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Inflectional features and clausal structure

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Abstract

This paper discusses the relation between verbal inflection and clausal structure, making the claim, based on evidence from Icelandic finite verb inflection, that formal verbal features, such as Number, Person, Tense and Mood, each represents (or corresponds to) a functional head in clausal structure. More generally, the paper claims that there is a one-to-one correspondance between formal features and functional heads in Universal Grammar, that is to say, narrow syntax universally complies to distributed heading, whereas compact heading is confined to (morpho)phonological form, hence giving rise to cross-linguistic variation.

1. Compact versus distributed heading

A central question of linguistic inquiry is: How much machinery do we need in order to account for the clausal engineering of language? In particular: How many functional heads (Fs) do we need? Most of the work of Chomsky (e.g. 1965, 1981, 1995, 1998, 1999) aims at a trimmed system, with few Fs, whereas works such as those of Rizzi (1997) and Cinque (1999) proliferate Fs, thereby blowing up sentential structure into unexpected but perhaps unavoidable dimensions.

Verbal inflection is probably the linguistic domain or phenomenon that is most likely to shed light upon this important issue. Many well-known verb inflection systems involve the following features or categories:

(1)   Number, Person, Mood, Tense, Voice, Aspect

While voice and aspect tend to be expressed periphrastically, tense, mood, person and number typically interact in finite forms, as illustrated for the Icelandic verb *fara* 'go, leave; begin' in the following paradigm:

(2)			Pres. Ind.	Pres. Subj.	Past Ind.	Past Subj.	(Inf.)
Sg.		1p	*fer*	*fari*	*fór*	*færi*	*(fara)*
		2p	*ferð*	*farir*	*fórst*	*færir*	
		3p	*fer*	*fari*	*fór*	*færi*	
Pl.		1p	*förum*	*förum*	*fórum*	*færum*	
		2p	*farið*	*farið*	*fóruð*	*færuð*	
		3p	*fara*	*fari*	*fóru*	*færu*	

Facts of this sort raise the following, obvious question:

(3)   Does the finite verb visualize or represent only one functional head, F, hosting many features, or does it represent many heads, each hosting only one feature (or at least only few features)?

More generally: Does language opt for *Compact Heading* or for *Distributed Heading*? The issue has been widely discussed since Pollock (1989) first proposed the split-Infl hypothesis, see for instance the above mentioned works as well as Thráinsson (1996), Platzack (1998), Bobaljik & Thráinsson (1998) and many others.

In *Aspects*, Chomsky (1965) assumed the simple compact heading approach in (4), where Aux contains all the formal verbal features of the clause, such as number, person and tense:

(4)   S → NP Aux VP

This simple approach carried over to the system assumed in *Lectures* (Chomsky 1981), with Infl corresponding to Aux, and it is still present in

Derivation by Phase (Chomsky 1999), with T(ense) corresponding to Aux or Infl.

In contrast, Pollock (1989) suggested that Tense should be split from Agr (= agreement), and many have since adopted this view. Among the best known versions of this approach are those of Bobaljic and Jonas (1996) and of Collins and Thráinsson (1996), where it is assumed that Aux or Infl should be split into three clausal heads: a subject agreement head, AgrS, a tense (and mood) head, T, and an object agreement head, AgrO - in that order. Accordingly, the heads that determine clausal structure come in the order shown in (5), and the major constituents of the clause are the corresponding ones in (6) (where the subject NP is a specifier within AgrSP):

(5)   AgrS - T - AgrO - V

(6)   AgrSP - TP - AgrOP - VP

As seen, the "work" done by Aux in (4) has here been devided between AgrSP, TP and AgrOP. - The verb, it is assumed, moves from V through AgrO, T and AgrS, thereby "collecting" or at least checking or matching its inflectional features.

