Word Formation and Typology: Which Language Universals?

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1.   Introduction

Typology was born with morphology, at least taking into consideration the old Humboldtian idea of comparing language types (isolating, inflectional, etc.) on the basis of the morphological properties of words (for a survey cf. Coseriu 1973). In this perspective, a central role was played by inflectional morphology, at least in its prototypical core. This is not surprising because of the "paradigmatic" nature of inflectional morphology, which allows one to identify categories and values in a rather precise way (cf. on this subject Ricca in press). This very nature is probably the reason why typological investigations on (some aspects of) inflectional morphology have been extremely fruitful both from a synchronic (just to mention a few, see for instance Blake 2001, Corbett 1991, 2000) and a diachronic perspective: consider in this latter respect the exemplary volumes by Bybee, Perkins & Pagliuca (1994), in which the source and the distribution of inflectional morphemes is investigated on the basis of a well-balanced language sample. Furthermore, the occurrence of well-profiled categories has favored the formulation of Greenbergian universals such as: "If a language has a trial, it also has a dual".

   Therefore, generalizations of a typological character involving inflectional morphology are numerous, even though in several cases still requiring an empirical validation. Much less so for derivational morphology and in general for word formation. In this respect, it is interesting to consult the Universals Archive (= UA) worked out by F. Plank and E. Filimonova at Konstanz University. The archive, which records about 2000 universals of various character occurring in typological literature, allows one to obtain an overview on what can be considered "received wisdom" in typology. Compared to approximately 170 universals concerning inflectional morphology, for derivational morphology the number of possible universals amounts to about 60, which illustrates how difficult it is to adopt a typological perspective when dealing with the latter. In the rest of the paper, I intend primarily to explore what is the state of the art for typology and derivational morphology, and in doing so I will rely on the Konstanzer archive.

   Among the universals sampled in the archive, there are two basic types (in the rest of the paper, the archive universals will be identified by their archive number). The first type consists in unrestricted or non-conditional universals, which assert general properties of language:

#919   As the number of contrastive segments in a language increases, the average length of a word will decrease.

#662   There is no reduplication pattern which would not involve reference to lexical identity.

The properties asserted in such universals are conditions holding achronically in the first example as for the form of lexical morphemes, and in the second one as for the derivational meaning ("Wortbildungsbedeutung") of a certain derivational process (reduplication). Furthermore, there are implicational universals, which relate the occurrence of two properties of language:[1]

#892   OV languages tend to have suffixes and VO languages prefixes.

In this contribution I will attempt on the basis of the data provided by the UA a first exploration of the principal traits of word formation from a typological point of view, and I will attempt to establish a minimal set of prerequisites which a typology of derivational morphology must display to answer Bauer's (2002) question on what the latter is definitely able to do. I must admit that this paper will only contribute to raise more questions instead of providing answers. Thus, it can be intended either as a *cahier de doléance* or as it really is, namely a research project. However, my conviction is that raising correct questions already offers the key to find right answers.

2.   Delimiting the Field

The first problem to face is how to discriminate whether a morphological process is to be attributed to inflectional morphology, or rather to derivational morphology. In this respect the criteria usually assumed to distinguish between the two do not always provide reliable results. One could even ask whether the distinction is of a categorial (and so qualitative) or rather of a quantitative nature, and this in turn implies a theoretical model to which one may refer. I will not pursue this issue here, and rather refer the reader to the literature (cf. among others at least Scalise 1988, Dressler 1989, Anderson 1992).

Among the several approaches to the question, Haspelmath's (1996) paper is very telling, since he attributes to inflectional rules the property of changing word class, a criterion usually held to be fundamental to define prototypical word formation. This might be true but, as the author admits, only under certain conditions, i.e. with non-prototypical inflection: participles, verbal adjectives, infinitives, and so on. In this uncertainty, light can be shed by proceeding in an empirical way taking into consideration single categories expressed by single morphological markers. This is for example the procedure followed by Bauer (2002). This procedure is not without contradictions. Among the derivational patterns of Kwakw'ala, Anderson (1985)

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[1] As pointed out by Plank in the guidelines of UA, several allegedly implicational universals recorded have a para-conditional status rather than an implicational one. One such universal is the following one:

        #219   In all languages: if there are non-root morphemes, then all such morphemes have a more limited inventory of phonemes than root-morphemes and the average length of non-root morphemes is not more than the length of root-morphemes.

