Why is there morphology?

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Is morphology a necessary feature of human language? How did morphology came into existence? Why does morphology still remain? ...

1. Morphology versus syntax

Languages with rich morphology and those without morphology

- Morphology and syntax can in principle do the same job, so that one of them seems superfluous. Some languages nearly lack morphology (isolating languages such as Vietnamese), while others nearly lack syntax (polysynthetic languages such as Yimas of New Guinea, Nivkh of Siberia, or Greenlandic). Isolating and polysynthetic are nearly incommensurable types. It is rather difficult to characterize the sort of language from which both could have developed.
- Bickerton 1981 (and later) claims that Creole languages, created under the influence of poor input from a pidgin, show most clearly the influence of UG. Klein & Perdue 1997 assume that UG is involved in the Basic Variety created by foreign workers in Europe, which has a poor syntax and no morphology. These authors believe that linguistic compositionality started with simple syntax.
- Polysynthesis is centered around the concept of head-marking, including noun incorporation and verb serialization, and also involves bound morphemes with adverbial or attributive functions. Mattissen 2004 distinguishes two types of internal organization: templatic or scope-ordered, and various sorts of fusion of independent chains. Polysynthesis itself seems to be a late product of repeated grammaticalizations.

  Templatic: The verb form offers a fixed number of slots for different elements which are fixed in their position and their order relative to each other: e.g. in Navaho [Athabascan] or Ket [Yeniseian].

  Scope-ordered: The verb form is not restricted in its complexity and length. The components are fixed in their relative scope, so that they can be ordered according to the intended meaning. Greenlandic is a good example of this organizational type: only the initial (root) and the final (person & mood inflection, enclitics) positions are fixed.
- In general, head-marking languages have rich morphology but quite simple syntax. An inflected verb already represents a full clause. Independent nouns or NPs serve for more explicit referential specification; they have the status of free adjuncts.

Advantages and disadvantages of morphology in comparison to syntax

- A morphological complex is less flexible than a syntactic combination. It is characterized by fixed positions (except some forms of polysynthesis), and no dislocation of elements, no agreement between elements, and no assigment of focus or topic takes place. (M. has a smaller grammatical space – a possible disadvantage)
- A morphological complex is affected by more phonological rules, and thus susceptible to more irregularities, than a syntactic combination. (M. needs large memory load – a possible disadvantage)
- A memorized morphological complex is more rapidly processed than a syntactic combination. (M. allows high processing speed – an advantage)
- Morphology is more difficult to acquire by adult learners than syntax. (M. constitutes learning barriers – a disadvantage)

- Morphology is more diverse than syntax. Morphophonology seems to be the most diverse area of language, with the greatest number of curiosities. (Rich typology)

Morphology-syntax interaction has a number of facets. Let me briefly consider two of them.

- Morphology precedes syntax in the derivation: In the Philippine type languages, the choice of argument encoded on the verb must be prior to the selection of case. Whatever argument is marked by the voice on the verb it must be nominative in the syntax (1), but if no argument is marked on the verb nominative is blocked (2).

(1) Voices in Tagalog (Foley & Van Valin 1984:135)
< ... > characterizes infixation into a stem (here: *bili* 'buy')

a. B<um>ili ang=lalake ng=isda ng=pera sa=tindahan.
<PERF.AV>buy NOM=man GEN=fish GEN=money LOC=store
'*The man* bought fish in the store with money.' (Agent)

b. B<in>ili ng=lalakea ng=isda ng=pera sa=tindahan.
<PERF.OV>buy GEN=man NOM=fish GEN=money LOC=store
'The man bought *the fish* in the store with money.' (Object)

c. B<in>ilh-an ng=lalake ng=isda ng=pera ang=tindahan.
<PERF>buy-LV GEN=man GEN=fish GEN=money NOM=store
'The man bought fish *in the store* with money.' (Location or 'Dative')

d. I-b<in>ili ng=lalake ng=isda ang=bata.
BV-<PERF>buy GEN=man GEN=fish NOM=child
'The man bought fish *for the child*.' (Beneficiary)

e. Ip<in>an-bili ng=lalake ng=isda ang=pera sa=tindahan.
<PERF>IV-buy GEN=man GEN=fish NOM=money LOC=store
'The man bought fish in the store *with the money*.' (Instrument)

(2) Recent perfect in Tagalog (Kroeger 1993:53)
Ka-kakain lamang ng=bata ng=mangga.
REC.PERF-RED.eat only GEN=child GEN=mango
'The child has just eaten a/the mango.'

