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BEHAVIOR AND THE ROLE OF GENOTYPE

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Abstract:
The article deals with the traditional question facing the researchers in the field of behavioral genetics - determining the role of genetic factors in determining behavioral characteristics. It is also noted that the general task of behavioral genetics is to combine holistic, "organismal" and molecular biological approaches to create a complete picture of the role of genotype in the formation of the brain, the development of its individual reactions and behavior.

Key words: behavior, human psychological characteristics, cognitive process, research, future.

Behavioral genetics is a branch of genetics devoted to the study of the laws of hereditary conditioning of functional manifestations of the nervous system. The main task is to describe the mechanisms of the implementation of genes in behavioral traits and to emphasize the influence of the environment on this process. Along with other research methods, the method of genetic selection is used here, as a result of which it is possible to purposefully change the properties of the nervous system and behavioral characteristics. Each inherited behavioral trait usually has a complex polygenic nature. Animals at the lower levels of the evolutionary ladder (insects, fish, birds) are characterized by low variability in innate, instinctive actions determined by the genotype. With evolutionary development, the process of forming conditioned reflexes becomes more and more important, and the genotype determines less and less phenotypic variability. Information important for adaptation is not only acquired in one's own experience, but can also be transmitted from parents to offspring through direct communication due to imitative conditioned reflexes. The information obtained in behavioral genetics is of particular importance for the study of human nervous activity in pathologies: mental retardation and mental disorders are often hereditary and are associated with genetic disorders.

Currently, genetic studies of behavior and neurophysiological processes underlying it are being conducted in several directions. Generally, there are two main approaches:

♦ "from behavior to genes" - this is the study of individual signs of the overall behavior of an animal, followed by a more detailed analysis of phenomenology at the level of individual chromosomes and gene complexes or single genes;

♦ "gene-to-behavior" is the study of gene function (at the molecular and physiological level) and then the analysis of its effects on behavior. Modern genetic engineering, which has been developing rapidly in recent decades, has significantly advanced such methods. This approach is also called "reverse genetics". Reverse genetic methods make it possible to change the structure of a gene. A DNA sequence that codes for some protein. These can be, for example, structural proteins that determine the structure of the synaptic apparatus of neurons (modification or deletion of neurotransmitter receptor proteins) or regulatory proteins whose absence makes impossible the normal functioning of processes important for the cell.

Objectives of Behavioral Genetics:

• the relative role of genetic and environmental factors, as well as their interaction in the formation of behavior;

• mechanisms of action of genes that determine the formation of the central nervous system and are expressed in the brain;

• Mechanisms of action of mutant genes affecting the function of the central nervous system, which can serve as a model for diseases of the human nervous system;

• genetic and population mechanisms of behavior formation and its changes in the process of microevolution.

The second and third problems are often identified in the so-called neurogenetic direction.

Selection of behavioral signs. There is no doubt that for the success of genetic research, for example, the ability of an animal to learn, it is necessary to select a behavioral trait that represents the natural "unity" of this or that behavior. As mentioned above, the most commonly used strains of laboratory rodents in behavioral genetics studies are rats and mice. Obviously, in order to conduct research on the genetics of behavior in mice and rats, one must be familiar with their behavior. In addition, it should not be forgotten that the basis of the genetic approach is to determine the variability (variability) of characters.

The essence of the genetic approach is to assess the range of variability of a character in a certain species, population or group of individuals and to analyze the origin of this variability.

During the period of accumulation of facts in behavioral genetics, the attention of researchers was attracted by various signs describing behavior: susceptibility to seizures, general excitability, locomotor activity, orientation-seeking reactions,

various aspects of reproductive behavior, classical and instrumental conditional. reactions, sensitivity to the effects of pharmacological substances. The experience gained during the first period of development of behavioral genetics can be summarized as follows.

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