In this case the condition can be paraphrased by "assuming that, given that", and the positive formula does not coincide with the negation of the contrary: If p then q ≠ If ¬q then ¬p. Furthermore, the question arises whether the asserted correlation is relevant or not at a typological-structural level. In this sense, the following universal does not appear to highlight a relevant language property, since its domain is too narrow:

        #1581   If there is a reflexive verb meaning 'to laugh' it is usually not derived from the transitive base meaning 'to make somebody laugh'.

mentions affixes (see the examples in (1) below) corresponding to what in many languages are inflectional categories: temporal (future, recent past, remote past, etc.), aspectual (inchoative, habitual, repetitive, etc.), voice, modality (optative, potential, exhortative, etc.), noun plural (simple plural, distributive, etc.):

(1) $x^w ak^w ə na$ 'canoe' → $x^w ak^w ə n\lambda$ 'canoe that will be, that will come into
                                existence'
        $x^w ak^w ə na$ 'canoe' → $x^w ak^w ə naxdi$ 'canoe that has been destroyed'

The main argument to support his approach is given as follows:

> "[I]t is hard to find secure criteria for classifying these elements as derivational or inflectional: we take it to be significant for the derivational status of at least the temporal, aspectual and plural groups that they are (a) optional, and present only where necessary for emphasis or disambiguation; and (b) equally applicable to words of any syntactic function or word class … These forms involve the same suffixes as those appearing with verbs to mark the same categories, and this is general across all members of these classes" (Anderson 1985: 30)

The argument in favor the derivational status of these tense markers is of a distributional nature: the affixes occur with different word classes. Notice that this argument allows one to interpret the affixes as operating a transcategorization, changing word class. This makes these affixes in a way similar to the Dutch example of bracketing paradox reported in (2), for which Booij (2002: 161) assumes a conversion from noun to verb, which is however only contextually conditioned:

(2)   *breedgeschouderd* 'broad-shouldered'   [A [[*ge-* [N]$_V$ *-d*]$_V$]$_A$]$_A$

The theoretical justification is again of a distributional nature, since the conversion pattern is independently well-established in Dutch. The bracketing paradox is solved once that one expresses "that certain independently established word formation patterns co-occur: the use of one pattern implies the use of the other" (Booij 2002: 161). We would clearly ascribe neither the Dutch affix nor the category to which it belongs to derivation. We would rather speak of conversion, or of zero derivation, depending on the theoretical persuasion, assuming an abstract derivational level. However, in the light of the Kwakw'ala verbalizing suffixes, nothing prevents us from considering the affix derivational!

These uncertainties require a very careful approach, which not only looks at the individual patterns, but more in general considers the whole morphological structure of a language. Adopting Bauer's procedure condemns us to replicate his negative results, as for instance for derivation producing nouns:

> "There are no implicational scales observable here. There are languages which appear to allow abstract nouns derived from adjectives without allowing abstract nouns derived from verbs (though the latter could be counted as inflectional, it must be recalled)" (Bauer 2002: 40)

Given the difficulty of discriminating between inflection and derivation, it seems to me a better alternative to check if implications come out, when morphology as a

whole is considered. In my opinion, in order to verifiy if there are interesting connections in form-function relations, it is first necessary to ask what is morphologized, and then look for more fine-graded distinctions in terms of inflection/derivation (see for instance Noonan 1997).

Related to this question is the problem of determining which and how many are the word classes in a given language (see on the question Comrie & Vogel 2000). In fact, the debate on whether at least nouns and verbs must be considered universal categories is still open (compare for instance Sasse 1993 vs. Mithun 2000). Establishing the nature and the kind of word classes also allows one to specify the selection domain of word formation rules, even though Plag (1999: 144) has recently pointed out that "one could even come up with the strong hypothesis that with any given productive affix, the syntactic category of potential base words is only a by-product of the semantics of the process" (Plag 1999: 144). In this view, the role played by word classes in morphology is strongly diminished.

Moreover, the problem arises of verifying whether there exist derivational categories that can be considered "universal" similarly to those assumed for inflectional morphology, in order to look on this basis for possible implicational universals (see in this regard the scepticism of Bauer 2002), as the following one:

#1945   If a language has denominal derivation, it has nominal derivation (= derivation of something else to nouns).