This approach was to a large extent developed in order to account for certain syntactic facts in Icelandic (that do not concern us here). However, in verb inflection systems of the Icelandic type, and, more generally, of the most common Indo-European type, AgrO is typically "inactive" or "invisible", i.e. the verb normally inflects for tense and for number and person of the subject (T and AgrS thus being "active"), but not for person and number of the object (but, as we shall see, there are certain exceptions to

this generalization in Icelandic). For languages of this type, without general object agreement, one might thus want to assume (7) instead of (5) (with mood being hosted by T as in (5)):

(7)   AgrS - T - V

This, however, immediately raises two questions: why should person and number be hosted by a single functional head, AgrS, and, by the same rationale, why should tense and mood be glued together under a single functional head, T? The logic of such an intermediate solution, with a "half-compact" or a "half-distributed" heading, is unclear.

    If Aux or Infl is to be split at all, it seems straightforward that it should be fully split, into its basic units, (minimally) as in (8):

(8)   Num(ber) - Pers(on) - M(ood) - T(ense)

If so, the "verb-projection part" of the clause has at least the major constituents in (9) (where the canonical subject position is the specifier of NumP):

(9)   NumP - PersP - MP - TP - VP

In section 2, I shall take a closer look at verb inflection evidence from Icelandic, strongly suggesting that this language opts for distributed heading. In section 3, I shall claim that this conclusion enables us to deduce that distributed heading is in fact a universal property of language.

2. Icelandic distributed heading

The Icelandic evidence that I want to present here regards the distinction between tense and mood on one hand and the distinction between number and person on the other hand. In other words, I shall first show that tense and mood have distinct exponents in the language and then I shall show that person and number are also morphosyntactically distinct from each other.

2.1 Tense and mood

Like many other Indo-European languages, Icelandic has numerous verb inflection or conjugation classes, i.e. it has three or four basic classes of weak verbs and six strong ablaut series (plus many subclasses and irregularities). However, most verbs display the same number and person endings (apart from certain variation in the Pres. Ind. Sg., that does not concern us here).

Consider the following paradigm of the verb *leita* 'search, look for', belonging to the largest and most regular weak class:

(10)			Pres. Ind.	Pres. Subj.	Past Ind.	Past Subj.	(Inf.)
Sg.		1p	*leita*	*leiti*	*leitaði*	*leitaði*	*leita*
		2p	*leitar*	*leitir*	*leitaðir*	*leitaðir*	
		3p	*leitar*	*leiti*	*leitaði*	*leitaði*	
Pl.		1p	*leitum*	*leitum*	*leituðum*	*leituðum*	
		2p	*leitið*	*leitið*	*leituðuð*	*leituðuð*	
		3p	*leita*	*leiti*	*leituðu*	*leituðu*	

While past tense as such has the obvious exponent *-ð-* (or *-að-/-uð-*, depending on regressive *u*-umlaut or vowel harmony), it is not clear that the subjunctive has any special marker. In this paricular class, the whole past tense is the same in the indicative and the subjunctive, i..e. the subjunctive

does not seem to have any marker in the past. In the present tense, *-i-* is the obvious candidate as a subjunctive marker, but the generalization seemingly breaks down in the first person plural.

In spite of these somewhat unpromising premises, I suggest that *-i-* is indeed a general subjunctive marker in the language, being "hidden" in the past tense by a vowel truncation rule. If so, the "underlying" forms of the present and past subjunctive (prior to *u*-umlaut) are as shown in (11):

(11)			Pres. Subj.	Past Subj.
Sg.		1p	leita-i-i	leita-ð-i-i
		2p	leita-i-ir	leita-ð-i-ir
		3p	leita-i-i	leita-ð-i-i
Pl.		1p	leita-i-um	leita-ð-i-um
		2p	leita-i-ið	leita-ð-i-uð
		3p	leita-i	leita-ð-i-u

In the present tense, a regressive vowel truncation rule, applying to *V-V*, first deletes the stem-final *-a-*, and then, on a second cycle, deletes the subjunctive *-i-* marker except, of course, in the third person plural (the rule takes the general form $V_1V_2 \rightarrow \emptyset V_2$, where $\emptyset$ denotes a deleted vowel). In the past tense, the rule applies only once, deleting all, occurrances of the subjunctive marker.

