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The directionality of agreement

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1. **Introduction.** Our understanding of the mechanism of agreement has increased markedly in the last few years, but one question remains which seems not to have been explicitly addressed so far. That question is whether there is any universal, inherent directionality to agreement rules. By 'directionality' I mean not left-to-right or right-to-left progression through surface strings, but rather what can be described as higher-to-lower or lower-to-higher movement in relational hierarchies and syntactic trees.

Higher-to-lower agreement in a relational hierarchy occurs when the controller of agreement is a higher-ranked relation than the target. An example of such agreement is (1).¹

(1) He-NOM was driving drunk-NOM

Here agreement in case is controlled by the subject, and the target is the lower-ranked predicate adjective.

Lower-to-higher agreement in a syntactic tree occurs when the head of a constituent agrees with a non-head member of the constituent; higher-to-lower agreement occurs when a non-head agrees with a head. (2) is a typical example of higher-to-lower agreement, where the modifying adjective agrees with the head noun in gender, number, and case.

(2) green-NOMsgFEM house(FEM)-NOMsg

Describing the head as 'higher' than the non-head is consistent with the connotations of the word head; it has a more graphic basis in the dependency representation of grammatical relations, where heads are placed above their dependents (for examples see Tesnière 1966, Mel'čuk 1979).² Henceforth I will speak of higher-to-lower agreement as downwards agreement and lower-to-higher agreement as upwards agreement. This usage is fairly metaphorical, relying as it does on graphic traditions in the representation of trees and hierarchies and on the image of agreement as copying a category from one word onto another. It is also generalizing, as it equates (paradigmatic) relational hierarchies with (syntagmatic) tree structures. Against these faults, it has the advantage of emphasizing that the abstract question of directionality is one and the same issue, wherever it may arise.

The literature gives the impression that agreement ideally, even necessarily, goes in a single direction: from higher in a tree or hierarchy to lower, i.e. downwards. Explicit statements about the directionality of agreement are hard to find, primarily because the literature on agreement has been most concerned with

other questions -- for instance, the implications of agreement for constituent analysis, syntactic distance, resolution rules, and contexts of agreement failure. (Some representative recent contributions are: Aissen 1985, Borsley 1983, Bresnan 1982, Chomsky 1981:48ff., Corbett 1983a, 1983b, Marantz 1984:72-3, Pullum & Zwicky 1984, Sawaie 1984, Stucky 1983.)

I will use agreement to mean coincidence in grammatical categories, features, or feature values on two different words in a sentence, where one word has the category or feature for a principled reason and the other merely acquires it from the first. There are two kinds of principled reasons for the appearance of the category or feature on the first word. First, it can be lexically present, either inherently (for instance, gender in Russian, German, or French nouns) or due to the speaker's choice (number in nouns). Second, it can be syntactically determined, as when cases are assigned to nouns on the basis of government and their syntactic functions. This is a traditional view of agreement, and it seems to be consistent with the spirit of most ongoing theoretical work (see e.g. Anderson 1982:574-5, Bresnan 1982:310).

The coincidence of categories or features on the two words is crucial to the definition of agreement. The same feature or category must be present on both words. The definition of agreement is not met if the morphology of one word merely reflects the influence of another rather than sharing features with it. There are several types of morphological influence which do not meet the criteria for agreement. One is government, where a governing word dictates a category or feature for another, as when a Russian verb governs the accusative or dative or instrumental or other case on its object.³ The governing word imposes the case but does not bear it: Russian transitive verbs, for instance, are not themselves in the accusative case.

Another type of non-agreeing morphological influence is found when one word points to the presence in the sentence of another word without sharing its features. For instance, some Iranian languages have a construction called izafet or ezafe, shown in (3):

- (3) Persian ketāb-e man
 book PTC my
 'my book' (Abaev et al. 1982:111)

The particle -e reflects the presence of a modifier to 'book', but neither indicates nor shares its categorial features.

A third type of non-agreeing morphological influence is found in a number of languages that display obligatory passivization or the like depending on the person or animacy configuration of the subject and object (for a recent contribution see Whistler 1985). Typically, the verb changes form when the patient outranks the agent in animacy. This is not agreement because the verb does not share animacy features with the nouns. (In fact, usually the nouns do not bear inherent lexical animacy categories at all; rather, their referents are simply ranked, on a sentence-by-sentence basis,

for relative position along a continuum. If a verb is active when man bites dog, passive when dog bites man, and active again when dog bites stick, then it is obviously not sharing some feature with a particular argument slot, but is simply responding to the relative ranking of the two arguments.)

