Studies
in Quantitative Linguistics
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The Lambda-structure of Texts

RAM - Verlag

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by

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2011
RAM-Verlag

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Preface

The problem of frequency structuring of a text is not only very old but it has at present a great number of different aspects. The most popular ones are the studies of vocabulary richness, type-token ratio, rank-frequency distributions and the frequency spectrum, to mention only some of them. Vocabulary richness is a central property of the text useful in the study of language learning, in forensic linguistics, in style studies, in the literary development of a writer etc. Many researchers tried to find a relationship between the number of types and that of tokens (text size) but even if sometimes they succeeded to stabilize the relation, in the formula a variable remained whose sampling distribution was not known. What is the expectation of V (vocabulary) and the text size (N)? And even if text size can sometimes be determined in advance (e.g. for a press article), the vocabulary cannot. How can the standard deviation of the vocabulary be derived? The answer has never been given and nobody has tried to solve the problem, not even empirically.

The present study shows that if we descend a level deeper, viz. from the vocabulary as a whole to its components, i.e. words and their frequencies, a stable indicator (called lambda) of frequency structure (*cum grano salis* the basis of vocabulary richness) can be set up which does not depend on text size (*N*) and whose variance can be asymptotically derived. This fact enables us to set up tests for comparing individual texts, individual authors, genres, and languages, to follow the deployment of a text and the evolution of a writer through years. It allows us to study the jumps in the individual chapters/parts of a text and to express quantitatively different aspects of text dynamics.

Needless to say, even if we exemplify the study using 1185 texts in 35 languages, the research is not finished. On the contrary, many more texts must be analyzed, new aspect should be discovered and for every aspect test procedures must be devised. Further, frequency structure is not an isolated property. It is associated with other different properties, but first such a connection must be hypothesized and the other properties must be quantified, too, before we begin to set up hypotheses. It can be conjectured that frequency structure is also an element of Köhler´s control cycle but the way to show it will be very long.

Acknowledgements

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