ABSTRACT

This thesis presents a series of inter-related case studies (Kurismaa 2015; Kurismaa and Pavlova 2016; Pavlova, Berlov and Kurismaa 2017) aiming to reexamine, from modern perspectives, one of the most significant and integrative approaches to neurophysiology in the 20-th century – the study of the dominant (учение о доминанте) by the physiologist acad. A.A. Ukhtomsky (1875–1942) and his scientific school. Although recognized as a critical contribution and framework for organism-centered study of physiology, knowledge of this school has remained minimal in the West, and to this day, almost entirely unexplored for its prospects of integration and interrelation with respective foreign research programs in biology and neuroscience, both past and present.

In recent years, and partly on the initiative of the present author, some of the first attempts have been made to overcome these limitations, and to more systematically address the legacy of Ukhtomsky's school from modern perspectives of Western science (Nadin 2015). The present thesis, growing out from these efforts, contributes further materials to such comparative and methodological investigation. It aims specifically to clarify the modern status and significance of the dominant framework as an integrative and organismic paradigm for neuroscientific research, and to show its potentially wide implications for human neuroscience in particular, as a socially and culturally (anthropologically) oriented discipline.

Focused on the questions of historicity and temporal variability (process dynamics, chronogenic variation) as explanatory tools and concepts, the presented case studies touch upon theoretical problems ranging from basic homeostasis at the cellular and network levels, to problems of human labor and social neuroscience. All these applications are shown to derive from the basic physiological paradigm of the dominant, demonstrating its continued significance and integrative potential in the context of modern research, both fundamental and applied.

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2. Kurismaa, A., & Pavlova, L. P. (2016). The dominant as a model of chronogenic change: The relevance of AA Ukhtomsky's and LS Vygotsky's traditions for systemic cognitive studies. In: *Centrality of History for Theory Construction in Psychology* (pp. 125-149). Springer, Cham.
3. Pavlova, L. P., Berlov, D. N., & Kurismaa, A. (2018). Dominant and opponent relations in cortical function: An EEG study of exam performance and stress. *AIMS Neuroscience*, 5(1): 32-55.
4. Nadin, M. (2015). *Anticipation: Learning from the Past.* Cognitive Systems Monographs. Cham, Switzerland: Springer.