**Article Review: The Hypothalamus and its Connection to Behavior**

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**Abstract**

The lateral hypothalamus if critical for the regulation of natural human behavior. The most critical behaviors managed by the hypothalamus include sleep, eating, motion, and sexual behavior. Should the hypothalamus be pathologically impaired, its functions would be impaired, depending on the part of the hypothalamus that is impacted by the disease or disorder. Eating and sleep disorders can be used to define these functions, as they will be used to determine what the hypothalamus helps in when it is functional. Ponomarenko & Korotkova (2017) posit that various hormones with their sources in the hypothalamus are responsible for coordinating natural human behavior. In their study, using a meta-analytical study design, the researchers review these hormones and their role, the communication between the hypothalamus and various regions of the forebrain, and how these interactions inform behavior. In the current paper, a review of their research article is presented, with a focus on the research design, the subjects, results, and the discussions of the findings. Possible shortcomings of the study are also presented.

**Article Review: The Hypothalamus and its Connection to Behavior**

The hypothalamus has numerous functions in the human body. The homeostatic function of the brain, through the hypothalamus, is responsible for human behavior. The brain function of the hypothalamus also comes in through its endocrine function. The hypothalamus is a small section in the brain and is located close to the pituitary gland at the brain's base. Our daily physiological functions, such as sleep, and appetite are controlled by the hypothalamus. It is also responsible for regulating the sexual behavior of people. The anatomy of the hypothalamus is in three primary regions: the anterior region, the middle, and the posterior region. The endocrine function of the hypothalamus is controlled in the anterior region, where the oxytocin hormone is released. Alexey Ponomarenko and Tatiana Korotkova conducted an experimental study to investigate the coordination of human beings' innate behavior by the lateral hypothalamus, a section of the anterior hypothalamus. To guide their study function, the scholars sought to understand the function of the hypothalamus in behavior control by simulating hypothalamic disorders and how they would impact on behavior.

The study’s research design was a meta-analysis approach, where the positions of various scholars are critically reviewed to inform relevant conclusions and inferences on the hypothalamus and innate behavior. Their study reviews recent studies, meaning that the information they use to develop their inferences are based on the most recent evidence-based information. Moreover, Ponomarenko & Korotkova (2017) do not only focus on one aspect of the hypothalamus and behavior but also combine the scholarly studies on the functions of various hormones and neurons and their communications outcome of behavior in the individual. Their study is characterized by an analysis of up to thirty study recent study articles related to the hypothalamus, its anatomy, its role in the coordination of behavior and disorders of the hypothalamus, and the outcome they pose to behavior.

The study does not involve human subjects but instead utilizes other scholars' studies that are recently published. Ponomarenko & Korotkova (2017) first review articles on innate behavior, the substrates that promote neural behavioral coordination, and the possible hypothalamic disorders that influence behavior. The researchers posit that it is critical for the innate behaviors that humans display are controlled to promote quality of life and survival. It is impossible for people to live worthwhile lives if their neurological substrates are impaired and if they are unable to control their behavior (Ponomarenko & Korotkova, 2017). The researchers arrive at this conclusion, informed by the analysis of sixteen articles on neural substrates, innate behavior coordination, and the possible disorders of the hypothalamus that would impair its neurological or endocrine function. The researchers find that people's behavior is not only influenced by the release of hormones but also by the environment they are in. as such, the scholars conclude, from the review of these articles, that environmental stimuli may also influence the hypothalamic coordination of behavior. By this, the authors are introducing a new version of viewing the function of the hypothalamus on influencing human behavior.

The authors also review the articles on manipulating neurological circuits in the hypothalamus and the influence of these circuits on behavior occurrence. The researchers use the foundation of these manipulations as the background of knowledge on which they premise their review of articles on the role of the hypothalamus on behavior. The role of orexin, MCH, and VGAT hormones on the lateral hypothalamus neurons was reviewed based on the presentations of various research articles on the topic. Through a review of seven articles, the researchers inferred that each of these hormones stimulates different behavior based on the part of the lateral hypothalamus they cause an effect. The researchers found that the endocrinal function of the hypothalamus on behavior is sequential, meaning that it occurs in a cycle. For instance, being awake and staying awake is influenced by the orexins, and MCH influences sleep. The researchers reviewed the wake-sleep effect, as was originally presented by various scholars, to develop the final cycle that the authors present in their paper. The researchers also explored optogenetic factors as key players in the influence of behavior by the hypothalamus. The lateral hypothalamus is concluded to be an arousal center, which, when stimulated, influences our sexual behavior, our food habits and patterns as influenced by appetite, and our movement patterns, among other natural human behavior that we exhibit.

