MORPHOLOGICAL RICHNESS
VS. COMPLEXITY IN INFLECTION

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Abstract: Based on the model of Natural Morphology, the following is proposed: productivity is a constitutive primitive property of patterns of the core of inflectional morphology. Morphological complexity contains all the morphological patterns of a language, whereas morphological richness is calculated only in terms of productive morphological categories, rules and inflectional microclasses. Accordingly, inflectional morphology is only slightly richer in French than in English, but less rich than in Italian. The ideal type of an inflecting-fusional language has an inflection which is both rich and very complex. The ideal type of an agglutinating language has a very rich morphology but no unproductive patterns which would extend complexity beyond richness.

This contribution explores the wide-spread intuition that the inflectional morphology of some languages is richer or more complex than that of other languages. Such intuitions have been used in speculations about glottogony, e.g. in Johann Gottfried Herder's prize-winning essay of 1771 "Abhandlung über den Ursprung der Sprache", where Herder speculates that originally human language had no morphology at all, and that less civilised languages have irregular morphologies. In the domain of foreign language learning, the inflectional morphologies of some languages are thought to be more complex than those of others. Notions of morphological complexity have been elevated to scientific concepts particularly within the area of morphological typology, where more isolating morphologies are said to be less rich or complex than those of other language types. But how do agglutinating languages compare with inflecting ones? Which language type has a more rich/complex morphology?

Outsides of linguistics, there exist various approaches to complexity. One consists in dividing between positive and negative complexity. This division may be applied, within linguistics, to the wide-spread positive attitude towards morphological regularity as opposed to a negative attitude towards irregularity. A positive attitude is taken in constructivist frameworks which describe the self-organizing emergence of complexity in physical, chemical and biological systems as a spontaneous generation/increase of complexity. In this vein, constructivist and emergentist models of language acquisition describe how children construct and reconstruct, step by step, the complexity of their target morphologies. This conception is usually combined with an item-and-arrangement model or word-and-paradigm model of morphology which corresponds to a building-block or part-whole model of complexity models as an expression of organizational and structural depth. Computational models would measure complexity in terms of logical depth, i.e. of execution time required to generate a given object.

Following such models, we can define an inflectional paradigm as the set of all inflectional forms of one word or (more precisely) of one base (word, stem, root), a system of inflection as the set of all paradigms formed from bases belonging to the same word class, e.g. the two systems of declension of nouns and of conjugation of verbs, and finally an inflectional *subsystem as the part of a system defined by one morphological category, e.g. present tense or* indicative mood or, hierarchically successively lower, present indicative, present indicative singular, etc.

Morphological richness/complexity can then be calculated in the number of hierarchical layers (vertically) and of members of each layer (horizontally), i.e. similar to what descriptive grammars do anyway. But this must be done separately for each inflectional system, since incorporating polysynthetic languages often have a luxurious verb inflection but a poor noun inflection, whereas some agglutinating languages such as Bask have a richer/more complex inflection in nouns than in verbs.

Since it has little sense to use morphological richness and morphological complexity as synonyms, I'm going to propose a plausible distinction, in view of the fact that richness often has positive connotations, complexity negative ones. This distinction is based on the following assumptions (more in Dressler & Thornton 1996, Dressler et al. 1995, Dressler 1997): basic inflectional patterns are:

a) morphological category = morphologically expressed grammatical meaning with distinct meaning and with, at least sometimes, distinct formal expression (marker);

b) inflectional paradigms (s. above) forming hierachically microclasses, subclasses, classes, macroclasses.

c) inflectional microclass = set of paradigms which share exactly the same morpho(no)logical generalizations; an isolated paradigm (= a paradigm which differs morpho(no)logically from *all other paradigms) does not form a microclass of its own but is considered a satellite to the* most similar microclass;

c) morphological rules expressing categories and producing paradigms from morphological bases (and decomposing them) [their conception being theory-specific, the underlying theory of this contribution is the model of Natural morphology, cf. Kilani-Schoch 1988];

d) productivity is proposed to be a constitutive primitive property of patterns/rules in inflection (as in word formation, syntax, phonology), i.e. the core of morphology is considered to be a human tool for producing, and accounting for, potential words and word forms, and, in the unmarked case, in the least restricted form, i.e. productively. Thus productive categories, rules and microclasses represent the core of morphology in any language. (Note that regularity is a hyperonym of rule productivity, because there exists the marked case of unproductive rules).

This allows us to differentiate morphological richness vs. complexity. Morphological richness can be seen as a hyponym of morphological complexity. Whereas morphological complexity contains all the morphological patterns of a language, both productive and unproductive ones, morphological richness should be calculated only in terms of productive morphological categories, rules and inflectional microclasses. For all inflectional forms which belong to unproductive categories, rules, paradigms or microclasses are lexically stored (according to realistic models of the mental lexical) and thus do not belong to the active mechanism of morphology.