Again, here the approach must be probably broader, and more "functionally"-based, in the sense of first looking at general strategies adopted by languages to carry over specific functions such as nominalization, verbalization, modification in the verbal (i.e. adverbs) and in the nominal (i.e. adjectives) domain, intensification / evaluation, etc. Only after this scrutiny might fine-graded morphological investigation really start.

Connected with word classes is the question of derivational categories or types. Also on this subject opinions are diverging (see Scalise 1999 for a discussion), but it can be generally agreed that derivational types are rather neglected within the theoretical debate, the only exception being Zwanenburg's (1980, 1984) framework. Should derivational categories be assumed as general viewpoints, under which to look for generalizations, or are they simply to be discarded since constituting a mere abstraction, meaningless for a "morpheme-based" approach? In the archive a universal responding to such a question regards (perhaps expectedly...) evaluatives:

#2015   Suggested hierarchy of base types for diminutivisation and augmentativisation: Noun > Adjective, Verb > Adverb, Numeral, Pronoun, Interjection > Determiner.

Finally, one has to ask: how are the morphological techniques connected with the functions they perform? This question is in a way specular to what has just been said above because it is related to the expression side of morphology. For instance, it must be investigated whether there are strict relations between morphological techniques and lexical classes, as claimed by the following universal:

#1746   There is more prefixing on verb than on noun. If a language has any prefixes on noun, it will also have prefixes on verb with considerably more than chance frequency.

Moreover, it is not without interest to ascertain whether with respect to certain morphological techniques it is possibile to sustain generalizations such as for instance "In a given language if composition expresses action nouns, then it also expresses agent nouns". In this sense consider the following universal concerning reduplication:

#1868   IF reduplication is used for grammatical purposes in any other word class, THEN it is also used (for whatever purpose: gradation, superlative, intensification, distributivity, diminution, etc.) for adjectives or adjective-derived nouns.

In this vein, it would be interesting to know what is the range of possible derivational meanings expressed by affixation with respect to composition, or the relation between endocentric and exocentric composition, and so on.

3.   Universals and Word Formation

After having touched upon these questions of a general character, which have rather been hinted at than answered, let us now consider the archive in search of morphological universals and more in particular of universals concerning word formation. As reported in the archive, the sum of universals connected with morphology amounts to about 230, among which a first set concerns morphology as such, independent of the morphological categories involved. A second set is of a transmorphological character since it concerns the connection of morphology with other language components, especially phonology and syntax. A third set of universal is specified for inflectional morphology; they will not be discussed here (cf. Ricca in press): morphological categories such as tense, aspect and mood for verbs, case and number for nouns, etc., have been excluded from the analysis, even though the caveats hinted at in the preceding section must be kept in mind. Finally, about 60 universals are devoted to word formation proper, which must be again grouped either into categorial universals which relate to a specific word formation category, or into transcategorial ones, if two different (not necessarily both derivational) categories are taken into consideration.

3.1   Structural Universals

Let us start from more general universals relating to morphology as such, in its form – meaning dimension, as in the following one:

#362   The extent of "material" articulation, pertaining in particular to (a) the elaboration of sound systems, (b) the complexity of syllable structures, (c) word length, (d) accentual differentiation (as opposed to not-so-articulated tonal modification), correlates with the extent of "formal" articulation, pertaining in particular to (a) the differentiation of parts of speech, (b) the

elaboration of inflectional and derivational systems, (c) analytic syntax (as opposed to not-so-articulated polysynthesis).

A similar structural dimension is shared by the two following "classical" Greenbergian universals, which describe the relation between inflection and derivation in distributional terms:

#508   If a language has inflection, it always has derivation.

#507   If both the derivation and inflection follow the root, or they both precede the root, the derivation is always between the root and the inflection.

A handful of universals concern conditions on possible morphemes, as for instance the following ones which constrain the distribution of affixation, always implied by less "diagrammatic" techniques, to use a term of Natural Morphology (cf. Dressler 1985):

#505   If a language has discontinuous affixes, it always has either prefixing or suffixing or both.

#1946   The use of all other processes of nominal derivation and inflection (namely internal modification, suprasegmental processes, subtraction, conversion, suppletion), with the exception of total reduplication, implies the use of affixation.

Further conditions define the limits of allomorphy, as in the following case:

#908   Allomorphy cannot be conditioned across (grammatical) word boundaries.

