Monosyllabism from a systemic typological perspective

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Overview

• Some general remarks on
  • monosyllabism and typology
  • systemic typology

• Results of a previous study
  positive cross-linguistic correlations between the number of monosyllabic words, the number of syllable types, syllable complexity, and phonemic inventory size

• Results of a new study using
  – an extended sample of languages including also non-Indo-European languages, and
  – a different method, i.e., texts instead of statistical language descriptions

• Monosyllabism from a systemic typological perspective
Monosyllabism and typology

- Monosyllabism has since long been considered a typologically relevant parameter: monosyllabic or isolating languages vs. polysyllabic or inflectional languages.
Monosyllabism and typology

Two conflicting assumptions concerning the development of language

• **Schleicher** (e.g. 1873):
  Development of language from monosyllabic formless roots through an agglutinating stage to the “highest” stage found in flexional languages.

• **Jespersen**:
  “The evolution of language shows a progressive tendency from inseparable irregular conglomerations to freely and regularly combinable elements.” (1894: 127)
Monosyllabism and systemic typology

Monosyllabism is a gradual phenomenon and clear-cut classifications are not possible.

Objective of this paper is to investigate

• to what extent languages differ in regard to their proportion of monosyllabic words and

• which additional properties could be associated with monosyllabism: e.g.
  – high syllable complexity
  – high proportion of homophony
  – high number of idioms
  – stress-timed rhythm
Systemic Typology

- Systematic interactions between the subsystems of language
- Self-regulating processes optimizing the interaction between its subsystems and the interaction with the articulatory and cognitive system.
Systemic Typology: results of a previous study

- In cross-linguistic comparison (34 languages) the mean number of syllables per clause was found to be located almost exactly in the range of Miller’s 7 plus minus 2 elements: The lowest size was a mean of 5.05 syllables (Dutch), and only Japanese with 10.2 syllables per clause was located outside the hypothesized range of 5-9 syllables.

- The mean number of words was about 4, ranging from 2.5 in Arabic to 4.4 in English (→ Cowan’s number 4 plus minus 1)

(Fenk-Oczlon & Fenk 1999)
The mean number of syllables per clause in 34 languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Mean Number</th>
</tr>
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<tbody>
<tr>
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<td>Chiqu.</td>
<td>9.14</td>
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<td>Japan.</td>
<td>10.23</td>
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</table>
Systemic typology:

Further crosslinguistic correlations

- The more syllables per word, the fewer phonemes per syllable. $r = -0.54$ (p < 0.1%)
- The more syllables per clause, the more syllables per word. $r = + 0.47$ (p < 1%)
- The more words per clause, the fewer syllables per word. $r = -0.66$ (p < 0.1%)
- High syllable complexity is significantly associated with VO order

Fenk-Oczlon & Fenk 1999
A comparison of two basic typological patterns

low syllable complexity
• high number of syllables per clause and per word
• low number of words per clause
• OV word order
• agglutinative morphology
• high number of cases
• separatist case exponents
• postpositions
• syllable timed

high syllable complexity
• low number of syllables per clause and per word
• high number of words per clause
• VO word order
• fusional, isolating
• low number of cases
• cumulative case exponents
• prepositions
• stress timed

(Fenk-Oczlon & Fenk 2005)
Monosyllabism, phonological and semantic complexity
(Fenk-Oczlon & Fenk 2008)

Starting point was our significant cross-linguistic correlation:
The fewer syllables per word, the more phonemes per syllable.
Therefore ?:
→ languages with a large inventory of monosyllabic words tend to have a high average syllable complexity.

• A high mean number of phonemes per syllable is a presupposition for a high intra-language variability of syllable complexity. (Trivial! Non-trivial is the question to which extent languages make use of their combinatorial possibilities. → constraints of phonotactic possibilities)
Hypotheses

• *Hypothesis I*: The higher a language’s number of syllable types, the higher its number of monosyllabic words.

• *Hypothesis II*: The higher a language’s syllable complexity, the higher its number of syllable types.

• *Hypothesis III*: The higher a language’s syllable complexity, the higher its number of monosyllabic words.

• *Hypothesis IV*: The bigger a language’s phonemic inventory, the higher its syllable complexity.
The language sample

• In order to test these assumptions we collected and calculated relevant data from Menzerath’s (1954) statistical descriptions of eight languages:
  English, German, Romanian, Croatian, Catalan, Portuguese, Spanish, Italian
Table 1

Data collected or calculated from Menzerath’s descriptions of eight different languages.

