



# Svetlana Masgutova Educational Institute

The Masgutova Neurosensorimotor Reflex Integration - MNRI® Method

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## Ivan Pavlov, Russian Physiologist 1849-1936

Ivan Pavlov left the theological seminary to pursue a career in physiology after reading Darwin's "The Origin of the Species" and Ivan Sechenov's "Reflexes of the Brain." His main area of study was on the digestive process and the interaction between the nervous system and the autonomic functions of the body.

Although Pavlov received the Nobel Prize (1904) for his work related to digestion and salivary secretion, Pavlov is best known for his study of conditional reflexes, which occupied the second half of his career. In his experiments, he first put meat powder in a dog's mouth causing the dog to salivate. This is an example of an innate reflex. He then rang a bell each time he placed the meat powder in the dog's mouth and found that after some repetition the dog would salivate upon hearing the bell alone. This is an example of a conditional reflex, which is perhaps the simplest form of a learned behavior, so simple that it can often occur passively without our awareness. In this case, Pavlov's dog transferred an innate 'unconditional' response (salivation), from the 'unconditional' stimulus (the food) to a learned 'conditional' response (salivation) from the 'conditional' stimulus (the bell).

*(Note: Pavlov always used the word conditional reflex and not conditioned reflex. Because of an early mistranslation from Russian to English, the word conditioned has become common in English text. This is an important distinction because conditioning implies that a response is dependent upon existing conditions and circumstances. This sense of dependence is lost when the word conditioned is used because it suggests a fixed state and assigns a greater importance to repetition than may be the case in highly charged emotional situations.)*

Through his work with dogs, Pavlov not only demonstrated conditional reflex behavior, he confirmed the presence of innate reflexes in the body that engage automatically without training or learning. These basic automatic reflexes are used by the body either to protect itself from outside harm (i.e. blinking in reaction to something coming at the eye, vomiting when something dangerous enters the system), or to ensure its survival (i.e. salivation in reaction to the sight of food).

Pavlov's research elucidated to two types of conditional reflexes: excitatory conditional reflexes (reflexes that engage in action) and inhibitory conditional reflexes (reflexes that engage in inaction). These two opposing processes became the building blocks for Pavlov's conditional reflexes. Pavlov came to understand that that when a conditional stimulus exceeds a certain intensity; that is, an intensity which may lead to damage to the nerve cells, the body protects itself by shutting down the excitatory reflex and invoking an inhibitory reflex.

Pavlov believed that a conditional reflex originated in the cerebral cortex, making it primarily a cortical phenomenon. He thought of excitation and inhibition as being dependent on chemical substances in the brain, which was a novel idea for the time as this was prior to the biochemical work and the discovery of acetylcholine and other neurotransmitters. (The Central Nervous System and Behavior, W. Horsely Grant – Pavlovian Laboratories, Johns Hopkins University, p. 173) This insight is a precursor to the later work of Langley, who identified the autonomic nervous system, of Hess, who demonstrated cerebral influence over the autonomic nervous system, and of Cannon, who revealed the many reflexive responses engaged in the body during alarm and normative function states.

Pavlov was a pioneering figure in the study of behavioral physiology. His work also had a tremendous influence on the development of reflexes and learning, and on the emerging field of behavioral psychology. The greatest challenge for those who advanced Pavlov's work would be in understanding which types of behavior could be explained by Pavlov's work (reactive) and which types of behavior could not be explained (active).