-nngi-la-a
Juuna-Erg book one get-Perf-Neg-Ind-3s.3s
'there is a book which Juuna hasn't got (yet)' (Bittner 1994: 2)

With respect to scope, then, the A argument in Inuit has the same default narrow scope reading as the O argument in an accusative language such as English or Polish. The A in (28), then, must be in a lower position than the negative operator. In (29), since the O argument can only have wide scope, it must appear higher than negation. These facts support a Nested Paths analysis of NP movement in Inuit, where A raises to Spec TrP, remaining below negation, while O raises to Spec IP, a position above negation.[16]

(15) I am assuming that NegP occurs below IP, the projection to which the subject raises (see Pollock 1989).
(16) In other ergative languages such as Warlpiri and Hindi, the object remains in the VP at s-structure. Both narrow and wide scope readings are possible, although the default is narrow scope (see Bittner 1994 and Bittner and Hale 1996).

3.3. Participial Relative Clauses

A restriction on participial relative clauses has been observed in many languages, where only "subjects", i.e., S and A, may be relativized. The examples in (30) demonstrate this restriction in English: in (30a-b) S and A, respectively, are relativized, while the ungrammatical (30c) involves relativization of O.

(30) a. the child sleeping on the mat
b. the boy chasing butterflies
c. *the butterflies the boy chasing

Similar facts have been observed with German, French, Russian, Polish and Turkish participial relative clauses, and with Hebrew "semi-relatives" (Keenan and Comrie 1977, Barker, Hankamer and Moore 1990, and Siloni 1995). Shown in (31) are Siloni's (1995: 463-4) examples from French (parentheses mine). In (31a-b) S and A are relativized, while in the ungrammatical (31c) O is being relativized.

(31) a. [La fille arrivant aujourd'hui à Genève] est née à Rome
the girl arriving today in Geneva was born in Rome
b. [L'homme lisant le journal] est un espion
the man reading the newspaper is a spy
c. *[Le journal l'homme lisant] est intéressant
the newspaper the man reading is interesting

In Turkish, relativization involves the participial suffix *-En*, which is added to the verb when the noun being modified is a subject:[17]

(32) a. mekteb-e gid-en oğlan
school-Dat go-Part boy
'the boy who goes to school'
(Underhill 1972: 87)

b. kabağ-i yi-yen yılan
squash-Acc eat-Part snake
'the snake that ate the squash'
(Barker, Hankamer and Moore 1990: 22)

As in English and French, the object cannot be relativized in this manner (see (33)).[18]

(33) *dana-lar gir-en bostan
calf-Pl enter-Part garden
'the garden which calves entering' (Underhill 1972: 95)

(17) The situation is somewhat more complex, as not only subjects, but also constituents of the subject (e.g. possessor), and consitutents of the object when the subject is absent, may be modified with the subject participle. See Underhill (1972), Hankamer and Knecht (1976) and Barker, Hankamer and Moore (1990) for further details.

(18) When the modified noun is a direct object or oblique argument, a different participial affix, *-DIg*, is added to the verb:

(i) a. yılan-ın ye-diğ-i kabak
snake-Gen eat-OAff-3s squash
'the squash that the snake ate'
(Barker, Hankamer and Moore 1990: 22)

b. oğlan-ın mekteb-in-e git-tiğ-i adam
boy-Gen school-3s-Dat go-OAff-3s man
'the man whose school the boy goes to'
(Underhill 1972: 89)

Siloni (1995) analyzes participial relative clauses as DPs, with the D° head taking an AgrP complement. According to her analysis, these relative clauses involve movement of a null operator that receives null Case from the [–Tense] Agr within the DP. The Spec of [–Tense] Agr is the landing site of the relativized argument (i.e., the null operator). In accusative languages such as English and French, it is S and A that raise to this Spec position, thereby restricting relativization to these arguments. In ergative languages, on the other hand, I have claimed that S and O raise to the equivalent Spec position. Therefore, relativization in participial relative clauses in ergative languages should be restricted to S and O, and not S and A as in accusative languages. This prediction is supported by the following data from Inuit and Dyirbal.

