Nervous System

by Sophia

WHAT'S COVERED

This tutorial will cover the nervous system, specifically the functions of the central nervous system (CNS) and the peripheral nervous system (PNS). You will reflect on the central nervous system's role in your self and social awareness skill. Our discussion breaks down as follows:

1. Nervous System

The **nervous system** is the body's communication system. It sends information to and from the brain and allows it to control the rest of the body and its actions. It is made up of individual neurons, which are the cells that transmit information within the nervous system.

The nervous system consists of two systems:

- Central Nervous System (CNS)
- Peripheral Nervous System (PNS)

TERM TO KNOW

Nervous System

The body's communication system, which sends information to and from the brain and allows it to control the rest of the body.

2. Central Nervous System

The **central nervous system (CNS)** is the area of the body which acts as the control center for the rest of the nervous system. It collects information from the rest of the body and everything outside of it, then sends out information and causes the body's various responses.

The most recognizable part of the central nervous system is the**brain**. The brain is housed inside of your head and is the central processing unit of the nervous system and the rest of the body.

The CNS is where everything that we think of as being a person and being human is housed. All of the things that involve personality and mental states in thinking and deciding and planning—all of those things are housed directly within the brain. As you can see, it's the most important thing in psychology, and the most important organ in the body.

Self and Social Awareness: Skill Reflect

When you receive information that makes you think about how you perceive the world around you or when you feel emotions and consider what is triggering that response, your self and social awareness skill is growing because of the central nervous system.

The other main part of the central nervous system is the **spinal cord**, which is a thick bundle of neurons that connects directly to the brain and runs along your back. This is also where you'll find the vertebrae, which protect the spinal cord.

HINT

Think of the spinal cord as an information superhighway. It conducts information to the rest of the body and vice versa.

When the spinal cord is damaged, it can lead to paralysis of different parts of the body. Because it acts as a conductor for all of this information, if a certain part is damaged, then none of those messages can be sent to the corresponding parts of the body.

The spinal cord also acts as a control for certain reflexes, which don't go directly to the brain, but rather simply go to the spinal cord and cause a quick involuntary response by the body.

TERMS TO KNOW

Central Nervous System (CNS)

The control center of the nervous system, which collects information from the rest of the body and causes the body's responses; contains the brain and spinal cord.

Brain

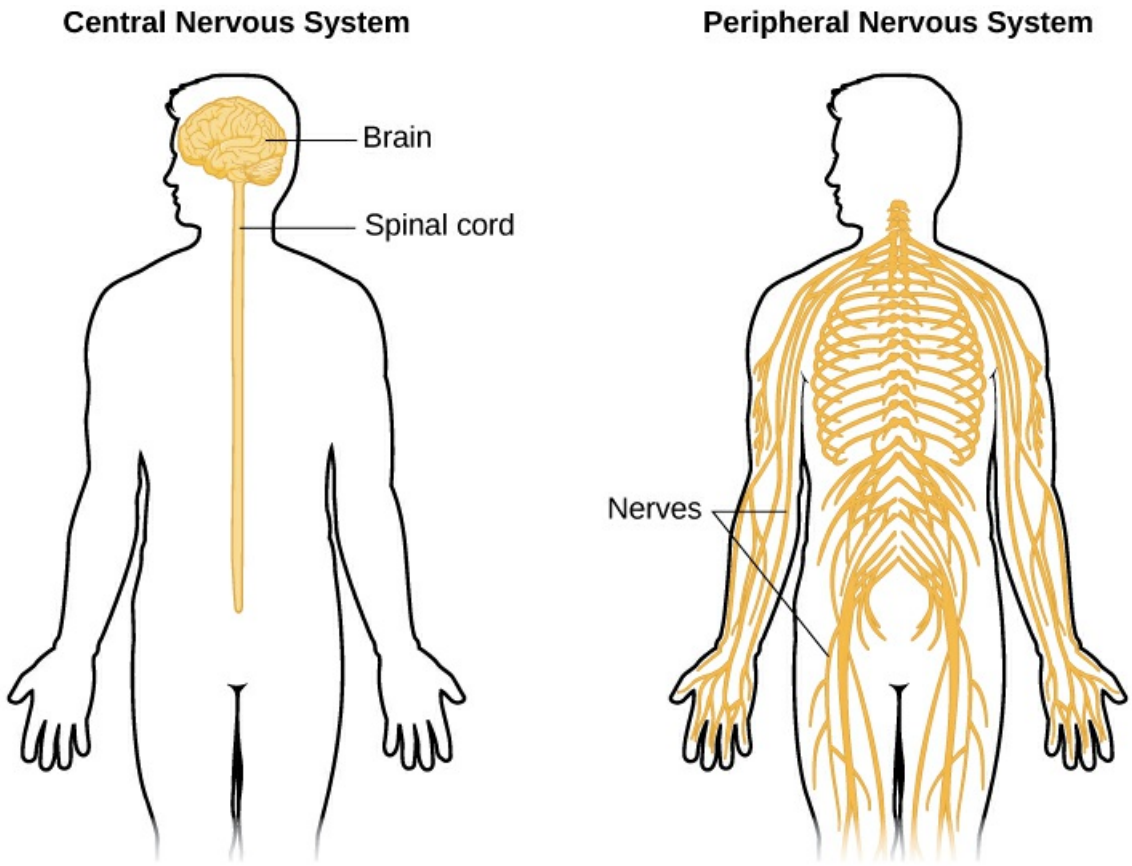
Central processing unit located in the head, where all mental information about a person is kept and used to control the rest of the body.