- But sometimes syntax precedes morphology: In Hindi, the choice of agreement on the verb must follow the selection of case, which depends on sortal properties of argument fillers. The verb agrees with the highest argument being nominative: if the subject is nominative it agrees with the subject (3a,b), if only the object is nominative it agrees with the object (3c), and if none of them is nominative, the verb bears the default marking masc.sing. (3d).

(3) The four-way case split of Hindi (Mohanan 1994)

a. niinaa baalikaa-ko ut^{h}aa-eg-ii. (agreement with subject)
Nina.F.NOM girl-ACC lift-FUT-F
'Nina will lift up a/the girl.'

b. niinaa kelaa khaa-eg-ii. (agreement with subject)
Nina.F.NOM banana.M.NOM eat-FUT-F
'Nina will eat a banana.'

c. niinaa-ne roTii khaa-y-ii. (agreement with object)
Nina.F-ERG bread.F.NOM eat-PERF-F
'Nina ate bread.'

d. niinaa-ne baalikaa-ko ut^{h}aa-y-aa. (no agreement)
Nina.F-ERG girl-ACC lift-PERF-M
'Nina lifted up a/the girl.'

2. Two views on the origin of morphology (or are there two types of morphology?)

- Morphology originates from syntax
- Morphology developed independent of syntax

Morphology originates from syntax (the most common view).

Certain elements in fixed positions become reduced and cannot receive stress; they cliticize at a host and are finally reanalyzed as affixes.

Where this view seems to be appropriate:

- Dependent marking presupposes the existence of a syntactic head-complement distinction, so that the role of an argument can be marked on the complement rather than the head. Morphological case can emerge through reinterpretation of adpositions or serial verbs.
- Similar things are true for agreement morphology, which presupposes at least two syntactic elements in order to get implemented. For instance, arguments can be doubled by pronominal clitics, which later develop to affixes.
- Certain kinds of head marking emerge along similar ways. For instance, TAM affixes on the verb can develop through reanalysis of free auxiliaries.

Where this view seems to be inappropriate: There are certain kinds of morphology for which a syntactic origin is dubious.

- On the phonological side: Nonconcatenative phonological exponents such as ablaut, reduplication, vowel harmony, umlaut, and CV templates with varying numbers of V and C slots (in the semitic roots) are unlikely to have developed through agglutinization. (Anderson 1992 argued perhaps rightly against exclusive concatenative models of morphology!)
- On the categorial side: There are voice categories which necessarily mark the verbal head and for which an independent syntactic origin is hard to conceive of: transitivity affixes, marking whether a predicate is intransitive or transitive; basic voices such as active vs. middle, marking whether a predicate is used prototypically active or not (Klaiman 1991); basic voices such as direct vs. inverse, marking how a transitive verb with animate object is aligned with a person scale (Wunderlich 2005).
- How could a syntactic origin have finally produced the polysynthetic type of language?

Morphology emerged independent of syntax

- Homo sapiens appeared about 180,000 years ago. For the same time (160 - 200,000 years ago) the FOXP2 mutation, probably the most recent change of the genotype affecting human language, has been dated (Lai at al. 2001, Enard et al. 2002a,b).
- Improved control of the vocal apparatus enabled the ***vocal-auditory modality*** to take priority over the gestural-visual modality. PROTOSIGN (probably the dominant system of communication for homo erectus) was gradually relieved by PROTOSPEECH.
- As shown by simulation programs, automatic self-organization through random interactions among speakers-hearers forces (within hundreds or thousands of generations) *discreteness* of articulatory features and *duality of patterning* (minimal units do not bear meaning) (Studdert-Kennedy 2005, Oudeyer 2005). All more complex combinations inherit discreteness from the minimal units.
- Random fluctuations in the process of organizing articulatory features (and, based on that, organizing the vocabulary and its combinatorics) produced linguistic variation

from the very beginning, long before the migration phase began (60,000 years ago). Of course, groups that have separated also undergo separate changes.