Shown in (34) are examples of relativization in West Greenlandic Inuit. (34a) illustrates relativization of O, and (34b), that of S. In the ungrammatical (34c), the A argument is being relativized.

(34) *West Greenlandic Inuit*

a. miiqqa-t Juuna-p paari-sa-i sinip-p-u-t
child-Pl Juuna-Erg look.after-Rel[+tr]-3s.Pl sleep-Ind-Tr-3pN
'the children that Juuna is looking after are sleeping'

b. miiqqa-t sila-mi pinnguar-tu-t illar-p-u-t
child-Pl outdoors-Loc play-Rel[–tr]-Pl laugh-Ind-Intr-2pN
the children who are playing outdoors are laughing' (Bittner 1994: 55)

c. *angut aallat tigu-sima-sa-a
man gun take-Perf-Rel[+tr]-3s.s
'the man who took the gun' (Bittner 1994: 58)

This restriction on relativization in Inuit has been widely discussed in the literature (e.g., Creider 1978, Woodbury 1977, 1985, Smith 1984, Johns 1987, 1992, and Bittner 1994). The analyses of Johns (1987, 1992) and Bittner (1994) are closest in spirit to the one presented here, with modification being restricted to the highest NP in the clause after movement.

In Dyirbal, as in Inuit, only S and O may be relativized (see (35a-b), respectively).

(35) *Dyirbal*

a. bay-i yara [miyanda-ŋu] ba-ŋgu-n yibi-ŋgu bura-n
there(Nom)-m man(Nom) laugh-Rel(Nom) there-Erg-f woman-Erg see-Past
`the woman saw the man who was laughing' (Dixon 1991: 40)

b. ŋada nyina-nyu yugu-ŋga [yara-ŋgu nudi-ŋu-ra]
I(Nom) sit-Nfut tree-Loc man-Erg cut-Rel-Loc
`I am sitting on the tree the man felled' (Dixon 1972: 102)

Modifying an A argument is possible only when the verb is in the antipassive, which makes the A a derived S:

(36) bay-i yara [jilwal-ŋa-ŋu ba-gu-n guda-gu] yanu
there(Nom)-m man(Nom) kick-AP-Rel(Nom) there-Dat-f dog-Dat went
`the man who kicked the dog went' (Dixon 1991: 41)

Although the Dyirbal and Inuit relative clauses are not referred to in the literature as participial relative clauses, the consensus is that they involve a nominal construction. For example, relative clauses in Inuit have been described as involving a nominalized verb (Smith 1984), adjectival noun (Woodbury 1985), verbal noun (Johns 1987), and nominal relative (Bittner 1994).

One distinct nominal property of both Inuit and Dyirbal relative clauses is the presence of Case. The verbal element in the relative clause is marked with the same Case as that of the relative head. For example, in (35b) above the verb + relative marker *nudi-ŋu* appears with locative Case, which is the Case of the relative head *yugu* 'tree'. The same is true in Inuit, as shown in (37) where both the verb in the relative clause and the relative head have ergative Case.

(37) nukappiaqqa-p qimmi-mut kii-sit-tu-p uqaluttuar-aa
boy-Erg dog-All bite-cause-Part-Erg tell.about-Ind.3sE.3sN
'the boy bitten by the dog told about it' (Fortescue 1984: 52)

Data from Inuit seem to support Siloni's proposal that participial relatives involve operator movement. As shown in (38), there is a subjacency violation when extracting from the relative clause.

(38) *Jaani-up quki-lauq-tanga nanuq [kia taku-lauq-pauk]
John-Erg shoot-Past-3s.3s polar bear [who.Erg see-Past.3s.3s.Interrog]
'who did John shoot the polar bear that t saw'

The different restrictions on participial relative clauses in accusative and ergative languages provide further evidence for the central claim of this paper that accusative languages exhibit Crossing Paths, while ergative languages exhibit Nested Paths.

4. Shortest Movement and Nested Paths

In this section I provide a theoretical account of Nested Paths movement that applies the economy principle of Shortest Movement. The definition of Shortest Movement presented here is based on shortest distance between two points in a structure and the availability of elements for movements.