Finally, about ten universals deal with reduplication, which has been the object of several investigations from a typological viewpoint (above all, cf. Moravcsik 1978). This is not surprising given the pretty well defined nature of reduplication as a morphological technique (although much less so as for the range of its derivational meanings), and its limited distribution. Among others, the following two respectively refer to the form and to the content of the reduplication rules:

#663   There is no reduplication pattern that would involve reference to phonological properties other than syllable number, consonantality-vowelhood, and absolute linear position.

#268   If in a language reduplication (full or partial) exists as a productive grammatical means of word- and formbuilding, then, included in the meanings expressed by means of reduplication, we find the meaning "change of quantity or degree".

3.2   Transmorphological Universals

The second group of universals concerns what I call transmorphological relations, namely the relation of morphology with other language components, basically phonology and syntax. The first subset of about 20 universals touches phonology and morphology, and displays the following range of topics, each exemplified by a couple of universals:

- *Conditions on Segmental Structure*

#1963   IF there are consonant clusters CiCj, THEN there are also stems of the form CiVCj.

#1965   IF a phonotactic constraint holds for a syllable-edge, THEN it also holds for a corresponding word edge, but not vice versa.

- *Conditions on Suprasegmental Structure*

#374   There is a positive correlation between higher syllable-per-sentence and syllable-per-word ratios, simpler (or shorter) syllables, agglutinative morphology, and (S)OV basic word order on the one hand and between lower syllable-per-sentence and syllable-per-word ratios, more complex (or longer) syllables, flective (or no) morphology, and (S)V(S)O basic word order on the other.

#713   IF morphology is agglutinative, THEN there is vowel harmony. IF morphology is flexive, THEN there is stress accent.

- *Conditions on Stress*

#711   IF morphology is agglutinative, THEN (stress) accent will be demarcating, falling on word edges (either on initial or final syllables), rather than be free and centralizing, and there consequently will not be much phonological reduction of initial or final syllables.

#1964   If a language has the basic word-form stem+suffix, the accent will fall on a non-final syllable. If a language has the basic word-form that coincides with the stem, the accent will fall on the final syllable.

Among the about fifteen transcategorial universals relating to morphology and syntax, a large majority regards the connection between morphological properties and the basic word order, as in the "classical" Greenbergian universal:

#506   If a language is exclusively suffixing, it is postpositional; if it is exclusively prefixing, it is prepositional.

Other morphosyntactic universals are related to verb argument structure (cf. #608), and there is also a morpho-lexicological universal as #1201:

#608   If a language has a derivational morpheme whose distributional characterization makes reference to objects, it will also make reference to intransitive subjects but not to transitive one.

#1201   IF a language is (more or less) analytic, THEN it has a (more or less) regular phraseological system.

3.3   Categorial Universals

The last relevant group of universals deals with single derivation categories or types. I use the term "category" in a rather broad sense here, meaning both what some linguist would call supercategory (for instance, evaluation, comprising both diminutives and augmentatives), and single instantiations of categories such as causatives and reflexives, which could be theoretically subsumed under a supercategory "valence-changing operations". They are quite limited in number, and can be subdivided into a first subset of intracategorial universals, which comprises the following categories illustrated in the usual way:

• *Causatives*

#1583   If there are causative affixes in a language which serve to form causative verbs from transitives, then this language also has causative affixes which serve to form causative verbs from intransitives.

• *Numerals*

#536   When a number is expressed by subtraction, or when a subtraction occurs as a constituent of a complex expression, the subtrahend is never larger than the remainder.

• *Honorifics*

#657   Honorific affixes to pronouns are more common than pejorative ones; if a language has pejorative pronominal affixes, it also has honorific ones.

• *Reflexives*

#1579   If there are any reflexive verb derived from intransitives by adding reflexive marker and an affix (or a predicative adjective, etc.), a great number of them is likely to imply intensity of action and resultant state.

• *Evaluatives*

#1932   There is an apparently universal iconic tendency in diminutives and augmentatives: diminutives tend to contain high front vowels, whereas augmentatives tend to contain high back vowels.

A second subset of transcategorial universals connects two different derivational categories as in the following cases where participles and deverbal nouns, or reflexives and causatives are put into relation:

#396   If a language has a morphological means to indicate verbal modification (i.e., if a language has participles), then it has a morphological means to indicate verbal reference (i.e., a language has nominalized verb forms).