A fourth type of non-agreeing morphological influence is sequence-of-tense rules, where (e.g. in English) a past-tense main verb causes a subordinate verb with past or future reference relative to the main verb to shift to the pluperfect or conditional respectively. This is not agreement because the main and subordinate verb do not share the same tense category.

Government and agreement, then, are not the same thing. But it is clear that they have something in common: both involve one word influencing the morphology of another. Furthermore, there are various respects in which they are, or appear to be, in complementary distribution. Thus Marantz 1984:72 equates them in an argument implicitly relying on their complementarity. My reason for not equating them is that the notion of one word influencing the morphology of another -- which is what they have in common, or what forms the frame of reference for the complementarity -- is a loose informal characterization, appropriate for introductions, topic sentences, and similar expository devices, but it is not a grammatical notion. Government and agreement, in contrast, are grammatical notions; and those grammatical notions are different things.

Despite the lack of explicit discussion on the question, the literature gives the impression that agreement is assumed to properly go downwards. One source of this impression is the fact that, for control of case agreement, the examples discussed in print do in fact illustrate downwards agreement. Another is that, for subject-verb agreement (which clearly goes upwards, from non-head to head of the clause), there is a distinct tendency to treat it as something other than agreement. The clearest example is Chomsky 1981:48ff., where subject-verb agreement is described as government of the subject's nominative case by the element INFL (the verbal inflection comprising tense and person-number). In treating agreement as government, this analysis in effect claims that it goes downward. The related account of Marantz 1984:72-3 claims complementarity between agreement and government, in that agreement goes upward while government goes downwards (these are not his terms), and thus maintains that both could be described as a single process along the lines proposed by Chomsky. In Marantz's approach, explicit recognition of upwards agreement is bought at the price of obliterating the government-agreement distinction; in Chomsky's, the upward character of agreement seems not to be recognized at all.

A different lumping of government and agreement comes from the American structuralist tradition. To describe languages with multiple verb-argument agreement, Boas (1911) used 'apposition' and Bloomfield (1962) used 'cross-reference', now the standard term. The reasons for this terminology have to do with the nature of government, not the nature of agreement: in the languages Boas and

Bloomfield were most concerned with, those using multiple agreement and no case marking, any NP's in the sentence are not governed by the verb but are rather in apposition to the gender-number-person markers on the verb. This terminological distinction, with its own consequent confusion of government and agreement, has had the effect of labeling many instances of conspicuous upwards agreement as something other than agreement.

The following sections discuss three major issues in the directionality of agreement: agreement between head and non-head in a constituent (section 2); agreement between two non-heads in a constituent (section 3); and the ranking of controllers, i.e. hierarchical principles determining the choice of controllers for agreement involving heads (section 4). The question of the directionality of agreement will be posed separately for each of these issues and for several constituent types.

2. Agreement involving heads is attested in many constituent types. In clauses it is represented by verb-argument agreement. An example of three-place verb-argument agreement is the Abkhaz sentence (4), where the verb agrees with the subject, direct object, and indirect object, with prefixes showing the person, number, and (for third person) gender of each:

- (4) Abkhaz a- xàc'a a-ph^oəs a-š^oq^o'ə Ø- lə - y - te - yt'
 ART man ART woman ART book it to-her he gave TNS
 'The man gave the woman the book' (Hewitt 1979:36)

It is an apparent universal that, for finite verbs, verb-argument agreement goes only upwards; I know of no instances where arguments copy features from their finite verbs. For nonfinite verbs, however, we have a crucial minimal pair among Indo-European absolute constructions. The absolute construction is a participial clause carrying various circumstantial meanings (saliently, time and reason). The subject of the absolute clause and the participle are in the same case.⁴ Examples (5) and (6) show Latin and Old Russian absolutes. In (5) the subject rēbus and the participle comparātis are in the ablative case. In (6) the subject Ondrěju and the participle učaščju, and the second participle prišedšju and its subject emu, are in the dative case.