4.1. The Principle of Shortest Movement

I propose the following version of the Shortest Movement principle:

(39) *Principle of Shortest Movement*
Movement must involve the closest available target X, and the closest available element Y.

(40) a. β is *closer* than α to γ in the structure [α...β...γ] if α c-commands β, and β does not c-command α. β is *closer* than γ to α if β c-commands γ, and γ does not c-command β.

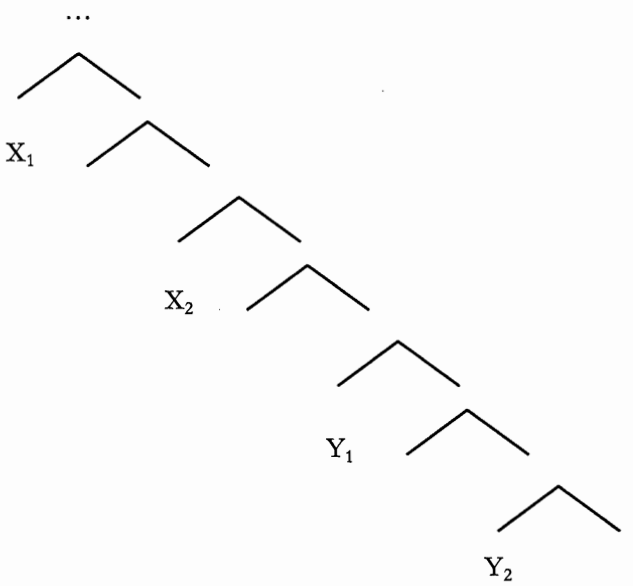
b. X is an *available target* for Y if X has not fulfilled its interpretational requirements.
c. Y is *available for movement* to X if Y has not fulfilled its interpretational requirements.

The target X, which is a position to which an element moves or adjoins, may be a head, an A-position, or an A'-position. For the distinction between A and A' positions I will use Mahajan's (1990: 10) particular definition of L and non L-related positions, respectively:[19]

(41) *L-related positions:* Specifier and complement positions of a lexical item and functional heads projected from it. Within the clausal system it includes Spec and Complement positions of V, Agr and T.
Non L-related positions: All other positions including Spec CP and adjunction positions.

In determining the element Y that moves to X, two factors are considered: distance and availability. By the Principle of Shortest Movement, Y must be the *closest* element to X, where the notion of "closest" is based on the number of c-commanding positions between X and Y. In (42), Y_1 is the closest element to the two potential targets X_1 and X_2.

(42)



Similarly, X must be the closest target to Y, based on the same definition of closeness. In (42), X_2 is the closest target to both Y_1 and Y_2. The movement that

(19) For further discussion of A and A' positions, see Diesing (1990), Saito (1992) and Webelhuth (1989).

will satisfy the "closeness" requirement of both the target and the moved element in (42) is the one where Y_1 raises to X_2.

The following example involving super-raising demonstrates the Shortest Movement principle.

(43) a. e_1 seems [e_2 is likely [John to leave]]
b. e_1 seems [John$_i$ is likely [t_i to leave]]
c. it seems [John$_i$ is likely [t_i to leave]]

As shown in (43a), there are two target positions, e_1 and e_2. The NP *John* is the closest element to both targets. However, *John* raises to e_2 and not e_1, since e_2 is the closest target to *John*.

Strict cyclicity follows naturally from this requirement that movement involve the closest available target. Raising to X_1 before X_2, which violates strict cyclicity, is a violation of Shortest Movement, as X_2 is a closer target than X_1. The effects of strict cyclicity may be defined as follows:[20]

(44) *Strict Cyclicity*
Lower targets are targetted before higher ones.

The term *targetted* is used in (44) rather than *filled*, since the actual filling of a specifier, for example, may occur anywhere in the derivation. Whether the actual movement occurs overtly or covertly does not affect cyclicity, as it is the selecting of elements for movement, rather than the actual movement to targets, that obeys strict cyclicity. For example, a (lower) Spec that is not filled until LF will still be targetted before a (higher) Spec that is filled at s-structure.