However, the language has not only a regressive vowel truncation rule, applying to *V-V*, but also a pogressive one ($V_1V_2 \rightarrow V_1\emptyset$, cf. Indriðason 1994, 125-127). The division of labor between these rules is largely morphologically (rather than phonologically) decided, but it would take us too far to demonstrate this. We have already seen instances of the regressive rule, but it is also operative across word boundaries, as in (12), where it deletes the final *-a* of *tala* and *-i* of *dæmi* in front of a following vowel:

(12) a (Ég) tala um það = [tʰal Ym ða]
          (I) talk about it
      b (Ég) dæmi hana = [taim ana]
          (I) judge her

The progressive vowel truncation, on the other hand, applies regularly across the suffixed definite article boundary, as informally illustrated in (13):

(13) a Nom. sg.   /kona-(h)in/   = *konan* 'the woman' (lit. womanthe)
      b Acc. sg.   /konu-(h)ina/ = *konuna*

In addition, I assume, the progressive rule applies in the present indicative singular, whereas the regressive rule applies everywhere else (in the whole verb inflection system). Compare the "underlying" and the "surface" forms in the present tense:

(14)

		Pres. Ind.		Pres. Subj.		
Sg.	1p	leita-i	= *leita*	leita-i-i	= *leiti*	
	2p	leita-ir	= *leitar*	leita-i-ir	= *leitir*	
	3p	leita-ir	= *leitar*	leita-i-i	= *leiti*	
		$V_1V_2 \rightarrow$	$V_1\emptyset$	$V_1V_2V_3$	$\rightarrow$	$\emptyset\emptyset V_3$
Pl.	1p	leita-um	= *leitum*	leita-i-um	= *leitum*	
	2p	leita-ið	= *leitið*	leita-i-ið	= *leitið*	
	3p	leita	= *leita*	leita-i	= *leiti*	
		$V_1V_2 \rightarrow$	$\emptyset V_2$	$V_1V_2V_3$	$\rightarrow$	$\emptyset\emptyset V_3$
				V_1V_2	$\rightarrow$	$\emptyset V_2$

In passing, it should be pointed out that   the Present Indicative Singular quite generally applies a different set of rules than the other tenses/numbers.

The suggesion that *-i-* is a general subjunctive marker in the language gains support from both historical and synchronic evidence. The historical evidence stems from the fact that the the plural subjunctive endings

underwent a change (mainly from 1300 to 1500, cf. Sigurðsson 1980), to the present endings from *-im* in first person past and present and *-ið* and *-i* in the past tense. This is sketched for *leita* in (15):

(15)   Modern Icelandic   Old Icelandic
                  Pres. Subj.   Past Subj.   Pres. Subj.   Past Subj.
      Pl.   1p   *leitum*   *leituðum*   *leitim*   *leitaðim*
            2p   *leitið*   *leituðuð*   *leitið*   *leitaðið*
            3p   *leiti*   *leituðu*   *leii*   *leitaði*

The picture is complicated and obscured by the fact that a different kind of change also took place in the first person singular, but accounting for that would take us too far afield.

Now, consider the "underlying" forms in both Old and Modern Icelandic:

(16)   Pres. Subj.   .   Past Subj.
      Pl.   1p   leita-i-um   leita-ð-i-um
            2p   leita-i-ið   leita-ð-i-uð
            3p   leita-i   leita-ð-i-u

As we have seen, a *regressive* vowel truncation rule ($V_1V_2 \rightarrow ØV_2$), deleting the subjunctive marker (as well as the stem-final *-a-* in the present) gives us the modern forms (*-um*, etc.). This regressive rule must also have applied to the stem-final *-a-* in the present tense in Old Icelandic, yielding the intermediate stage in (17):

(17)   Pres. Subj.   Past Subj.

