

FROM MATHEMATICAL INTO APPLIED LINGUISTICS

Martynova A.

Russian State University for Humanities, Faculty of Information Systems and Information Protection, Department of Fundamental and Applied Mathematics,
Russia, 117534, Moscow, Kirovogradskaya Street 25, bldg. 2, Tel. 8(495)250-64-93,
E-mail: xvoltskyfall@gmail.com

Will be exploring linguistic structures through mathematical tools. [1] Relying on the theoretical fundamental bases, invented by Ferdinand de Saussure, we can transform them for applied linguistics' needs with the help of Abstract algebra and other mathematical fields. For example, conjunction, Boolean's algebra tool, can be expressed through following combinations of words: malevolence **and** benevolence (in English) [2], **nicht nur** Böswilligkeit **sondern auch** Gutmütigkeit (in German), **sowohl** Böswilligkeit **als auch** Gutmütigkeit (in German), 악의 **하고** 덕세 (in Korean), 악의 **과** 덕세 (in Korean). And disjunction can be expressed the next way: malevolence **or** benevolence (in English), bene **o** male (in Italian), **entweder** Böswilligkeit **oder** Gutmütigkeit (in German).

Also recursive linguistic structures can be read off by the following formulas: $P = P_n[P_{n-1}]$ or, mostly, by $P = P_n[S, P_{n-1}]$, where S is the number of elements, which doesn't take part in the recursion process. [2]

Also these tools can be use in the description of the sentence formation. [3][4] Will consider linguistic topology as well, where's given an outlook on consistent patterns of different languages, and how and by which features languages can be united into one language group. For instance, it can sound peculiar at first, that Japanese and Turkish language have something in common. But they both do belong to the one same agglutinative language group based on the way words are built.

Thus will explore different methods and theories related to various connections of mathematics and linguistics, which can be used in tremendous number of practical way, starting from formalization of the language and grammar structures to computational linguistics, which is acknowledged to be part of artificial intelligence's science. [5][6]

References

1. *Ferdinand de Saussure*. Course in General Linguistics / edited by Charles Bally and Albert Sechehaye, translated by Wade Baskin – University of Geneva, 1916. 124 pages.
2. *Gladky A. B., Melchuk I. A.* Elements of Mathematical Linguistics. – Moscow, publishing house: Science, 1969. 193 pages.
3. *Zellig S. Harris*. Structural Linguistics. – The Uni of Chicago Press, 1963. 406 pages.
4. *Chomsky N.* Syntactic Structures. – Cambridge, 1957. 115 pages.
5. *Piotrovsky R. G., Bektaev K. B.* Mathematical Linguistics. – Moscow: High School Press, 1977. 383 pages.
6. *Alan Davies and Catherine Elder*. The Handbook of Applied Linguistics. – Blackwell Publishing Ltd, 2004. 886 pages.