Feeding is one of the most critical functions of the hypothalamus when it comes to behavior, concludes Ponomarenko & Korotkova (2017). The authors arrive at this conclusion following a meta-analysis of previous research on the multi-faceted mechanisms of feeding behavior and how the endocrine functions of the hypothalamus influence it. The stimulation of the VGAT and GABA hormones in the hypothalamus causes an optogenetic stimulation of the lateral hypothalamus, which is a key factor in human behavior relating to feeding patterns, and dietary habits. The MCH promotes feeding, even if in lower impacts than GABA and VGAT. When MCH is administered, the feeding habits of an individual may change and gradually become permanent eating behaviors.

The results of their paper were combined, informed by the impact of the hypothalamic hormones on all the behaviors it influences. The results of their study suggested that the hypothalamus is the primary circuit point for the natural behavior of people, which integrates all the stimuli that inform behavior, and coordinates various actions o inform the resultant habits that inform our final behavior. From their meta-analysis of recent research, the researchers also infer that the cortices in the hypothalamus are the sensory and associative tools that make it possible for behavior to be analyzed in an anatomical and resolution approach. Ponomarenko & Korotkova (2017) also conclude that the internal responses of the hypothalamus and the endocrine signals are informed by efferent and afferents outside the hypothalamus itself to inform the behavior of people. Overall, they recommend possible areas for future research on the role of the hypothalamus on the coordination of behavior and provision of clues on behavior change and how to promote positive behavior by manipulating the hypothalamic functions.

**Reflection on Ponomarenko & Korotkova (2017) *To eat? To sleep? To run? Coordination of innate behaviors by lateral hypothalamus***

Ponomarenko & Korotkova (2017) present a critical analysis of the hypothalamus and its role in the coordination of behavior. Using an extensive systematic review of various articles, the researchers have presented a clear indication of the neurological signals and hormones that actively contribute to behavior under the hypothalamus. One of the benefits of using this approach include that the article had a pool of information to inform the research analysis. Additionally, the approach promoted the validity of the conclusions made by the researchers since the chance for false results and errors are minimized. The third advantage of using the approach Ponomarenko & Korotkova (2017) used is that it allowed for the evidence given by other scholars on the subject to the appraised, allowing for relevant conclusions. Finally,Ponomarenko & Korotkova (2017) approach the research process from a different perspective than what is often seen in medical research. By dividing their article reviews into various subtopics, they allow for focus on specific functions of the hypothalamus, which allows for better review and analysis of the specific functions. Focusing on the specific roles ensures that readers are aware of the various parts of the hypothalamus, which promotes the awareness that the hypothalamus as a whole is not what influences behavior. These specific attributes of the research article make it a plausible option for understanding the hypothalamic function in innate human behavior.

Even though effective in explaining the clear role of the hypothalamus in behavior, the article by Ponomarenko & Korotkova (2017) has some shortcomings. First, the authors fail to critically link the research analysis they have conducted in determining the combined function of the hypothalamus. For example, the process of circuit completions is presented in their research, but they fail to explain how each of these neurological functions links to the endocrine functions. However, they account for this shortcoming by discussing each function individually and recommending for further research to link the various roles of the hypothalamus in behavior modification. Another shortcoming of the research paper by Ponomarenko & Korotkova (2017) is the use of the research design they applied. Meta-analytical studies have a tendency to use summarized rather than individual data, which means that some critical information may have been omitted in the process of their meta-analysis. However, this does not impair the research article's success in attaining the set objectives that the researchers had.

Ponomarenko & Korotkova (2017) have successfully linked their two study variables: hypothalamus and behavior coordination. Based on the presentations given in the completed paper, it is possible to conclude that their article is relevant in explaining human behavior and the role played by the hypothalamus to attain this function.

**Reference**

Korotkova, T., & Ponomarenko, A. (2017). To eat? To sleep? To run? Coordination of innate behaviors by lateral hypothalamus. *Neuroforum*, *23*(2), 45-55. <https://doi.org/10.1515/nf-2016-A049>