- **Early morphology** could have started with a reinterpretation of allomorphic alternations produced by rapid speech, concerning both the nucleus and the periphery (Carstairs-McCarthy 2005). If that is true, some sort of morphology (i) is as old as spoken language itself, (ii) was subject of variation from the beginning, in addition to variations in the inventories of articulatory features and the vocabularies.

Early combinatorics (morpho-syntax)

In all sorts of combinations, some basic asymmetry is at work: one element functions as the head, defining the behaviour within a greater complex, whereas all others are non-heads.

- A vowel is the head of a syllable, and a stressed syllable is the head of a prosodic word.
- Complex predicates such as compounds and adjunction structures have one element as the head.
- The lexical inventory is partitioned into two complementary categorial types, verbs and nouns, with the verb as the head of a clause.
- The information of lexical elements is asymmetric, so that the arguments are strictly ordered, with the lower argument functioning as the 'goal' of predication (nearer to the verb).
- The element in focus is the head of a piece of discourse.

(Categorial Grammar ≈ *external merge*): argument requirements of the combined items are either saturated or inherited to the result, and the information of modifiers is checked for whether it is compatible with what they modify

How did the morphology-syntax competition come about?

3. The development of large human societies

- Up to the last glacial period, linguistic communities were quite small and isolated groups of hunter-gatherers; with a size between 50 and 1,000 individuals. More people couldn't find their living in an area of several hundreds square miles, unless the circumstances were extremely favourable. Seasonal trading between such groups probably existed, but did not give the opportunity to much contact.
- At the end of the ice age 12,000 years ago the living conditions improved, the size of communities increased, the gatherers settled, and agriculture (and subsequently animal domestication) was invented at various places around the world, which enabled both constant access to highly nutritious food and shorter distances between births. This lead to rapid increase of population (by the factor 50 to 1000), and thus forced new societal forms of food storing and distribution, conflict management, as well as technical developments.
- Agriculture emerged about 500 years after the first settlements, 2,000 to 3,000 years later large stratified societies developed (except in New Guinea and Sahel Zone for geographical and climatic circumstances): Near East 8,500/ 5,500 B.C., China 7,500/ 4,000 B.C., New Guinea 7,000/-, Sahel Zone 5,000/-, tropical West Africa 3,000 B.C./ 500 A.D., Middle America 3,500/ 1,500 B.C., tropical South America 3,500/ 1,500, Eastern North America 2,500/ 200 B.C.

There were two different sociographic reactions on the increase of population.

- *In the centres of neolithic transition* (except New Guinea): Increasing groups organized internally, associated with neighbouring people to form larger tribes, kingdoms or states: intensification of techniques, development of cities, bureaucracy, script. Neighbouring people took over agriculture, domestic animals, and metal tools. Language families influenced by the higher degree of population density: Afro-Asiatic (Near East); Sino-Tibetic (China); Aztecan, Mayan, Quechua (America).
- *At the periphery*: Increasing groups looked for new territories, spread and often displaced former groups. Language families due to expansion: Indo-European 4,000 B.C. (north of Near East), Austronesian (south of China) 3,000 B.C., Niger-Congo (Bantu) 3,000 B.C., Altai (Mongolic, Turkic, north of China) 500 B.C.

Studies investigating the relationship between geographic-cultural and linguistic factors

- Nichols (1992) found correlations between head-marking and residual zones.
  - **spread zones** (where languages or language families rapidly spread, serving as lingua franca, and consequent languages succeeded, and in which little genetic and low structural diversity is found)
  - **residual zones** (often at the periphery of spread zones, with high genetic and high structural diversity, and no lingua franca besides local bilingualism).
- Dahl (2006) distinguishes
  - **farmer zone** ("comprising languages traditionally spoken in areas with fully established agriculture")
  - **hunter zone** ("comprising languages traditionally spoken in areas not fully affected by the Neolithic transition"), Languages of the hunter zone show more "free" word order, less VO order, more morphological complexities, and do not include isolating languages.
  - Language density is nearly the same for all macro-regions (except N Guinea), whereas speaker density is much higher in the Old World than in the New World. 1 speaker/sq.km means that a group of 1,000 people occupies a region of 32 kms at each side, so that external contacts must be rare.

