COGNITIVE ASPECT IN CARTOGRAPHY: RATIONAL AND SENSUAL COGNITION

Lyudmila K. Radchenko
Siberian State University of Geosystems and Technologies, 10, Plakhotnogo St., Novosibirsk, Russia, 630108, Ph. D., Associate Professor, Department of Cartography and Geoinformatics, phone (383)361-06-35, e-mail: kaf.kartography@ssga.ru

Olga N. Nikolaeva
Russian State Agrarian University – Moscow Timiryazev Agricultural Academy, Institute of Melioration, Water Management and Construction named after A. N. Kostyakov, 19, Pryanishnikova St., Moscow, 127550, Russia, D. Sc., Professor, Department of Environmental Safety and Natural Resources Management; Siberian State University of Geosystems and Technology, 10, Plakhotnogo St., Novosibirsk, Russia, 630108, Professor, Department of Ecology and Natural Resources Management, e-mail: onixx76@mail.ru

The article discusses the basic terms and concepts of human cognitive ability in terms of cartographic research method and use of cartographic products to gain new knowledge about the environment. The definition of the main forms of cognition (rational and sensual) is given. The main forms of rational cognition are listed. Differences between rational and sensual cognition are formulated. The definitions of the basic operations of rational cognition are given. The role of each of the operations in the process of making and using maps is characterized. The importance of sensual cognition in cartography is noted. The influence of the peculiarities of sensual cognition on perception of the world and cartographic products are given. Conclusions about the increasing role of sensual cognition in the perception of maps, due to the development of geoinformation mapping and computer design are made.

REFERENCES

1. Prokhorov, A. M. (Ed.). (2000). *Bol'shoy entsiklopedicheskiy slovar: A–Ya [Big encyclopedic dictionary: A–Z]* (2nd ed.). Moscow; Saint Petersburg: BSE Publ., 1452 p. [in Russian].

2. Podoprigora, S. Ya., & Podoprigora, A. S. (2015). *Filosofskiy slovar' [Philosophical dictionary]* (3rd ed.). Rostov-on-Don: Phenix Publ., 480 p. [in Russian].

3. Radchenko, L. K. (2020). Cognitive aspect in cartography. *Vestnik SGUGiT [Vestnik SSUGT]*, *25*(4), 138–145 [in Russian].

4. Yankelevich, S. S., Radchenko, L. K., & Antonov, E. S. (2018). From a multipurpose cartographic resource to a "Smart Map". *Vestnik SGUGiT [Vestnik SSUGT]*, *23*(1), 142–155 [in Russian].

5. Thompson, M. A., Lindsay, J. M., & Leonard, G. S. (2017). More Than Meets the Eye: Volcanic Hazard Map Design and Visual Communication. In C. J. Fearnley, D. K. Bird, K. Haynes, W. J. McGuire, G. Jolly (Eds.), *Observing the Volcano World. Advances in Volcanology (An Official Book Series of the International Association of Volcanology and Chemistry of the Earth's Interior*. IAVCEI, Barcelona, Spain. Springer, Cham. Retrieved from https://doi.org/10.1007/11157_2016_47.

6. Leone, F., & Lesales, T. (2009). The interest of cartography for a better perception and management of volcanic risk: from scientific to social representations: the case of Mt. Pelée volcano, Martinique (Lesser Antilles). *Journal of Volcanology and Geothermal Research*, *186*, 186–194. doi: 10.1016/j.jvolgeores.2008.12.020.

7. Daron, J., Lorenz, S., Wolski, P., Blamey, R., & Jack, C. (2015). Interpreting climate data visualisations to inform adaptation decisions. *Climate Risk Manage*, *10*, 17–26. doi: 10.1016/j.crm.2015.06.007.

8. Lieske, David. (2012). Towards a Framework for Designing Spatial and Non-Spatial Visualizations for Communicating Climate Change Risks. *GEOMATICA*, *66*, 27–36. doi: 10.5623/cig2012-006.

9. Cao, Y., Boruff, B., & McNeill, I. (2016). Is a picture worth a thousand words? Evaluating the effectiveness of maps for delivering wildfire warning information. *International Journal of Disaster Risk Reduction*, *19*, 179–196. doi: 10.1016/j.ijdrr.2016.08.012.

10. Cao, Y., Boruff, B. J., & McNeill, I. M. (2017). The smoke is rising but where is the fire? Exploring effective online map design for wildfire warnings. *Natural Hazards*, *88*, 1473–1501. Retrieved from https://doi.org/10.1007/s11069-017-2929-9.

11. Churilova, E. A., & Kolosova, N. N. (2004). *Kartografiya s osnovami topografii [Cartography with the basics of topography]*. Moscow: Drofa Publ., 124 p. [in Russian].

12. Sensuous and rational cognition. (n. d.). Retrieved from https://www.grandars.ru/college/filoso-fiya/chuvstvennoe-poznanie.html (accessed 30.01.2021).

13. Fokina, L. A. (2005). *Kartografiya s osnovami topografii [Cartography with the basics of topography]*. Moscow: Humanitarian Publishing Center "VLADOS", 335 p. [in Russian].

14. Shitikov, V. K., Rosenberg, G. S., & Kostina, N. V. (2005). Methods of synthetic mapping of the territory (on the example of the ecological information system "REGION-VOLGABAS"). In *Sbornik nauchnykh trudov, posvyashchennyy pamyati A. I. Bakanova: Kolichestvennye metody ekologii i gidrobiologii [Collection of Scientific Papers dedicated to the Memory of A. I. Bakanov: Quantitative Methods of Ecology and Hydrobiology]* (pp. 167–227). Tolyatti: Samara Scientific Center RAS [in Russian].

15. Berlyant, A. M. (2002). *Kartografiya [Cartography]*. Moscow: Aspekt-Press Publ., 336 p. [in Russian].

16. Beshentsev, A. N. (2018). Scientific foundations of the information concept of the cartographic method of research. *Vestnik SGUGiT [Vestnik SSUGT]*, *23*(1), 85–110 [in Russian].

17. Giannakopoulou, L, Kavouras, M, Kokla, M, & et al. (2013). From compasses and maps to mountains and territories: experimental results on geographic cognitive categorization. *Lecture Notes in Geoinformation and Cartography* (pp. 63–81).

18. Jia, F., You, X., Tian, J., & et al. (2015). Formal language for the Virtual Geographic Environment. *Environmental Earth Sciences*, *74*, 6981–7002. Retrieved from https://doi.org/10.1007/s12665-015-4756-1.

19. Du, Q., & Ren, F. (2014). Representation model of spatial information in natural language. *Geomat Inf Sci Wuhan University*, *39*(6), 0682–0689. doi:10.13203/j.whugis20140118.

20. Fenli, Jia, & et al. (2015). Cognitive research framework of Virtual Geographic Environment. *Remote Sensing Reviews*, *19*(2).

21. Lin, H., Chen, M., & Lu, G. N. (2013). Virtual geographic Environment: a workspace for computer-aided geographic experiments. *Annals of the Association of American Geographers*, *103*(3), 465–482.

22. How the world maps look like in different countries. (n. d.). Retrieved from https://camer-alabs.org/7747-kak-vyglyadyat-karty-mira-v-raznykh-stranakh (accessed 30.01.2021).