- (5) Latin omnibus rēbus comparātis diem dicunt
 all-ABL things-ABL prepared-ABL day they-say
 'When everything is ready, they set a day' (BG I.vi.4)

- (6) Old Russian Ondrěju učaščju v Sinopii i prišedšju
 A.-DAT teaching-DAT in S. & having-come-DAT

emu v Korsuně, uvědě, jako is Korsunja bliz ustě
 him-DAT in K. learned that from K. near mouth

Dněpr̄skoe ...
 of Dniepr

'While Andrej was teaching in Sinopa, (and) when he came to Kherson he found out that the mouth of the Dniepr was not far from Kherson.' (PVL; PSRL I.7-8)

The absolute construction poses problems for comparative Indo-European syntax because the cases used in it differ from language to language. As is generally pointed out, the Latin ablative has various adverbial functions and its use in the absolute construction is consistent with the adverbial function of that construction. This amounts to a claim that the ablative is assigned to the participle, which is the head of the absolute clause, by the regular rules of the language. Then the ablative case on the subject must be due to agreement, and that agreement must be downwards, since it goes from (head) verb to (non-head) subject. In the Slavic languages, in contrast, the dative has no adverbial functions; it marks only possessors (in older Slavic), objects, subjects of nonfinites, and occasionally goals. It is the subject-of-nonfinite construction that is relevant to the dative absolute. (7) shows a modern Russian subject-of-nonfinite construction, the now-obsolescent dative subject of infinitive.

(7) Russian byt' bede
to-be misfortune-DAT
'There's bound to be misfortune'

(7) is a complete sentence, with all the pragmatics of assertion. The infinitive is a predicate, and its subject is the dative bede. The use of the dative in old Slavic absolute constructions is motivated by its function as subject of nonfinite: since the participial predicate of the absolute clause is nonfinite, its subject appears in the dative. To use this analysis, we must assume that the dative is assigned to the absolute-clause subject, then copied onto the participle by agreement. Such agreement goes upwards, from subject to verb. Comparison of the Latin and Slavic absolute constructions, then, gives us a minimal pair showing that agreement can go in either direction in this kind of clause.

Agreement within NP's is common, with attributive adjectives in many languages displaying agreement in gender, number, and case. Such agreement is downwards, since the dependent modifier agrees with the head. (8) shows examples from Russian, where the various forms of 'green' take their gender, number, and case from the head nouns.

(8) a. zelen-yj dom
green-NOMsgMasc house(Masc)-NOMsg 'green house'

b. zelen-uju masinu
green-ACCsgFem car(Fem)-ACCsg 'green car'

c. zelenomu ozeru
green-DATsgNeut lake(Neut)-DATsg '(to a) green lake'

In similar fashion, the Bantu languages of Africa copy gender classes from head noun to all modifiers in the NP. Chechen and Ingush, languages of the north central Caucasus, have limited downwards agreement in gender in the few adjectives that can take gender prefixation. (9) shows the adjective *-oqqa* 'big', which agrees (J, V, and D identify the gender classes marked by those consonants), and *dika* 'good', which does not.

(9) Ingush	v-oqqa	vaša		
	V	big	brother (V)	'older brother'
	j-oqqa	jiša		
	J		sister (J)	'older sister'
	d-oqqa	urs		
	D		knife (D)	'big knife'
	dika	vaša		'good brother'
	dika	jiša		'good sister'
	dika	urs		'good knife'

(9) shows that, in Chechen-Ingush, whether agreement occurs or not depends on which words are chosen.

Upwards agreement in NP's with adjective modifiers is presumably impossible, since adjectives have no inherent features that nouns could agree with. But in NP's with noun modifiers, Chechen-Ingush provides a minimal pair to (9), showing that upwards agreement is also possible in NP's (examples from Maciev 1961:169):

(10) Chechen	t'ergan	j-ühig		
	rope(J)-GEN	J-tip		'end of rope'
	lergan	d-ühig		
	ear(D)-GEN	D-tip		'earlobe'
	kuogan	b-ühig		
	leg/foot(B)-GEN	B-tip		'toe(s)'

The word meaning 'end, point, tip' is one of very few nouns which happen to be able to vary their initial consonant. In (10), the gender prefix of the head noun agrees with the gender class of the modifying noun. This pattern is unusual, since it is rare for nouns to be able to change gender. But it is a crucial example, since it shows that in principle NP's can have upwards agreement, provided the right morphological conditions happen to be met. Comparison of (9) and (10) shows that agreement in NP's can go in either direction, and that its directionality is limited only by the chance collocation of words in the NP and the array of inflectional categories in the given language.