In addition to satisfying the closest distance requirement, X and Y must be *available*. The criterion for determining availability is that the element Y or target X not have fulfilled its interpretational requirements. The need to satisfy the principle of Full Interpretation (FI) is the fundamental motivation for Move-α. NP-movement, for example, occurs when an NP needs Case, a requirement on the Visibility Condition for interpretation at LF (Chomsky 1986b).[21] An NP is *available* for movement if its Case requirements have not been satisifed. Once the requirements have been met, the NP is no longer considered a potential "closer element" in determining shortest movement. In the super-raising example in (43) above, *John* cannot raise further to e_1 since, having fulfilled its Case requirements, it is no longer available for movement.

The target to which an element moves must also satisfy certain requirements for FI. The Spec of a Case-assigning functional head, for example, must be filled so that the head can assign its Case.[22] In (45a), [+tense] Infl has Case to assign. Since there

(20) I am not claiming Strict Cyclicity to be a principle, but rather a consequence of obeying Shortest Movement.

(21) Within the minimalist program of Chomsky (1993), the requirement for NPs is that their morphological features, including Case features, be checked in a Spec-head relation with a functional head.

(22) The requirement that an element with Case to assign must assign that Case is proposed in Fukui and Speas (1986) with their Saturation Principle, which states that every position in a grid (thematic or Case) is discharged. The Saturation Principle is formulated as follows:

is no NP to move to Spec IP to receive the Case, *it* is inserted to satisfy the Case-assigning properties of the Infl (see (45b)).

(45) a. e is raining b. it is raining

It-insertion must be considered a last-resort strategy that is employed after all possible movements have taken place. Otherwise, in example (43) above, *it* could be inserted in e_2 to fulfill the requirements of the target, and *John* would move to e_1, resulting in the following ungrammatical case of super-raising.

(46) *John$_i$ seems [it is likely [t_i to leave]]

Once the requirements of a target have been satisfied it is no longer an available target, and therefore does not count as a potential landing site in determining the shortest possible moves.[23]

A'-movement is also motivated by the requirements of FI. The scope of a *wh*-element, for example, is determined by moving the element to Spec CP. Similarly, quantifiers must raise to an IP-adjoined position at LF to receive their scope (May 1985). Such elements are available for A'-movement if they have not yet received their scopal interpretations.

The targets of A'-movement must also satisfy certain requirements. For example, *wh*-movement to Spec CP for scopal reasons is motivated in part by the [+wh] feature in C, which requires a *wh*-element in its Spec (see Lasnik and Saito 1984, Rizzi 1990b, Epstein 1992, Watanabe 1993 and Zwart 1993, among others, for discussion).[24]

Head-to-head movement provides another instance of movement motivated by the requirements of the moved element as well as those of the target. Verb raising, for example, is required not only for agreement between a verb and the NP in a functional Spec position, but also by the requirements of functional affixes that require a morpheme to attach to.[25]

The definition of Shortest Movement provided in (39) does not consider the notion of appropriateness (cf. Jonas and Bobaljik 1993), that is, the matching of

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(i) *The Saturation Principle*
(a) Every grid position is discharged.
(b) If X discharges a grid position in Y, then it discharges only one.

(23) Fulfilling the requirements of the target or moved element is not enough, however, to motivate all instances of NP movement. Consider the following examples, which all involve a [–tense] I:

(i) a. I believe [$_{IP}$ John$_i$ to [$_{VP}$ t_i have left]] c. Jill wants [$_{IP}$ PRO$_i$ to [$_{VP}$ be informed t_i]]
b. for [$_{IP}$ Mary$_i$ to [$_{VP}$ t_i stay]] would be desirable

In the examples in (i), movement to the Spec of [–tense] I is not motivated by the Case requirements of I, as I has no Case to assign. Nor does movement occur to fulfill the Case requirements of the moved NPs, which do not receive Case in that position. Such examples demonstrate the need for some version of the Extended Projection Principle.