#1582   If both reflexive marker and the causative marker in a language are affixes, both are: (a) either prefixes (cf. Abkhaz, Amharic, Klamath), or (b) suffixes (Yakut, Kechua, Aymara) or (c) reflexive marker is a prefix and the causative marker is a suffix (cf. Georgian, Ainu, Nivkh, Luganda, Shoshone); it is unlikely for the reflexive marker to be a suffix and the causative marker, a prefix.

The quantitative extension of the universals is, however, strongly different for the single categories. The most represented category are numerals, both because of the substantial investigation by Greenberg (1978), and because of their "paradigmatic" nature, which makes them a less prototypical instance of word formation. Similarly, the comparatively high number of universals relating to causatives is partly due to the study of Nedjalkov & Sil'nickij (1973), and partly to the fact they are often expressed by means of inflectional techniques. Recapitulating all data in the following table, the result for the other categories is rather miserable:

(3)

Categories	*Universals*
Numerals	45
Causatives	12
Reflexives	4
Evaluatives	2
Honorifics	1
Nominalizations	1
Tot.	65

These figures make it evident, that word formation is almost an unexplored continent for typology. In what respect this may be done must be verified with the help of specific investigations, which will take into consideration in a systematic way the derivational categories, the techniques employed to express them, and the possible connections with other properties of grammar.

4.   Substantial and Formal Universals

Besides these substantial universals, which inductively result from investigations on more or less balanced language samples, within theoretical morphology several proposals of universal generalizations are current, which pertain to the shape of grammar, such as for instance Aronoff's Unitary Base Hypothesis. The compatibility of these latter universals with the traditional typological approach outlined above is not

straightforward, if only because they are not of a merely descriptive character, but presuppose a certain theoretical model including a number of (theory-dependent) constructs. For instance, the Unitary Base Hypothesis crucially relies on a clearcut notion of word class. However, it is not excluded that such "formal" universals might be of interest from a typological point of view, also because the latter perspective is often faced with similar definitory problems as discussed in § 2 above. With respect to "formal" universals, in my view it is possible to identify (at least) three types. The first type can be labeled as constraints on the form of the grammar, in other words as universal conditions modeling the grammar of a single language, and is exemplified by the Lexical Integrity Principle (cf. among others Bresnan & Mchombo 1995, and Gaeta 2003) or by the following more specific condition (cf. Menn & MacWhinney 1984):

(4) Repeated Morph Constraint: *XY, where X and Y are adjacent surface strings such that both could be interpreted as manifesting the same underlying morpheme through regular phonological rules, and where either (a) X and Y are both affixes, or (b) either X or Y is an affix, and the other is a (proper subpart of a) stem.

This condition can be seen in action for instance in Italian to exclude that verb stems ending with an affricate be further derived by suffixes containing affricates, as in the following verbs:
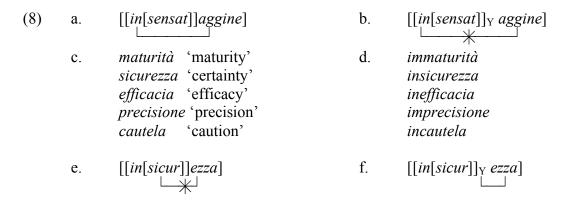
(5) $*[[...\text{ts}V]_V$ *-zione*$]_N$ *avvizzi-re* 'to wither' → **avvizzizione*

  tappezza-re 'to paper' → **tappezzazione*

  $*[[...\text{ʤ}V]_V$ *-aggio*$]_N$ *arrangia-re* 'to arrange' → **arrangiaggio*

  scheggia-re 'to splinter' → **scheggiaggio*

Formal universals of this kind have good chances of holding as general (only restrictive?) conditions for morphology, and therefore of being put on a pair with the substantial universals providing a picture of the types of possible complex morphemes throughout the world languages. A second type of formal universals is more specific since it pertains to the form of morphological rules, which as such crucially relies on the theoretical model adopted. For instance, the following conditions are both claimed to be universal, although giving opposite predictions:

(6) Adjacency Condition: No WFR can involve X and Y, unless Y is uniquely contained in the cycle adjacent to X. (Siegel 1978, Allen 1979)

(7) Atom Condition: A restriction on the attachment of af_x to Y can only refer to features realized on Y. (Williams 1981)