PP's also exhibit agreement in many languages, with the

adposition agreeing in person, number, and/or gender with its object. Examples are in (11).

- (11) a Navajo tsin bi-yaadi
 tree 3 under
 'under a tree' (Young & Morgan 1980:258)
- b Abkhaz a - jəyas a - q'nə
 Art river 3sg at
 'at the river' (Hewitt 1979:103)
- c Tzutujil ruu-majk jar aachi
 3sg because-of the man
 'by/because of the man' (Dayley 1981:216)

The Navajo postposition agrees with its object in person, and the Abkhaz postposition and Tzutujil preposition agree with their objects in person and number. Since adpositions are the heads of PP's, these examples all involve upwards agreement. There are no examples of downwards agreement in PP's, probably because adpositions do not bear inherent lexical categories such as gender, number, and person that their objects could pick up.

A phenomenon that may be relevant to agreement is case attraction between head noun and relative pronoun in classical Greek. In attraction, the head or relative pronoun acquires its case from the relative pronoun or head, respectively, rather than acquiring it through the regular marking of syntactic relations. (12)-(13) show that attraction could go in both directions.

- (12) Greek prò tōn kakōn hōn oīda
 Prep Art-GENpl evil-GENpl which-GENpl I-know
 'instead of the evils which I know'

- (13) Greek 'elegon hōti Lakedaimónioi hōn
 they-said that Lacedaemonians what-GENpl

déontai pántōn peprāgotes eīen
 they-ask all-GENpl having-achieved were

'They said the Lacedaemonians had achieved all that they asked for'

In (12), the relative pronoun hōn is in the genitive plural by agreement with kakōn, not due to government by its verb oīda: oīda takes the accusative, not the genitive. In (13), the antecedent pántōn 'everything' is in the genitive due to agreement with the relative pronoun hōn (which is governed by a verb requiring the genitive); the genitive is not assigned by the verb prāssō 'achieve', which governs the accusative. Thus attraction is bi-directional in principle; the direction actually used in a particular sentence depended on the array of cases in the construction: an

accusative was highly likely to acquire the case of the other word (Smyth 1920:567ff., the source of the above examples), regardless of whether it was antecedent or relative pronoun.

In summary, examples (4)-(13) show that agreement can go in either direction in most constituents, and goes only upwards in PP's and between finite verbs and their arguments. Where it can go in either direction, its actual realization is determined by the array of words in the constituent and inflectional categories in the language. The exclusively upwards direction in PP's and finite clauses could as well be due to the array of lexical categories available to adpositions and verbs as to some inherent restriction on the agreement rule. It is therefore safe to assume that agreement is in principle bidirectional, limited only by the inflectional categories available to the various parts of speech.

3. Agreement not involving heads, i.e. between two non-heads in a constituent, appears to regularly go downwards, with higher-ranked syntactic relations controlling it and lower-ranked ones acquiring their categories. A well-studied example is agreement of predicate nominals with their controllers; the controller is a governed relation, the predicate nominal either ungoverned or a lower-ranked governed relation.

(14) Russian Ona lučše rabotaet golodnaja
 she-NsgFem best works hungry-NsgFem
 'She works best (when she's) hungry'

(15) Icelandic Við kusum Höskuld skipstjóra
 we chose H.-Acc captain-Acc
 'We chose Höskuldur captain' (Andrews 1982:450)

The controllers, ona in (14) and Höskuld in (15), are respectively subject and object. The agreeing predicate adjective of (14) is a temporal adverbial, hence not governed by the verb; that of (15) is an object, but a kind of object ranked below the direct-object controller.