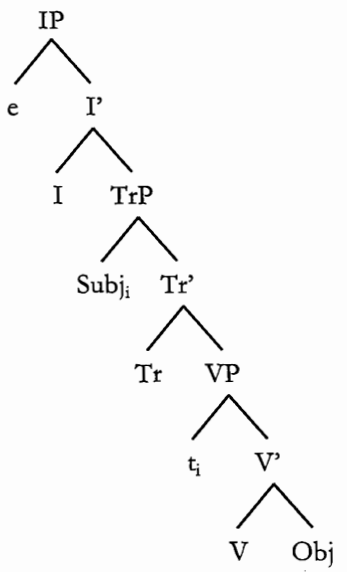
(24) However, A'-movement involving adjunction and not substitution, e.g. Quantifier Raising (May 1985) and Topicalization (Baltin 1982, Lasnik and Saito 1992, Watanabe 1993), appear to be motivated strictly by the requirements of the moved element, and not by any conditions on the target site.

(25) The dual requirement of the target (or its head) and the moved element is captured by Chomsky's (1993) system of feature *matching*, where the features of the head must match those of the moved element in its Spec.

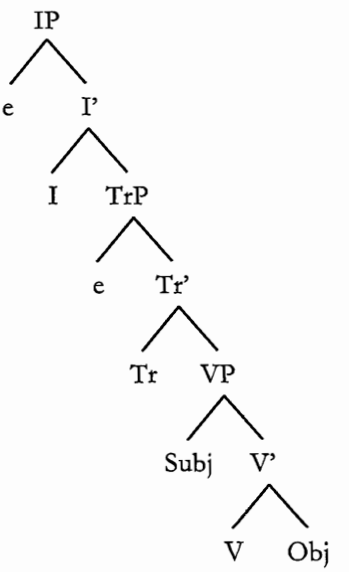
moved elements and targets in terms of type (head, A or A'). It is not necessary to include type matching in the economy principle of Shortest Movement, as it will be subsumed under general restrictions on movement, most notably the notion of "structure preservation" proposed by Emonds (1976), and formulated in various ways by Baltin (1982) and Chomsky (1986a).

I claimed above that any element that has fulfilled its interpretational requirements, and thus is not available for movement or as a target, is no longer visible for calculating shortest movement. This entails that "satisfied" elements (e.g., filled specifiers) have a different status from "unsatisfied" ones (e.g. unfilled specifiers), in that the former count in determining shortest movement, whereas the latter do not. According to the interpretation presented here, Shortest Movement is not a fixed principle that permits only specific movements, such as crossing over one Spec position but not two (as in Chomsky 1993). Rather, the notion of Shortest Movement differs from structure to structure, depending on the targets available for substitution (or adjunction) and elements available for movement. Consider, for example, the two structures shown in (47). In (47a), movement of the object to Spec IP would be permitted even though it involves crossing two Spec positions, since Spec IP is the closest available target, and the object is the closest available NP. In (47b), however, the same movement is prohibited, as Spec TrP is the closest available target, and the subject is the closest available NP.

(47) a.



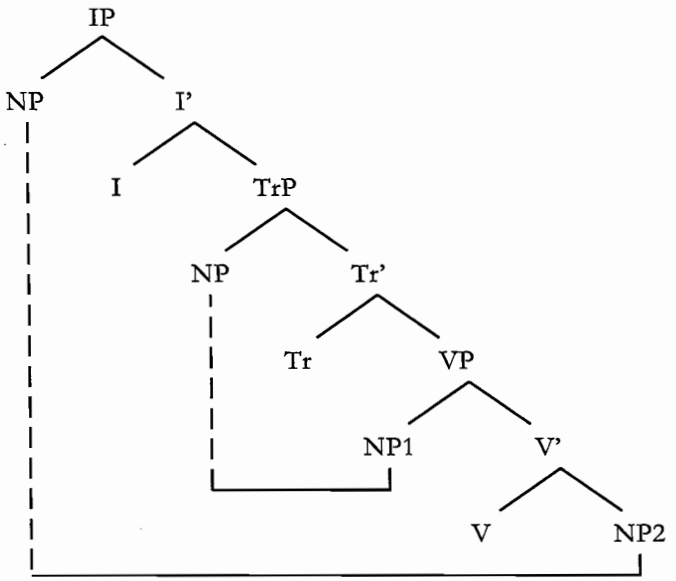
b.