(4) Language and speaker density (Dahl 2006)

Macro-area	languages in area	million speakers	speakers/ language	million sq.kms	languages/ mill. sq.km	speakers/ sq.km
Europe	240	1500	6,25 mill.	10	24	**151**
Asia	2000	3500	1,75 mill.	45	44	**77.4**
Africa	2100	675	0,32 mill.	30	70	**22.5**
New Guinea	1200	7	5,800	0.75	1,600	9.3
Oceania	260	1	3,800	-		
North America	600	20	33,000	24	25	**0.8**
South America	400	20	20,000	18	22	**1.1**
Australia	230	0.05	220	7.5	30	**0.005**

- Trudgill 2004: Societal types determine aspects of linguistic structure.
  "*Small, isolated, low-contact communities with tight social network structures* (i) will have large amounts of shared information in common and will therefore able to tolerate lower degrees of linguistic redundancy of certain types [...], (ii) are more likely to be able [...] to ensure the transmission of linguistic complexity from one generation to another. Such communities are thus likely to be more linguistically conservative, i.e., to show a slower rate of linguistic change, and more likely to demonstrate complexities and irregularities. [...]"

„*Communities involved in large amounts of language contact*, to the extent that this is contact between adolescents and adults who are beyond the critical threshold for language acquisition, are likely to demonstrate linguistic pidginisation, including simplification, as a result of imperfect language learning." (Trudgill 2004: 306)

Irregular and non-transparent forms cause problems of memory load for adult learners. Their mode of imperfect learning leads to regularisation of irregularities, to an increase in transparency, and to an increase in analytic over synthetic structures.

Trudgill mainly considers phonological phenomena, however, it becomes obvious from his argumentation that small isolated communities favour morphology rather than syntax. Moreover, isolated languages with few speakers are more likely to be conservative than those with many contacts and many speakers. Therefore, rich morphology systems could survive in the small languages until today even if these systems under different circumstances are inferior to syntax.

4. Some linguistic effects of the neolithic transition

- Speakers of a small community have large amounts of shared information, including memorized linguistic forms, which can rapidly be processed in repeated as well as ritual encounters.
- A change towards (more) syntax happens if the community is growing and partitioned into various specialized or areally separated groups, less information is shared, the social networks become more pervious, and the probability of external contacts increases. → Linguistic communication becomes more varied.
- More varied interaction settings force the participants
  - to use more specifications by independent NPs
  - to be more explicit regarding topic and focus
  - to use more transparent combinations rather than memorized forms
  - to use forms that are less prone to irregularities

  so that the input for the respective next learner generation gets modified.
- A spreading population experiences more external language contacts. Adults using the dominating language as a lingua franca produce more simplified and at the same time more transparent varieties, which accelerates the process of language change.
- Competition between independent demands forces the emergence of positional variants (i.e., dislocation). For instance, the requirement of realizing grammatical functions positionally (S > O) and the requirement of realizing discourse functions positionally (topic > focus) can lead to various orderings such as SVO, $O_{top}SV$ and $O_{top}VS_{foc}$.
- SVO order also facilitates serial verbs, which share arguments ($SV_1OV_2(O_2)$). Then, reinterpretation of one of the verbs as a preposition or case marker is possible.

Something of this might have happened to the previous languages with rich head-marking morphology.

Hypothesis:

Syntax (in the sense that it enables flexible ordering by dislocation of elements, and that it displays particular positions for topic and focus, and eventually dependent marking such as morphological case) is a product of cultural evolution (that is, of iterated learning under the influence of cultural factors). Syntax is favoured in a linguistic community with high variation of interaction settings.

Many small languages with rich morphology remained, so that the linguistic diversity found today partly originates from more recent changes, and partly preserves elder stages. These different origins explain why such incommensurable types such as the polysynthetic and the isolating ones exist side by side. The present coexistence of dislocating syntax and head-marking morphology opens the window to different time depths.

5. Conclusion

As far as morphology developed in a stage of human history in which dislocation syntax was absent it is inappropriate to model these old types of morphology in the light of the more recent dislocation syntax (purely concatenative models, head movement, distributed morphology).

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