COMPLEXITY TRADE-OFFS IN LANGUAGE DO NOT IMPLY AN EQUAL OVERALL COMPLEXITY[1]

Gertraud Fenk-Oczlon[2]

August Fenk [3]

KEYWORDS

Language Complexity, Complexity Trade-Offs, Equal Overall Complexity, Cross-linguistic Correlations

In the perennial debate whether languages differ in their complexity, quite a number of linguists hold the opinion that all languages are equally complex. This might be inter alia an understandable reaction to 19th century typologists [e.g.1] who classified morphologically less complex languages as inferior and highly inflectional languages "as the pinnacle of linguistic evolution" [2]. But this assessment of "more complex" as a favorable quality was already challenged by Jespersen [3] who considers, using English as an example, less complexity in the inflectional system and a tendency to isolating morphology as a progress in language.

We assume that languages may well differ in their overall complexity. But as long as it is impossible to quantify the overall complexity of a single language it is also impossible to compare different languages with respect to that quantity [4]. And complexity per se is not necessarily valuable: If a language can express what is required with less grammatical or phonological complexity than this could be seen rather an advantage or as more efficient [cf. 5: 268].

We insist that there are complexity trade-offs between subsystems of language, e.g. between word structure and phonological complexity [4, 6] but rebut the very common view that complexity trade-offs between subsystems of language imply or indicate an equal overall

[2] Alpen-Adria University of Klagenfurt, Austria, gertraud.fenk@uni-klu.ac.at
[3] Alpen-Adria University of Klagenfurt, Austria, august.fenk@uni-klu.ac.at

complexity of languages. We will reinforce our arguments against such a view on the occasion of some misinterpretations of our previous studies [e.g. 4, 6]. Although we explicitly stated in [4: 63] that the trade-off we have found between facets of phonological complexity and morphological complexity "by no means supports /…/ the idea of an equal overall complexity in natural languages" it is argued in [7: 86] that Fenk-Oczlon & Fenk answer in [4] to the question whether it is true that all languages are equally complex "in the affirmative". Or in [8] "First of all, I shall argue, following Fenk-Oczlon and Fenk (2008), that the subsystems of any language are governed by complexity trade-offs, which leads us to postulate that all languages are, roughly speaking, equally complex."

Actually, we already have emphasized [4: 54f] that our trade-offs do *not* indicate an equal overall complexity. This was illustrated by a non-linguistic example with only two and easily calculable parameters – the number of printouts and of copies produced by each staff member of a low-budget institute – determining the total "complexity" (e.g. the geometric mean or, for simplicity, the sum of printouts and copies) per individual member. In this example even a very high negative "cross-member" correlation *the more printouts, the fewer copies* does not at all mean that the individual members produce equal sums of printouts plus copies. Though favoring a tendency to the mean of these sums, those trade-offs do not even exclude cases of individual members producing a maximum in both printouts and copies or producing no printouts or copies at all. In language, however, at least the latter case is impossible, and there are further principles enhancing the above-mentioned tendency to the mean, i.e., the tendency to reduce the variation of the overall complexity among languages.

As a linguistic example let us take the significant negative cross-linguistic correlation between the number of phonemes per syllables and the number of syllables per word [6]: The more syllables per word, the fewer phonemes per syllable. This negative correlation can be interpreted as a complexity trade-off between a facet of phonological complexity and a facet of morphological complexity. But it does not at all imply an overall equal complexity. First of all for the general reason that syllable structure and word structure are only two facets out of an unknown number of facets that may contribute to a language's total complexity. More specifically it does not mean equal overall complexity because word length itself is determined by different morphological complexity factors:

A language may tend to agglutinative morphology and to extremely long words with many morphological affixes, or to fusional morphology and somewhat shorter words. Isolating languages that are, from a morphological perspective, less complex, tend to have shorter words and ideally just one grammatical morpheme per word, but can in return have disyllabic or trisyllabic (lexical) word roots.

The trade-off between syllable complexity and word length can also be observed in pidgin languages that are most commonly supposed to be languages with low complexity. Pidgin languages tend to simplify syllable structure and according to [9] the pidgin languages Neo-Melanesian and Chinese Pidgin-English have, as compared with their lexifier language English, a much higher proportion of bisyllabic words. As syllable structures are simplified, the number of syllables per word increases.

Shosted [10: 33] concludes that "the dictum 'All languages are equally complex' is dogmatic. Statements of this sort should be used with greater caution – if not discarded altogether – until such time as falsifiable, quantitative evidence of correlated complexity is brought forward." We agree and are even pessimistic for the remote future:

• The number of cross-linguistic correlations indicating complexity trade-offs may well increase. Such correlations are interesting for our understanding of single natural languages as self-organizing systems.

• Such inferences were untenable even if *all* relevant parameters contributing to complexity were ascertainable, as illustrated in our above example with printouts versus copies. This is rather unpromising in face of language systems: How should we ever know if the list available at a given time is really exhaustive? Anyway: Even in an already identified parameter there is most commonly no undisputed operationalization. And different ways to make that parameter calculable will produce different results.

• The "equal overall complexity"-hypothesis is a 0-hypothesis, i.e., a hypothetical negation of possible complexity-differences depending on the specific language. And a 0-hypothesis cannot be really corroborated; it can only be refuted, and this through a statistical corroboration of "positive" differences.

Our conclusion: Complexity trade-offs between the subsystems of language favor a relatively "constant" flow of information within that language as well as a tendency to the mean of the overall complexity between languages. But they do not at all exclude language-specific differences in that overall complexity.

REFERENCES

1. Schleicher, A. (1850). *Die Sprachen Europas in systematischer Übersicht*. Bonn: H.B. König.

2. McCawley, J. D. (1993). Introduction. In O. Jespersen *Progress in Language: with Special Reference to English.* Amsterdam/Philadelphia: John Benjamins,

3. Jespersen, O. (1894). *Progress in Language: with Special Reference to English.* London: Swan Sonnenschein & Co.

4. Fenk-Oczlon, G., & Fenk, A. (2008). Complexity trade-offs between the subsystems of language. In M. Miestamo, K. Sinnemäki & F. Karlsson (Eds.) *Language Complexity: Typology, Contact, Change.* Amsterdam/Philadelphia: John Benjamins, 43–65.

5. Parkvall, M. (2008). The simplicity of creoles in a cross-linguistic perspective. In M. Miestamo, K. Sinnemäki & F. Karlsson (eds.) *Language Complexity: Typology, Contact, Change.* Amsterdam/Philadelphia: John Benjamins, 265-285.

6. Fenk, A. & Fenk-Oczlon, G. (1993). Menzerath's law and the constant flow of linguistic information. In R. Köhler & B. Rieger (Eds.) *Contributions to Quantitative Linguistics*. Dordrecht: Kluwer Academic Publishers, 11 – 31.

7. Maddieson, I. (2009). Calculating morphological complexity. In F. Pellegrino, E. Marsico, J. Chitoran & C. Coupé (Eds.) *Approaches to Phonological Complexity*. Berlin/New York: Mouton de Gruyter, 85-109.

8. Glaudert, N. (2009). The theory of markedness and foreign language teaching. In A. Shafari & M. Nejati (Eds.) *Annals of Language and Learning. Proceedings of the 2009 International Online conference (IOLC 2009).*

9. Hall, R.A. (1966). *Pidgin and Creole Languages*. Ithaca NY: Cornell University Press.

10. Shosted, R. K. (2006). Correlating complexity: A typological approach. *Linguistic Typology 10-1*, 1-40.