4.2. Shortest Movement and Nested Paths

Given the principle of Shortest Movement presented above, the resulting path of subject and object NPs in a transitive clause is Nested Paths (see (48)). The subject raises to the lower projection, TrP, while the object raises to the higher IP.

(48) *Nested Paths*



Let us consider the derivation of the Nested Paths structure in (48). The Spec of TrP is targetted first in the assignment of Case. The closest available NP to move into this position is the subject, NP1, which receives structural Case from Tr. Next, an NP is required to move into Spec IP. There is only one NP remaining, the object NP2, that is available for movement to this position. The subject in Spec TrP is actually closer in terms of actual distance, as it will not cross any Spec positions to reach Spec IP, whereas the object must cross two, Spec VP and Spec TrP. However, the subject is no longer available for movement, as it receives structural Case in Spec TrP.

In the following section I discuss how Crossing Paths in accusative languages is possible given the basic Nested Paths movement determined by the Shortest Movement principle. I propose that in accusative languages the Principle of Shortest Movement is overridden by two factors: (1) the assignment of Case to the object by the verb, and (2) a condition on Case assignment that restricts verb assignment to elements in Spec TrP.

5. Crossing Paths in Accusative Languages

There is a class of theories on ergativity which, in accordance with the investigation presented here, recognize that the transitive object appears in a higher syntactic position in ergative languages than in accusative languages. Such theories include those of Mahajan (1990), Bok-Bennema (1991), Campana (1992), Murasugi (1992), Bittner and Hale (1996), Bittner (1994) and O'Herin (1995). With the exception of Murasugi (1992) and O'Herin (1995), these theories propose that verbs in ergative languages do not assign Case, forcing the object to raise to a VP-external

Case position. In accusative languages, on the other hand, verbs may assign Case to their objects, permitting the object to remain in the VP.

In the present framework, the subject and object in both types of languages raise to a Case position outside the VP (i.e., Spec IP or Spec TrP). The difference in the position of the object in the two language types results from the different movement paths created by the NP arguments. Following previous theories, I attribute the difference between ergative and accusative languages to the Case-assigning property of the verb: in ergative languages, unlike in accusative languages, verbs do not assign Case. The head of TrP thus acts independently of the verb in assigning Case; that is, it can assign Case without the verb. In an accusative language, on the other hand, the verb is responsible for Case to the object. TrP simply provides a structural position for Case assignment, as structural Case is assigned in a Spec-head configuration (following Chomsky 1991). Since it is to the Spec TrP position that Case is assigned, this is the position to which the object must move, creating Crossing Paths.

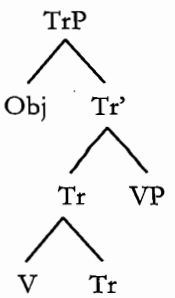
One may ask why it is Spec TrP rather than Spec IP that provides the Case-assigning position. I propose that the Condition on Spec-Head Case Assignment given in (49) below prevents the verb from assigning Case to the object in Spec IP, creating Nested Paths in an accusative language. According to the condition, a head can assign Case to an NP that is either in its Spec, or in the next highest Spec position when it adjoins to the higher head. This condition is reminiscent of Travis' (1984) Head Movement Constraint and Rizzi's (1990a) Relativized Minimality in that X° can assign Case to an NP in Spec YP only if there is no other head intervening between X° and Y°. A verb, then, can assign Case to the NP in Spec TrP, which is the next highest Spec position, but not to Spec IP, which is two Specs away.

(49) *Condition on Spec-Head Case Assignment*
For an X° to assign Case to an NP in a Spec-head configuration, the NP must be in:

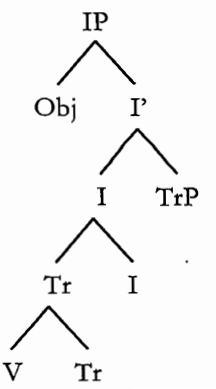
a. Spec XP, or
b. Spec YP, where X is immediately dominated by Y after adjunction.