Russian predicate nominals provide especially strong evidence for downwards agreement.⁵ Those that agree can be controlled only by governed nominals and some subcategorized ones, e.g. locations as in (16) and prepositional 'subjects' of possessives as in (17):

(16) Russian v Moskve daže opustevšej interesno žit'
 in M.-Loc even deserted-Loc interesting to-live
 'It's interesting to live in Moscow even (when it's) deserted'

(17) u menja ešče molodogo byla interesnaja žizn'
 Prep me-Gen still young-Gen was interesting life
 'I had an interesting life (back when I was still) young'

The main-clause subject is 'he', of the \bar{V} (masculine) class as shown by the agreement in 'lived'. The equi-deleted zero subject of the subordinate clause must therefore also be of the \bar{V} class. In (21a), the gender class of the zero subject triggers agreement in the subordinate verb 'being'. But in (21b), where the subordinate predicate nominal is a noun which carries its own gender class ('child', \bar{D} class), the subordinate verb agrees with the predicate nominal. The two sentences are identical in structure; the only difference is that (21b) has a predicate noun, which carries lexical gender. They therefore prove that agreement can be either with the subject, as in (21a), or with the predicate noun, as in (21b).

In sentences like (20) and (21), the predicate nominal is an object of some kind governed by 'be'. Therefore these examples represent object-controlled agreement. They support the relational hierarchy in showing that object controllers are possible only under certain conditions. They support the morphological hierarchy in showing that the nominative case is an important facilitating condition for object agreement. (It should be noted, however, that in both (20) and (21) the syntactic relations of the subject and predicate nominal are not as clearcut as this discussion suggests. For Russian the decision as to what is subject and what is predicate in examples like (20) is not based on strictly syntactic criteria: see Nichols 1981:188, 49ff., Padučeva & Uspenskij 1979. In Chechen and Ingush the copula 'be' might be better analyzed as a clitic on the predicate nominal than as an independent verb governing the predicate nominal.)

5. **Conclusions.** (22) summarizes the directions of agreement of various types and at various levels.

(22) Directions of agreement

	Upwards	Downwards
Agreement involving heads:		
Clause:	Verb-argument agreement Slavic dative absolute	Latin ablative absolute
NP:	Chechen noun agreement	Ingush adjective agreement
PP:	Adpositional agreement	
Agreement between non-heads:		Russian predicate nominals Avar adverbs
Ranking of controllers		Relational hierarchy Morphological hierarchy Animacy hierarchy

The following conclusions can be drawn: (1) Agreement involving heads can go in either direction, sometimes within a single language or language family. (2) Constraints and language-specific choices on its directionality appear to be based on parts of speech and their language-specific properties, not on syntactic structure. (3) The array of categories and parts of speech, cross-linguistically, is such that in PP's and finite clauses, upwards agreement is the only possibility; while there is no constituent type in which agreement involving heads is necessarily downwards. (4) In contrast, agreement between non-heads can go only downwards. (5) The difference between agreement involving heads and that between non-heads is not based on parts of speech and language-specific categories, as is shown by Avar, Chechen-Ingush, other languages of the North Caucasus, and the Bantu languages, which use morphologically identical gender-class agreement for both types. (6) Ranking of controllers for agreement involving heads is exclusively downwards.

Why should there be this asymmetry between agreement involving heads and the other two kinds? Apparently it is because agreement between non-heads and the ranking of controllers both involve comparison and ranking of nominal relations. Not surprisingly, they follow the same downward principle attested elsewhere for control and accessibility hierarchies. But agreement involving heads entails no such comparison and ranking, and does not follow the downward principle. It is inherently bidirectional.

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Footnotes

1 Abbreviations used in examples are the following: Cases: NOMinative, GENitive, etc.; numbers: sg = singular, pl = plural; genders: MASCuline, FEMinine, NEUTer, and others explained at ex. (9); others: TNS = tense, PTC = particle, ART = article. In long examples, boldfacing is used on the words showing agreement. Terminology used in this paper is traditional wherever possible.

2 Grammmarians of various theoretical persuasions are in almost unanimous accord as to what is the head of any given constituent: for the constituents to be discussed in this paper, the verb is head of the clause, the noun is head of a noun phrase, and the adposition is head of an adpositional phrase.

3 This pertains to morphological government only. The traditional understanding of government lumps morphological government with syntactic government -- the strict subcategorization of Chomsky 1965 -- where the governing word imposes not a morphological case but a syntactic relation on the governed word. All morphologically governed relations are syntactically governed; the converse is not true. In this paper government will be used of morphologically governed nominals only.

4 The absolute construction ordinarily has a subject different from that of the main clause. When the two subjects are the same, the nominative case is used on the 'absolute' clause, which is usually called a conjunct participial clause.

5 The following discussion is summarized from Nichols 1981:68ff.

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