<table>
<thead>
<tr>
<th></th>
<th>X n of phon. per monosyllable</th>
<th>Y n of syllable types realised in monosyllables</th>
<th>Z n of monosyllables</th>
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</thead>
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<td>X&lt;sub&gt;max&lt;/sub&gt;</td>
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<td>8</td>
<td>Italian</td>
<td>2.452</td>
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</table>
Results

- The more syllable types, the more monosyllabic words. $r = + .895$ ($p < .01$)
- The higher the mean number of phonemes per syllable, the more syllable types. $r = + .76$ ($p < .05$)
- The higher the maximum number of phonemes per syllable, the higher the number of monosyllabic words. $r = + .807$ ($p < .05$)
- The bigger the phonemic inventory, the higher the mean syllable complexity. $r = + .622$ ($p < .1$) (not too far from being significant; showed a positive sign)

cf. Maddieson 2006:110 “there are on average more consonants in the inventories of languages with complex syllable structures than in languages with moderately complex syllable structures and the least in languages with simple syllable structures”
A short excursion into diachrony

A comparison of the Beowulf Prologue in Old English (OE) and its translation into Modern English (ME) shows a remarkable increase of monosyllables and a concomitant increase of the mean syllable complexity in number of phonemes:

<table>
<thead>
<tr>
<th></th>
<th>number of monosyllables</th>
<th>mean syllable complexity</th>
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<tr>
<td>ME</td>
<td>312</td>
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</table>
The new study: An extended sample and a different method

Are such results robust? Can they be reproduced in an extended sample of languages including also non-Indo-European languages and when using a different method, i.e., texts instead of statistical language descriptions?

*Hypotheses regarding cross-linguistic comparisons:*

- The larger the proportion of monosyllables in a text, the higher the mean syllable complexity.
- The larger the proportion of monosyllables in a text, the larger the number of words.
Method

• 37 languages were compared with respect to their proportion of monosyllables in text. The “text” was a controlled set of 22 simple sentences that were translated by native-speakers into their mother tongue.
Language sample

- 17 Indo-European: Armenian, Bulgarian, Croatian, Dutch, English, French, German, Icelandic, Italian, Latvian, Norwegian, Polish, Romanian, Russian, Slovenian, Tajik, Welsh
- 4 Austronesian: Indonesian, Javanese, Karo Batak, Malagasy
- 3 Niger Kongo: Bambara, Kirundi, Yoruba
- 2 Uralic: Hungarian, Finnish
- 1 Turkic: Turkish
- 2 Sino-Tibetan: Mandarin, Cantonese
- 1 Austroasiatic: Vietnamese
- 1 Kartvelian: Georgian
- 1 Tai-Kadai: Thai
- 1 Dravidian: Telugu
- 1 Uto-Aztecan: Hopi
- Navaho
- 1 Macro-Ge: Chiquitano
- 1 Australian: Marranju
(1) The child is waiting for its meal.
(2) The sun is shining.
(3) Blood is red.
(4) I think of you.
(5) Our neighbour is a farmer.
(6) She trusts her friend.
(7) She sings.
(8) A father looks after his family.
(9) The girl is industrious.
(10) I thank the teacher.
(11) The spring is on the right.
(12) My girlfriend is helping me.
(13) My brother is a hunter.
(14) The water is cold.
(15) The dog is outside.
(16) My father is a fisherman.
(17) Grandfather is sleeping.
(18) A mother loves her son.
(19) Aunty is at home.
(20) My sister is collecting wood.
(21) He is building a hut.
(22) It’s raining.
1. The child is waiting for its meal.

Bocah iku lagi ngentenî panganane
child that/ imperf wait food. his

2. The sun is shining.

Srengengene lagi metu
sun. the imperf come.out

3. Blood is red.

Getih wernane abang
blood colour. the red.
1. The child is waiting for its meal

\[
\text{ Santiago } \quad (\text{sai lou}) \quad (\text{dang gan}) \quad (\text{kui ge}) \quad (\text{si mat}) = 10
\]

The child is waiting for its meal.

2. The sun is shining

\[
\text{ yong } \quad (\text{tai gong}) \quad (\text{mang liek}) \quad = 4
\]

The sun is shining.

