

# Diversity of dialect maps

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**Keywords:** dialect maps, cartographic analysis, typification, user experiment, cartographic recommendations.

## Abstract:

Although the mapping of languages and their dialects had its beginnings already in the second half of the 19th century, the development of the cartographic representation of language and dialect phenomena has not undergone as significant development in those almost 150 years as other types of thematic maps. The reasons can be found in the excessive separation of the domains of these maps (linguistics and dialectology) and thematic cartography. The consequence of this development is a surprisingly wide diversity of dialect maps across countries, language groups and technological approaches. The paper deals with the comparison of dialect maps and atlases commonly available on the web and in printed forms. 107 dialect maps were included in the comparison, of which 67 were lexical, 35 phonetic and 5 morphologic. All maps were subjected to cartographic analysis from the point of view of map layout, labelling and cartographic methods. Based on the selected criteria, 7 types of dialect maps were defined. According to the defined types, sample dialect maps were compiled in a uniform format, in the same language, and for the same territory. They were also used in the user experiment by three different groups of users – dialectologists, cartographers, and laymen. From the results of the testing, a set of recommendations was formulated for the future production of dialect maps.

## Theoretical background

Dialectology deals with dialects in the territory of the national language, the national language and also language groups. It closely cooperates with other scientific fields of both language (morphology, lexicology or phonetics) and society (sociology, archaeology, folkloristics). Ireinova et al. (2021) describe language atlases as a set of maps focused on a specific geographical area and exploring various linguistic phenomena. They serve not only to present the spatial distribution of language phenomena but also for geolinguistic analyses and, subsequently, to understand the development of a language or the relationship between dialects of the same and another language. The lexical maps focus on the origin of the words themselves, on the different forms of one word according to the dictionary of written Czech, and on the distribution of these forms across the area under study. Phonetic maps show the minimal sound units that distinguish the meaning of words. They can be characterized acoustically and articulately. Morphological maps show different shapes of word endings or roots of words. A number of methods are used in mapping dialects – dialectological and cartographic.

## Methodology

Dialectological maps were gained from internet sources, books and language atlases. The analogue maps were scanned and saved in .jpg or .png formats. The input set of 107 maps contains 48 descriptive features for each map and is divided into two sections – general and evaluation. The general section is used to clearly display the description of the map features (map type, source type, area, word, author, expression method for dialect, expression method for topographic base, topographic base, description, layout elements and map load). Most of them are objectively evaluated from a cartographic point of view. Following Vondrakova and Vozenilek (2016), the evaluation section is used to assess the maps according to the 18 selected criteria. The four groups of criteria assess the cartographic methods for expressing the dialectal phenomenon (point, line and area symbols), the topographic base and the labelling. The use of the methods is recorded quantitatively, i.e. how many times the method was used in the map. The last part of the evaluation section includes a binary assessment of the occurrence of five layout elements in the map by 15 criteria.

## Results

Of the 107 dialect maps, 67 were classified as lexical (63%), 35 phonetic (33%) and 5 morphological (4%). Not only from this sample, it can be concluded that lexical maps, i.e. the vocabulary words themselves, are the most represented, sometimes together with morphemes showing regional variations of words. However, they are always based on

lexemes. The ratio of digital and printed maps (24 lexical maps printed, 43 digital; 15 phonetic maps digital, 20 printed) is the consequence of the fact that most of today's maps are digital, whereas previously printed maps and atlases were used exclusively for making dialect maps. The largest number of maps in the set were from Germany (26), with 31 from German-speaking countries, followed by the Netherlands (11), the Czech Republic (9) and Poland (7). In total, maps from 19 countries.

It was found that the most common method for displaying any linguistic phenomenon is the point symbol – in 42 maps (40%). The second most frequently used method is the area symbol – in 28 maps (27%). Only the line symbol was used in only four maps (3%). All three methods (point, line and area symbol) together were used in 13 maps (12%). Combinations of the two methods occurred exceptionally. Point symbols predominate in both lexical maps (45%) and phonetic maps (31%), followed by area symbols. Surprisingly, 20 maps, all digital, were found to have no labelling. The labelling of the symbol for the dialect phenomenon is used on 65 maps (58%), of which 41 are printed. The labelling of the topographic base (administration units, rivers, cities, neighbouring countries) is only rare, and almost exclusively on printed maps. The labelling of cities is used more systematically.

The map layout was also evaluated through five layout elements. Only 82 maps (77%, mostly printed) had a map title, a quarter of which were cartographically of poor quality. The colours, size and map projection were evaluated for the map face. All criteria for a map face are met for 34 maps (32%), of which the majority are printed; on the contrary, no criterion was met for five maps. The size of the map face in relation to other layout elements was positively detected in 99 maps (93%), the colour design in 77 maps (72%) and the map projection in 45 maps (42%). Again, cartographic accuracy was found for more printed than digital maps. Only 24 maps (22%) meet all the criteria for a map legend, mostly printed maps. An incomplete legend was found for 62 maps (58%), while 21 maps (all digital) had no legend.

Based on the evaluation of individual criteria, typification was performed in order to define the types of dialect maps from a cartographic point of view. Typification resulted in 7 types for lexical and phonetic maps:

- Cartographically complex map
- Map with weaker layout and labelling
- Map with an emphasis on thematic content
- Map with point symbols differentiated by shape and filling and with a poor layout
- Map with area symbols, poor layout and poor labelling
- Map with differentiating point symbols by shape
- Map with area symbols, labelling and poor layout

For the user experiment, two sets of 7 maps were compiled in the resulting dialect map types, one for lexical and the other for phonetic maps. The experiment consisted of three parts. The respondent was gradually presented with sets of maps for so-called free viewing and think-aloud while continuously recording with a voice recorder. In the second part, the respondent chose the best map and determined how the researched word is said in the municipality where it comes from. This task was used to find out if the respondent was able approximately to find a specific location on the dialect map. Finally, the respondent ranked the maps from best to worst according to their overall impression. Three groups of respondents, a total of 50 people, took part in the user experiment. The first group of respondents consisted of 11 cartographers recruited from academicians and students of higher years of cartography and geoinformatics at Palacký University Olomouc. Their view on the dialect maps was very critical. There were negative comments on almost all aspects of the dialect maps evaluated. Based on their comments, two maps were compiled that represent the ideal implementation of a dialect map. The second group of users consisted of 5 dialectologists from the Dialectology Department of the Czech Language Institute of the Academy of Sciences of the Czech Republic in Brno. Their assessment was sometimes the opposite of the assessment of cartographers. Dialectologists demanded the production of dialect maps in a certain contradiction with the cartographic rules only thanks to their professional customs. There were 34 lay users in the third group of users, randomly selected people without cartographic and dialectological knowledge. Across all age groups of lay respondents, some general comments for improvement or better understanding were generally identified, particularly legends, symbol choices, labelling and layout.

## Acknowledgements

This contribution was supported by the Ministry of Culture of the Czech Republic [Grant number DH23P03OVV05].

## References

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