As a result, e.g., the productive part of synthetic inflectional morphology of spoken French (at least français avancé) is restricted in the verb to the categories of persons, indicative, imperative and conditional mood, present and imperfect tense, infinitive and participles, and, among the paradigms, to the microclass parler. The productive part of adjective inflection (but not noun inflection) consists in expression of gender and in non-zero plural formation in -al --> -aux (unless one counts reanalysis to prefixal z-).

Accordingly, inflectional morphology is only slightly richer in French than in English, but less rich than in Italian, whose nouns and adjectives have productive non-zero plural formation for one microclass of masculines (libro 'book') and feminines (casa 'house'). In the verb, there are the additional productive categories future, preterit, subjunctive, and a second (albeit only slightly) productive microclass (finisco, finire, finito 'to finish').

Lack of space obliges me to illustrate my point only with the number of productive microclasses of verbs. English, Dutch and German have just one productive microclass, i.e. weak verbs (thus similar to French).

Slovene, however, has the 4 productive microclasses (with stress position added): 1) Inf. dél-a-ti 'work', Part. dél-a-l, 3.Sg.Prs. dél-a, Imp. dél-a-j; 2) Inf. mísl-i-ti 'think', Part. mísl-i-l, 3.Sg. = Imp. mísl-i; 3) Inf. bóks-n-i-ti 'box (pfv.)', Part. bóks-n-i-l, 3.Sg. bóks-n-e, Imp. bóks-n-i; 4) Inf. kup-ov-á-ti 'buy', Part. kup-ov-á-l, 3.Sg. kup-új-e, Imp. kup-új.

Polish conjugation has 7 productive microclasses, i.e. (the forms given are: Inf., 1.Sg., 3.Sg., 3.Pl.Prs., 2.Sg.Imp., 1.Sg. masc. Pret, PPP): 1) kup-ow-ać 'buy', kup-uj-ę/-e, kup-uj-ą, kup-uj, kup-ow-a-ł-em, kup-ow-a-n-y; 2) pis-yw-ać 'write (iterativ)', pis-uj-e...; 3) siw-ie-ć 'become grey', siw-ie-j-ę/-e/-ą, siw-ie-j, siw-ia-ł-em, siw-ia-n-o; 4) krzyk-n-ą-ć 'cry (pfv.)', krzyk-n-ę/-ie/-ą, krzyk-n-ij, krzyk-n-ą-ł-em, krzyk-n-ię-t-y; 5) waż-y-ć 'weigh', waż-ę, waż-y, waż-ą, waż, waż-y-ł-em, waż-o-n-y; 6) nos-i- ć 'carry', nosz-ę, nos-i, nosz-ą...; 7) koch-a-ć 'love', koch-a-m, koch-a, koch-a-ją, koch-a-j, koch-a-ł-em, koch-a-n-y.

Morphological complexity, however, must be calculated in terms of the total learning effort devoted to inflections, sc. it contains also the often negatively valued unproductive patterns of

a language. Thus all unproductive categories (e.g. French comparatives, pronouns), rules, microclasses and isolated paradigms (e.g. suppletive and defective verbs) have to be taken into account.

Extrapolating from such analyses, we can state: typically, the richer an inflectional system of an Indo-European language is, the more complex it is as well. Exceptions exist, however, e.g., Polish verb inflection is richer, but less complex, than Croatian verb inflection. The ideal type (in the sense of Skali ka 1979) of an inflecting-fusional language has an inflection which is both rich and very complex. The ideal type of an agglutinating language, however, has a very rich morphology, which corresponds perfectly to the much larger role that morphology plays in respect to syntax in this language type, when compared with inflecting languages. But there are, ideally, no unproductive morphological patterns which would extend complexity beyond richness. Turkish comes very close to this ideal. As predicted, Hungarian which is less typically agglutinative by having some ingredients of inflecting-fusional morphology, has some unproductive patterns both in noun and verb inflection. The complexity of Hungarian inflection is thus higher than its richness.

I have not yet been able to calculate morphological richness vs. complexity of an incorporating polysynthetic language, since measuring productivity is impossible without the help of a native-speaker linguist or of a linguistically very sophisticated native speaker, and since so far I did not have the possibility of working with such a person. Nevertheless already now the differentiation between morphological richness and complexity appears to be typologically pertinent. Moreover, morphological richness appears to be more relevant for characterizing languages, language types and language contrasts than morphological complexity per se.

The differentiation of morphological richness and complexity is also relevant for functional analysis of morphology, because only productive morphological patterns are fully functional.

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