      Pl.   1p   leit-i-um   leita-ð-i-um
            2p   leit-i-ið   leita-ð-i-uð
            3p   leit-i   leita-ð-i-u

On the second cycle, however, a *progressive* vowel truncation rule applied to *V-V* ($V_1V_2 \rightarrow V_1\emptyset$), yielding all the old forms (*-im*, etc.). Accordingly, the change can be analyzed such that it involved a single change in directionality of the second cycle vowel truncation, from progressive (resluting in $V_1\emptyset$) to regressive (resulting in $\emptyset V_2$). – Obviously, this account is only available if we assume a special subjunctive marker.

In many paradigms, mood is either not overtly marked at all in the past subjunctive, as for *leita* in (10) above, or only marked by *i*-umlaut in the stem, as for *fara* in (2) above (where *æ* in e.g. *færi* is *i*-umlaut of *ó* in *fór-*). However, yet other paradigms provide striking evidence in favor of analyzing *-i-* as a "hidden" marker of mood in the past subjunctive. Two such paradigms are shown below, for *taka* 'take' and *ganga* 'walk':

(18)			Pres. Ind.	Pres. Subj.	Past Ind.	Past Subj.	(Inf.)
	Sg.	1p	*tek*	*taki*	*tók*	*tæki*	*(taka)*
		2p	*tekur*	*takir*	*tókst*	*tækir*	
		3p	*tekur*	*taki*	*tók*	*tæki*	
	Pl.	1p	*tökum*	*tökum*	*tókum*	*tæk**j**um*	
		2p	*takið*	*takið*	*tókuð*	*tæk**j**uð*	
		3p	*taka*	*taki*	*tóku*	*tæk**j**u*	

(19)			Pres. Ind.	Pres. Subj.	Past Ind.	Past Subj.	(Inf.)
	Sg.	1p	*geng*	*gangi*	*gekk*	*gengi*	*(ganga)*
		2p	*gengur*	*gangir*	*gekkst*	*gengir*	
		3p	*gengur*	*gangi*	*gekk*	*gengi*	
	Pl.	1p	*göngum*	*göngum*	*gengum*	*geng**j**um*	
		2p	*gangið*	*gangið*	*genguð*	*geng**j**uð*	
		3p	*ganga*	*gangi*	*gengu*	*geng**j**u*	

What should be noticed here is the (boldface) "extra" *j* in the past subjunctive plural, i.e. in *tækjum*, *gengjum*, etc. This "extra" *j* is the orthographical reflection of a regular palatalization of *g* and *k* – conditioned by an immediately following *i* (=[I]; the rule is actually more general, cf.

Indriðason (1994, 106-108), but this is immaterial here). The palatalization rule can be informally stated as in (20), where, for the sake of typographical simplicity, the clusters *gj* and *kj* represent palatilized /g/ and /k/, respectively:

(20)   g, k   →   gj, kj / __ i

In the orthography, the palatalization is never reflected in front of *i*, whereas it is regularly reflected by an "extra" *j* in front of either *a* or *u*.

What this means is that /k/ and (stem-final) /g/ are palatalized throughout in the past subjunctive in (18) and (19). The palatalization is not reflected by the orthography in the singular, whereas it is in the plural. At the face of it, however, the trigger for palatalization is lacking in the plural, i.e. given only the "surface" forms the palatalization in the plural would be puzzling. If, one the other hand, we are right that there is a "hidden" mood marker, *-i-*, in the past subjunctive, then the palatalization is precisely what we would expect. The "underlying" plural forms are then as shown in (21) (where, of course, the *i*-umlaut, *æ*, is not shown in /tók-/):

(21)   *taka*   *ganga*
      Pl.   1p   tók-i-um   geng-i-um
            2p   tók-i-ið   geng-i-uð
            3p   tók-i-u   geng-i-u

In both *taka* and *ganga* the mood marker, *-i-*, triggers palatalization of /k/, /g/ prior to the application of the regressive vowel truncation rule (deleting the palatalization trigger).

