

# Initial and final syllables in tatar: From phonotactics to morphology

Galieva A., Vavilova Z.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

## Abstract

The paper proposes a methodology for analyzing the syllabic structure of Tatar words using fiction text data. Syllable construction rules are unique for each language as they are determined by the laws that govern its specific internal structure. However, the issue of the syllable finds a rather superficial description in Tatar grammars. Thus, possible correlations of the syllable structure with morphological features of the language will be examined in this paper. We analyze the distribution of syllable types in Tatar texts and represent their ranked frequencies and theoretical values fitted by means of the Zipf-Mandelbrot distribution. The main part of the study is devoted to inquiry into the structure of initial and final syllables. We proceed from the hypothesis that distributions of syllable structures in word-initial and word-final positions should be marked by statistically important differences due to discriminative structural features of stems and affixal chains. The study is based on a selection of obstruent and sonorant consonants. To evaluate statistical significance of these differences, the well-known  $\chi^2$  test is applied.

---

## Keywords

Phonotactics and morphology, Quantitative linguistics, Syllable, Syllable structure, The Tatar language

## References

- [1] Altmann, E. G., Gerlach, M. (2016). Statistical laws in linguistics. In: Creativity and Universality in Language. Springer, 7-26.
- [2] Antić, G., Kelih, E., Grzybek, P. (2007). Zero-syllable words in determining word length. Contributions to the science of text and language. In: Word Length Studies and Related Issues. Springer, 117 - 156.
- [3] Aşlıyan, R., Günel, K. (2005). Design and implementation for extracting Turkish syllables and analyzing Turkish syllables. In: International Symposium on Innovations in Intelligent SysTems and Applications. INISTA, 170-173.
- [4] Conover, W. J. (1999). Practical Nonparametric Statistics (3rd ed.). New York: Wiley.
- [5] Davis, S. (1988). Topics in syllable geometry. New York: Garland.
- [6] Davis, S. (2006). Syllable constituents. In: The Encyclopedia of Language and Linguistics (2nd ed.). Vol. 12. Oxford & New York: Pergamon Press, 326-328.
- [7] Fenk, A., Fenk-Oczlon, G., Fenk, L. (2006) Syllable complexity as a function of word complexity. In The VIII International Conference Cognitive Modeling in Linguistics. Vol. 1, 324-333.
- [8] Féry, C. & Vijver van de, R. (eds.) (2003). The Syllable in Optimality Theory. Cambridge: Cambridge University Press.

- [9] Galieva, A. M. (2018). Synonymy in modern Tatar reflected by the Tatar-Russian Socio-Political Thesaurus. In: Čibej, J. et al. (eds.), Proceedings of the XVIII EURALEX International Congress: Lexicography in Global Contexts. Ljubljana, 585-994.
- [10] Galieva, A. M. (2020). Struktura sloga v tatarskom yazyke: ot dannykh k modeli [Syllable structure in Tatar: from data to modeling]. International Journal of Open Information Technologies 8 (1), 9-16.
- [11] Grzybek, P. (2007) History and methodology of word length studies. In: Contributions to the Science of Text and Language. Word Length Studies and Related Issues. Springer, 15-90.
- [12] Guzev, V. G., Burykin, A. A. (2007) Obshchie stroevye osobennosti agglutinativnykh yazykov [General structural peculiarities of agglutinative languages]. In: Acta Linguistica Petropolitana. Trudy Instituta lingvisticheskikh issledovanii [Papers of Institute of Linguistic Studies, Russian Academy of Sciences]. Vol. 3-1. Saint-Petersburg: Nestor-istoriya, 109-117.
- [13] Haugen, E. (1956). The syllable in linguistic description. In: M. Halle, H. Lunt, & H. McLean (eds.) For Roman Jakobson. The Hague: Mouton, 213-221.
- [14] Hulst van der, H., Ritter, N. A. (1999). The Syllable: Views and Facts. Berlin: Mouton de Gruyter.
- [15] Khisamova, F. M. (ed.) (2015). Tatar grammatikası [Tatar Grammar]. Vol. 1. Kazan: Institute of Language, Literature and Art.
- [16] Knyazev, S. V. (2006). Struktura foneticheskogo slova v russkom yazyke: sinkroniya i diakhroniya [Structure of the Phonetic Word in Russian: Synchrony and Diachrony]. Moscow: Max Press.
- [17] Kodzasov, S. V., Muravyova, I. A. (1980). Slog i ritmika slova v alyutorskom yazyke [Syllable and word rhythmics in Alutor]. In: Publikatsii otdeleniya strukturnoi i prikladnoi lingvistiki MGU. Filologicheskii fakultet [Papers of Department of Structural and Applied Linguistics of Moscow State University]. No. 9. Moscow: Lomonosov Moscow State University Press, 103-127.
- [18] Mandelbrot, B. B. (1965). Information Theory and Psycholinguistics. In: B. B. Wolman & E. Nagel (eds.) Scientific Psychology. New York: Basic Books, 550-562.
- [19] Moroz, G. A. (2019). Slogovaya struktura adygeyskogo yazyka: ot dannykh k obobshcheniyam [Adyghe syllable structure: from empirical data to generalizations]. Voprosy yazykoznanija [Issues of Linguistics] 2, 82-95.
- [20] Prince, A., Smolensky, P. (1993). Optimality Theory: Constraint Interaction in Generative Grammar. Technical Report CU-CS-696-93, Department of Computer Science, University of Colorado at Boulder. Available from <http://roa.rutgers.edu/files/537-0802/537-0802-PRINCE-0-0.PDF>
- [21] R Core Team (2018). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing. Vienna, Austria. Available from <https://www.R-project.org/>.
- [22] Radojičić, M., Lazić, B., Kaplar, S., Stanković, R., Obradović, I., Mačutek, J., Leššová, L. (2019). Frequency and length of syllables in Serbian. Glottometrics 45, 114-123.
- [23] Russo, D. (2015; ed.). The Notion of Syllable across History, Theories and Analysis. Cambridge: Cambridge Scholars Publishing.
- [24] Vserossijskaya perepis naseleniya [All-Russian Census] (2010). Available from [https://rosstat.gov.ru/free\\_doc/new\\_site/perepis2010/croc/perepis\\_itogi1612.htm](https://rosstat.gov.ru/free_doc/new_site/perepis2010/croc/perepis_itogi1612.htm)
- [25] Wickham, H. (2017). tidyverse: Easily Install and Load the 'Tidyverse'. R package version 1.2.1. Available from <https://CRAN.R-project.org/package=tidyverse>
- [26] Wickham, H. (2019). stringr: Simple, Consistent Wrappers for Common String Operations. R package version 1.4.0. Available from <https://CRAN.R-project.org/package=stringr>
- [27] Yates, F. (1934). Contingency tables involving small numbers and the  $\chi^2$  test. Supplement to the Journal of the Royal Statistical Society, 1(2), 217-235.
- [28] Zakiev, M. Z. (ed.) (1993). Tatarskaya grammatika [Tatar Grammar]. Vol. 1. Kazan: Tatar Publishing House.
- [29] Zörníg, P., Stachowski, K., Rácová, A., Qu, Y., Místecký, M., Ma, K., Lupea, M., Kelih, E., Gröller, V., Gnatchuk, H., Galieva, A., Andreev, S., Altmann, G. (2019). Quantitative Insights into Syllabic Structures. Studies in Quantitative Linguistics 30. Lüdenscheid: RAM-Verlag.