Consider the structures in (50a-b), with the object in Spec TrP and Spec IP, respectively.

(50) a.



b.



In (50a) V is immediately dominated by Tr, and is therefore in the proper configuration for Case assignment to Spec TrP. In (50b), however, I does not immediately dominate V. V is thus too deeply embedded in the adjunction structure to assign its Case to the object in Spec IP.[26]

The crucial consequence of the condition in (49) is that the verb, which assigns Case to its object, can assign this Case only when the object is in Spec TrP. In accusative languages, then, where transitive verbs assign Case to their objects, the object must raise only to Spec TrP if it is to receive the verb's Case. This movement results in Crossing Paths, as the subject raises to Spec IP in order to receive Case from I.

The difference in NP movement in the two types of languages may be formalized as follows:

(51) *Ergative Parameter*
Verbs in accusative languages assign Case to their object, forcing the object to raise to Spec TrP. Verbs in ergative languages do not assign Case, permitting the object to raise to Spec IP.

In accusative languages, the assignment of Case by the verb forces the object to raise to Spec TrP in order not to violate the Condition on Spec-Head Case Assignment presented in (49) above. In ergative languages, on the other hand, the condition does not apply to the verb, since the verb does not assign Case. With the subject and object thus equally available for movement, Shortest Movement determines that the subject raises to Spec TrP, and the object to Spec IP.

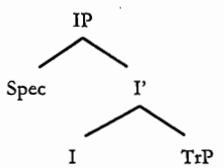
6. A'-Movement in Accusative Languages

In sections 4 and 5 above it was shown that the Principle of Shortest Movement creates Nested Paths, which is found in ergative languages. The Crossing Paths movement found in accusative languages was accounted for in section 5 by a condition on Case assignment that forced the object to raise to Spec TrP. In this section I discuss a particular case of A'-movement in accusative languages, Superiority. Since A'-movement involves NPs that already have Case, the condition on Case assignment proposed above should not apply. Shortest Movement would therefore predict Nested Paths, even in accusative languages. Superiority is a case of A'-movement that follows this prediction.

Superiority effects, first observed by Chomsky (1973), involves examples such as the following:

(26) Condition (49) is met in the following structure, where I assigns nominative Case directly to the NP in its Spec:

(i)



(52) a. who$_i$ did you persuade e$_i$ to read what?
b. ??what$_j$ did you persuade who(m) to read e$_j$?

(53) a. Mary asked [who$_i$ [e$_i$ read what]]?
b. *Mary asked [what$_j$ [who read e$_j$]]?

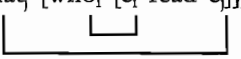
In the (a) examples the subject *wh*-phrase is in Comp at s-structure, while the object *wh*-phrase remains *in situ*. In contrast, as shown in the (b) examples, the raising of the object *wh*-phrase at s-structure, with the subject remaining *in situ*, results in ungrammaticality.

Pesetsky (1982, 1987) proposes an account of superiority effects based on nested dependencies, i.e., the dependency paths between two *wh*-phrases and their traces.[27] The formal definition from Pesetsky (1987: 105) is given in (54).

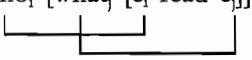
(54) *Nested Dependency Condition*
If two *wh*-trace dependencies overlap, one must contain the other.

The sentences in (52) and (53) involve two *wh*-trace dependencies. The first one is created at s-structure, when one of the *wh*-phrases raises to Comp. The second one is created at LF when, according to Pesetsky, the other *wh*-phrase raises and adjoins to S'. In the grammatical (a) examples, the two dependency paths are nested, while in the ungrammatical (b) examples, they cross (see (55)).

(55) a. Mary asked [what$_j$ [who$_i$ [e$_i$ read e$_j$]]]?



b. *Mary asked [who$_i$ [what$_j$ [e$_i$ read e$_j$]]]?



A similar constraint on movement is found with examples such as (56), which involve two instances of *wh*-movement at s-structure.[28]

(56) a. what subject$_i$ do you know [who$_j$ [PRO to talk to t$_j$ about t$_i$]]
b. *who$_j$ do you know [what subject$_i$ [PRO to talk to t$_j$ about t$_i$]]

When the dependency paths cross, as in (56b), the sentence is ungrammatical. In the grammatical (56a), the paths are nested.

