

## PHONEME INVENTORY SIZE AND THE LANGUAGE SYSTEM

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Phoneme inventory size and its relationship with linguistic and non-linguistic factors remains a matter of debate. Especially research reporting correlations between inventory size and non-linguistic factors like population size (Hay & Bauer, 2007) or distance of Africa (Atkinson, 2011) gained a lot of interest. Concerning relationships within the language system Maddieson (2006) and Fenk-Oczlon & Fenk (2008) found a positive correlation between inventory size and syllable complexity; Nettle (1995, 1998) and Wichmann et al. (2011) report an inverse relationship between word length and inventory size. All these studies use single words for their correlations or descriptions of the permitted syllable structures in the respective languages. But the length of uninflected words in dictionaries or word lists or the permitted maximum syllable complexity in individual languages do not reflect word length or syllable size in textual material or actual language use (cf. Maddieson 2009).

*A new study: Cross-linguistic correlations between phoneme inventory size, syllable size, and word length in textual material*

**Hypothesis:** Cross-linguistic correlations between phoneme inventory size, syllable size and word length show also in textual material. **Method:** Parallel texts were obtained by an elicitation experiment: Native speakers of 56 languages from 17 language families were asked to translate a matched set of 22 simple declarative sentences into their mother tongue. We then calculated the average syllable complexity (in number of phonemes) and the average word length (in number of syllables and number of phonemes) in these texts and correlated the data with the size of the language's phoneme inventories found in UPSID and/or the PHOIBLE database. **Results:** • a significant positive correlation between

syllable complexity and phoneme inventory ( $r = .58$ ,  $n = 56$ ,  $p < .01$ ); • a significant negative correlation between word length in number of syllables and phoneme inventory ( $r = -.38$ ,  $n = 56$ ,  $p < .01$ ); • an insignificant negative correlation between phoneme inventory size and number of phonemes per word ( $r = -.14$ ,  $n = 56$ , ns.) **Discussion:** A significant positive correlation between inventory size and syllable complexity as well as a significant negative correlation between inventory size and word length in number of syllables shows also in texts. However, Nettl's and Wichmann et al.'s negative correlation between inventory size and word length in number of phonemes turned out to be insignificant in our textual material. This rather unexpected result will be explained by referring to a cross-linguistic version of Menzerath's law (Fenk-Oczlon & Fenk, 1999).

### Phoneme inventory size: interactions with the language system

The present study demonstrates that phoneme inventory size is strongly correlated with syllable complexity in number of phonemes. Syllable complexity in turn is associated with short words and morphological simplicity, as shown in previous studies (Fenk-Oczlon & Fenk, 1999, 2005; see Tab.1)

Table 1. Associations between syllable complexity, phoneme inventory and other linguistic features

high syllable complexity	low syllable complexity
<b>large phoneme inventory size</b>	<b>small phoneme inventory size</b>
low number of syllables per word	high number of syllables per word
high number of monosyllables	low number of monosyllables
low number of syllables per clause	high number of syllables per clause
low number of morphological cases	high number of morphological cases
cumulative case exponents	separatist case exponents
stress-timed	syllable-timed
prepositions	postpositions
SVO	SOV
isolating or fusional morphology	agglutinative morphology

Note. Adapted from Fenk-Oczlon & Fenk, 2005

Lupyan and Dale (2010) report an inverse relationship between morphological simplicity (fewer cases, isolating, etc.) and population size. The present paper demonstrates an inverse relationship between phoneme inventory size and morphological simplicity (fewer cases, isolating, etc.). If morphological simplicity correlates with both large population size and large phoneme inventory size, then this might be an explanation for Hay and Bauer's (2007) finding that inventory size and population size are positively correlated.

We propose that a systemic approach to phoneme inventory size will advance our understanding of phoneme inventory size evolution and variation.

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