3. Blood is red

\[
\text{ huyut } \quad (\text{hai}) \quad (\text{hong ge}) \quad = 4
\]

Blood is red.
1. The child is waiting for its meal

\[
\text{Đưa Trẻ \, chờ bữa cơm.} \\
\text{the child \, progressive wait for \, meal.}
\]

2. The sun is shining

\[
\text{Mặt trời \, chiếu sáng.} \\
\text{sun \, progressive shine.}
\]

3. Blood is red

\[
\text{Màu đỏ.} \\
\text{red}
\]
<table>
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<tr>
<th>Language</th>
<th>words</th>
<th>monosyll</th>
<th>ph/syll</th>
<th>syll/s</th>
<th>% of ms/w</th>
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</table>
Results

• The more monosyllables per “text”, the more phonemes per syllable.
  \[ r = + .62 \quad (p < .001) \]

• The more words per “text”, the more monosyllables.
  \[ r = + .59 \quad (p < .001) \]
Monosyllabism and homophony

• Languages with a high number of monosyllabic words tend to have a higher number of homophones. There are about four times more monosyllabic than polysyllabic homophones (Jespersen 1933):
  “The shorter the word, the more likely is it to find another word of accidentally the same sound.”
Ke (2006) compared English, Dutch and German with regard to their number of monosyllables and degree of homophony:

- English has a much higher proportion of monosyllables (32 %) than Dutch (20 %) and German (14%) in the 5000 most frequent words.
- The correlations between homophony and monosyllables was in all 3 languages very high, i.e., in the region from .96 - .99
Monosyllabism and polysemy

• Because of the well known association between frequency and polysemy on the one hand and frequency and shortness on the other, polysemy should also be more frequent in languages with a high number of short and monosyllabic words.
Emergence of homonymy and polysemy

• **Polysemy**: one word - different meanings semantically related
  emergence: reduction processes, metaphors/metonymies
  – e.g. *aphaeresis*:
    around $\rightarrow$ round (verb, noun, adj, adv, prep)
  – e.g. *clipping*:
    gymnasium, gymnastics $\rightarrow$ gym

• **Homonymy**: one word – different meanings semantically unrelated
  emergence: accidental result of sound merger
  auris, acus $\rightarrow$ ear
  earm, arme $\rightarrow$ arm
Do homophony and polysemy enhance the number of idiomatic and formulaic speech?

Due to context-effects, a language can tolerate a high degree of homophony and polysemy. Therefore the polysemous and homonymous words are often stored and memorized together with (typical) contexts. Frequently used collocations can become formulaic and idiomatic.
English as compared to Russian (Polikarpov 1997)

- **Wordlength**: Russian words are on the average 1.4 times longer than English words.
- **Polysemy**: English words have on the average 2.7 meanings, Russian words only 1.7.
- **Homonyms** in English: at least 2,000
  Homonyms in Russian: ~ 500
- **Idioms** in English: ~ 30,000
  Idioms in Russian: ~ 10,000
English as an example

English has

• a high number of monosyllabic words (roughly 8000 according to Jespersen)
• a high number of homonyms, homophones, as well as a high degree of lexical and grammatical polysemy
• a high number of idioms
  – e.g. phrasal verbs: they are idiomatic, because their meaning cannot be derived from the meaning of each word separately. The verb and the preposition/adverb forming the phrasal verb are often polysemous and MONOSYLLABIC: In an analysis of 1406 phrasal verbs we found that 1367 or 97% were monosyllabic.
Monosyllabicity and stress-timed rhythm?

Hypothesis:
The more monosyllables in a language, the higher its tendency to stress-timed rhythm

• Theoretical considerations:
  – stress-timed rhythm: tendency to complex syllable structure; a high standard deviation of consonantal intervals; a high mean syllable complexity that allows a high variability of syllable size

• Empirical data: Those languages most commonly classified as stress-timed languages show in our sample a high number of monosyllables (> 50)
Conclusion

• Languages differ enormously in their proportion of monosyllables
• The tendency to monosyllabism interacts in systematic ways with other components of the language system:

  Languages with a high number of monosyllables tend to
  – complex syllable structures, a high number of syllable types, and a large segmental inventory
  – a large proportion of homophony, and to a high number of formulaic and idiomatic utterances
  – stress-timed rhythm
  – and, as also known from other studies, to VO-order and low morphological complexity
Selected references


Selected references