In sum, there is convincing evidence, both historical and synchronic, that Icelandic has a mood marker that is distinct from tense. This is precisely what we expect if Icelandic opts for distributed heading rather than compact heading. However, we postpone further discussion of the issue.

2.2 Number and person

Icelandic finite verb agreement is basically of the well-known type, where the verb agrees in number and person with its nominative subject, as in (22):

(22) a Hún **hefur** lesið þessa bók.
          she(Nom) has(3sg) read this book(Acc)
      b Við **höfum** lesið þessa bók.
          we(Nom) have(1pl) read this book(Acc)

However, Icelandic also has the famous typological cuirosity of having so-called quirky or non-nominative subjects, most commonly in the dative (Zaenen, Maling and Thráinsson 1985, Sigurðsson 1989, Jónsson 1996 and many others). The finite verb never agrees with such subjects, i.e. in the absence of a nominative argument, the finite verb shows up in the default third person singular, as in (23):

(23) a Stundum **hefur** rignt mikið hérna.
          sometimes has(3sg) rained much here
          'It has sometimes rained much here.'
      b Okkur **hefur**/*höfum oft leiðst hérna.
          us(Dat) has(3sg)/*have(1pl) often bored here
          'We have often been bored here.'

In contrast, the verb may agree with *nominative objects* in the so-called Dat-Nom construction (where the dative is the syntactic subject and the nominative a direct object). This is illustrated in (24):

(24) a   Henni leidd**ust** þessar athugasemdir.
           her(Dat) bored(3pl) these comments(Nom)
           'She was annoyed by these comments.'

      b   Henni líku**ðu** ekki þessar athugasemdir.
           her(Dat) liked(3pl) not these comments(Nom)
           'She didn't like these comments.'

Crucially, however, object controlled agreement is confined to the third person, that is, first and second person nominative objects (as opposed to subjects) are categorically blocked from controlling agreement. Given that third person is actually [-1p, -2p] or "no person" (as argued by many, e.g. Andersson 1982, 576), the relevant generalization may be stated as in (24) (see Sigurðsson 1996, 34):

(25)   Objects are blocked from controlling [+ Person] agreement

Hence, the following judgements, where agreement is grammatical in the third person but ungrammatical in the first and second person:

(26) a   *Henni líku**ð**um við.   (27) a   *Henni höfð**um** leiðst við.
         her(Dat) liked(1pl) we(Nom)   her(Dat) had(1pl) bored we(Nom)
      b   *Henni líku**ðuð** þið.   b   *Henni höfð**uð** leiðst þið.
         her(D) liked(2pl) you(Npl)   her(D) had(2pl) bored you(Npl)
      c   Henni líku**ðu** þeir.   c   Henni höfð**u** leiðst þeir.
         her(D) liked(3pl) they(N)   her(D) had bored they(N)
         'She liked them.'   'She had found them boring.'

Thus, object controlled agreement is grammatical as long as it involves only number agreement and no ("true" or "active") person agreement.

      The different behavior of Number and Person is most peculiar if Icelandic opts for compact heading, that is, if these features of the finite clause are located under one and the same functional head in Icelandic. If we

were to adopt the analysis in (7) above (where Number and Person are syntactically indistinguishable subparts of AgrS), we would in effect be assuming a contradiction: On one hand, we have to admit the fact that Number and Person do behave differently, depending on their syntactic evironment, as we have seen, but simultaneously we would be claiming that Number and Person nonetheless constitute a minimal syntactic unit.

If, on the other hand, Number and Person are in fact distinct functional heads, as in (8) above, then it is not surprising or problematic that they behave differently. Indeed, as argued by Sigurðsson (2000), their different behavior is then in full accord with well established principles of grammar, such as Relativized Minimality (Rizzi 1990 and many others) and the Principle of Minimal Compliance (Richards 1998, 601).