Both conditions involve a number of notions (such as for instance the idea of a derivational cycle or of percolation) which are related to a certain model of grammar. Moreover, they claim the morphology to function in a certain way, and accordingly make precise predictions on how complex morphemes should be. For instance, the Adjacency Condition claims that an affix may only have access to features realized on the previous derivational cycle. Accordingly, it correctly predicts that the Italian suffix

-aggine only selects adjectives bearing a negative semantics, which is provided by the prefix *in-* in the base *insensato* 'senseless':[2]

(8)　　a.　　$[[in[sensat]]aggine]$　　　　b.　　$[[in[sensat]]_Y\ aggine]$

　　　c.　　*maturità* 'maturity'　　　d.　　*immaturità*
　　　　　sicurezza 'certainty'　　　　　*insicurezza*
　　　　　efficacia 'efficacy'　　　　　*inefficacia*
　　　　　precisione 'precision'　　　　*imprecisione*
　　　　　cautela　 'caution'　　　　　*incautela*

　　　e.　　$[[in[sicur]]ezza]$　　　　　f.　　$[[in[sicur]]_Y\ ezza]$

On the contrary, the Atom Condition is not able to predict the correct form, because the suffix may only have access to the lexical head, onto which the negative semantics of the prefix cannot percolate in Italian as shown in (8b), because prefixes are not heads. On the other hand, the Atom Condition correctly predicts that prefixed adjectives as in (8d) select the same suffixes as their bases in (8c), whereas the Adjacency Condition cannot express this regularity, because of the blocking effect of the intervening derivational cycle as shown in (8e). As can be seen, both conditions present shortcomings in accordance with the set of examples considered. Because of this restricted validity, and for the reasons mentioned above, this second type of universals related to the rule format cannot in my opinion be easily generalized about. Even more idiosyncratic, in the sense of theory-internal, is the third type of formal universals, which is related to the grammar format. One example of this kind of universals is in my opinion the Right-Hand Head Rule (cf. Williams 1981), which assigns only to suffixes the property of being heads, and accordingly of inducing feature percolation. Notice that this property is the basis for the Atom Condition seen above. Similarly theory-internal is the so-called Mirror-Principle of Baker (1985):

(9)　　Mirror-Principle: The order of morphological operations, as revealed by the order of affixation, is always identical to that of syntactic operations.

The empirical testability of this kind of universals is highly problematic (cf. Carstairs-McCarthy 1992: 119–130 for a discussion), especially because of the high number of abstract levels requested, which makes the cross-linguistic comparison difficult (and in several cases vacuous).

Independently of the nature and the validity of the single theoretical constructs, the conditions that in my view allow formal universals to be put together with substantial universals are firstly the extent to which they are able to predict a large amount of data, i.e. they grasp universal tendencies. This is in my opinion the case for the notion head, even though with all possible caveats (see in this respect Bauer 1990 and Haspelmath 1992). Second, and more importantly, they should not be theory-

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[2] Notice that, accordingly, **sensataggine* does not occur, and the positive base *sensato* 'sensible' selects *-ezza*: *sensatezza* 'good sense'.

internal in the sense of requiring theoretical constructs which cannot be exported cross-linguistically.

5. Conclusion

To sum up, I hope to have made clear what is already shared knowledge among typologists as to which universal generalizations occur for morphology and in particular word formation. The result is rather miserable: no homogeneous picture either regarding the derivational categories investigated or the morphological techniques involved seems to emerge. On the other hand, an approach based on formal properties of derivational morphology has produced till now few concrete results to be used as guidelines for typological (or even only theoretical) research in a satisfactory way. This does not mean, however, that word formation should not be seen as an adequate research field to explore. On the contrary, my conviction is that also the latter should become a main research object for typological research on a well-balanced language sample. And this both from an achronic perspective, such as the one proper of typology, and from a diachronic viewpoint of "system ontogenesis", as in the perspective adopted by grammaticalization theory.

As a final word, let me end by quoting Anderson (1992: 335), and fully subscribe to his programmatic point of view:

> "[T]here is no substantial difference between typology and theory when correctly viewed. Of course, if it turns out that the correct descriptive framwork admits of only a very few dimensions of variation for languages, with few possible values on each, some will say that we have discovered a typological framework while others will say that we have found the right set of parameters for Universal Grammar. There is no reason to think that what would make the one set happy should not make the others happy too".

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