Pesetsky (1982: 269) observes that the same effects are found with other instances of A'-movement, such as topicalization:

(57) a. this problem$_j$, Mary knows [who$_i$ [PRO to consult t$_i$ [about t$_j$]]]
b. *this specialist$_i$, Mary knows [what problems$_j$ [PRO to consult t$_i$ [about t$_j$]]]

Pesetsky's proposal of nested path dependencies receives a natural account in the economy framework presented here. Consider the examples in (55) above. Since

(27) For other analyses of Superiority effects, see Chomsky (1973), Hendrick and Rochemont (1982), Lasnik and Saito (1992), and Cheng and Demirdache (1990).

(28) This was first observed by Kuno and Robinson (1972).

there is no Case condition relevant to A'-movement, both *who* and *what* are equally available for movement to Spec CP.[29] In (55a), the closest *wh*-phrase, *who*, raises first. The remaining *wh*-phrase, *what*, left-adjoins to the *who* in Spec CP.[30] Raising *what* first, as in (55b), violates Shortest Movement, since *what* is not the closer element to Spec CP.

7. Conclusion

This paper proposes a definition of the Shortest Movement principle based on the shortest distance between two points in a structure and the availability of elements for movement. It interprets Chomsky's (1993) shortest move principle in the purest way, without recourse to the notion of equidistance, which is a strategy used to solve apparent violations of shortest move. The system proposed here accounts for ergative languages in a straightforward manner, recognizing Nested Paths as the basic path of NP movement, in contrast to most recent theories of Case and NP movement that assume Crossing Paths to be universal.

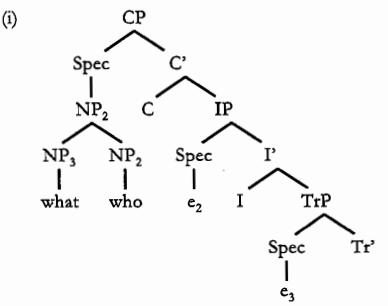
The Crossing Paths movement found in accusative languages results from the assignment of Case to the object by the verb, and the proposed Condition on Spec-head Case assignment that restricts verbal Case assignment to NPs in Spec TrP. The object has no option but to raise to Spec TrP, leaving only the subject to raise to the other Spec position. In such cases where there is no choice of NPs available for movement, Shortest Movement does not apply. The existence of Crossing Paths demonstrates that Shortest Movement operates to select the most economical derivation only in cases where a choice of derivations is available.

Economy principles (of derivation) thus differ from conditions and constraints in that their application depends on their environment. Consider another economy principle discussed in Chomsky (1993), Procrastinate. According to this principle, operations should be performed as late as possible, preferably at LF. Chomsky claims that LF operations are a kind mechanical "wired-in" reflex, and thus are less

(29) I follow Chomsky (1986a) in assuming that *wh*-phrases raise to Spec CP, and not to Comp.

(30) The issue of linearity, i.e., whether *what* is left- or right-adjoined to *who*, becomes irrelevant if we consider paths to be hierarchical as well as linear, as proposed by Pesetsky (1982). Pesetsky defines a path as consisting of a set of immediately dominating nodes rather than simply the two endpoints. In (i), the two paths are {IP,CP} and {TrP,IP,CP,NP_2}. The Nested Dependency condition is not violated, since the first path is contained within the second.

(i)



costly than overt operations. Like Shortest Movement, the application of Procrastinate varies depending on the particular derivation. In French, the properties of Agr force overt verb raising, so that there is no choice as to whether the verb raises early or late in the derivation. In English, on the other hand, where overt verb raising is not forced, Procrastinate ensures that the verb raises at LF rather than at s-structure.

Unlike conditions and constraints on derivations, the role of economy principles such as Shortest Movement is not to dictate what constitutes a legitimate derivation, but to facilitate the efficiency of the computational system in generating grammatical linguistic expressions.

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