I conclude that there is evidence that not only T and M but also Num and Pers are distinct in Icelandic.

3. Universal distributed heading

Isolating and in general analytic languages would seem to suggest distributed heading, whereas compact heading would at first sight appear to be the null-hypothesis for fusional languages (cf. Thráinsson 1996). Interestingly, however, our study of Icelandic verb inflection illustrates or at least strongly suggests that even highly fusional languages like Icelandic opt for distributed heading - hence the "multiple divorce" of Tense, Mood, Person and Number that we have observed.

This would be a striking and a most surprising result if languages freely opt for either distributed or compact heading. Instead, let us assume that distributed heading is a fundamental property of Universal Grammar

(UG), compact heading thus being unavailable in narrow syntax (as opposed to PF, i.e. phonlogy and morphology in a broad sense). If so, UG has the *Feature Uniqueness Principle* (cf. Sigurðsson 2000):

(27)   Any formal feature of UG is represented by a single functional head and any functional head of UG uniquely represents a single formal feature

Indeed, given straigthforward minimalist assumptions, it must be the case that a formal feature **is** a functional head and vice versa.

It is obviously not a logical necessity that distinct features should be glued together under one and the same functional head, say, for instance, person and tense, or number and mood, gender and person, and so on. As a matter of fact, these and many other features are grouped together differently in different languages. Thus, for instance, person and number show up on the negation in Finnish and not on the verb (as they do in non-negated clauses, on the other hand):

(28)   a   Tanssi**tte**.
                 (you) danced(2pl)
        b   E**tte** tanssineet.
                 not(2pl) danced(perf)

Different grouping and/or fusion of formal features in different languages is plausibly not a property of narrow syntax but brought about by cross-linguistically varying strategies at PF, PF thus being much more "syntactic" than usually believed (as e.g. in Halle & Marantz 1993). This discrepancy between narrow syntax and PF accounts for the variation and tension between fusional and isolating strategies, both within individual languages and cross-linguistically.

Chomsky (1999, p. 2) formulates the *Uniformity Principle* as follows:

(29)   In the absence of compelling evidence to the contrary, assume language to be uniform, with variety restricted to easily detectable properties of utterances.

Let us assume the understanding that "variety restricted to easily detectable properties of utterances" is "surface" variety, confined to PF. If so, the Feature Uniqueness Principle and distributed heading follow directly (compact heading, on the other hand, being a property of PF, hence cross-linguistically varying). Thus, we come to the radical but logical conclusion that ***all*** linguistic variation, including parameter settings, is on the PF side – which means that PF must have access to considerable amount of "syntactic" information (for related ideas, see Holmberg 2000).

There can be no question that language is uniform at some level, referred to as *Universal Grammar* in Chomsky 1999 and related work. This is almost trivially and therefore uninterestingly true. The interesting questions are: What are the properties of Universal Grammar and what is the level of abstraction required to describe these properties?

The usual assumption is that parameter setting is syntactic in nature. If so, however, we would expect narrow syntax to vary from language to language and we would thus expect compact heading to be a truly syntactic option in language. It is not obvious how an approach along these lines would differ from a claim to the effect that there are in fact many "Universal Grammars", with e.g. many different versions or types of compact headings.

Let us assume instead that Universal Grammar is ideed "radically universal" in the sense that the initial language stage of each child (prior to birth) is identical. As soon as the child gets some evidence, however, he or she

immediately starts setting parameters, first prosodic and other purely phonological parameters and then (more) morphological and syntactic ones. If this is the case, then it must be true that the minimal building blocks of universal grammar are atomic in nature, namely individual features and not feature bundles.

On the assumption that "the phonological cycle is not a[n] … independent cycle, but proceeds essentially in parallel" with the "narrow-syntactic cycle" (Chomsky 1999, p. 9), we come to the conclusion that parameters, including varying types of compact headings, are set on the basis of phonosyntactic evidence and hence belong to PF (or "phonosyntax") and not to narrow syntax.

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