Spinal Cord

A thick bundle of nerves that connects to the brain and acts as an "information superhighway," conducting info to and from the brain along the back.

3. Peripheral Nervous System

The second part of the nervous system is the **peripheral nervous system (PNS)**. The PNS essentially includes the rest of the neurons that are within the body—everything outside of the brain and spinal cord.



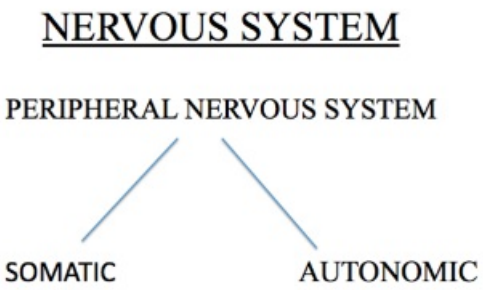
The peripheral nervous system acts to control muscles and to carry sensory information from the outside world. It also controls involuntary behaviors, like the functioning of our organs.

> ↱ EXAMPLE The peripheral nervous system tells your stomach when to digest and when to grumble, as well as telling your heart how to beat.

The PNS also controls involuntary reactions. Sweating, for example, is a result of the PNS responding to the outside environment.

The peripheral nervous system is divided into two parts:

- Somatic nervous system
- Autonomic nervous system



TERM TO KNOW

Peripheral Nervous System (PNS)

The neurons in the rest of the body outside of the brain and spinal cord, which control muscles, carry sensory information from the environment, and control involuntary actions.

3a. Somatic Nervous System

The **somatic nervous system** includes all of the nerves that connect to the sense organs and the skeletal muscles within the body. It controls all of the voluntary behavior and the motor neurons, which help to move the body. These motor neurons allow for actions like drawing, jumping, running, and anything that we control directly.

Motor neurons can also control involuntary reactions, those called the **reflex arc**, which are simple, automatic responses to stimuli in the world.

> ↱ EXAMPLE When you go to the doctor's office and they hit your knee to see if your knee reacts very quickly, it's not an action that you necessarily control. The stimuli, the hitting of the knee, sends a reaction—not directly to your brain, but rather just to your spinal cord. The spinal cord is where reflex arcs are controlled. Then, that response is sent right back to your leg more quickly than if it had to go directly to your brain, and this is what allows your knee to give a quick, reflexive jerk.

Sensory neurons are also controlled in the somatic system, which is responsible for smell, taste, sight, as well as the skin for touch. As you can see, the somatic system covers quite a lot of ground.

TERMS TO KNOW

Somatic Nervous System

Nerves connected to the sense organs and skeletal muscles, which control voluntary movement, reflexes, and sensory neurons.

Reflex Arc

Simple, automatic responses to stimuli.

Sensory Neurons

Neurons that send information to brain from sense organs.

3b. Autonomic Nervous System

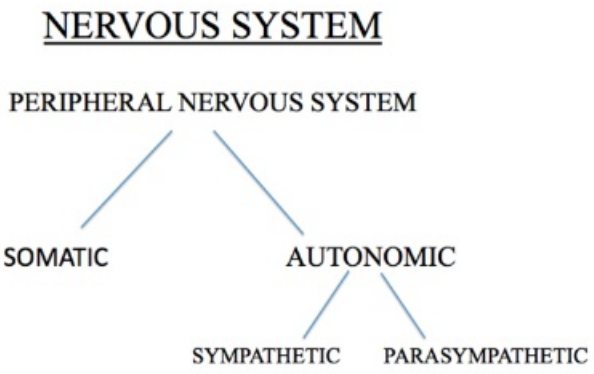
The **autonomic nervous system** includes all of the nerves within the rest of the body that connect to the internal organs. They control all of the internal involuntary body functions like breathing, which we can control voluntarily but that generally is something that we do automatically, outside of our control. These nerves also control functions like heart rate and digestion.

HINT

The name itself, “autonomic,” looks a little bit like the word “automatic,” which may help you remember that this system is responsible for automatic, involuntary reactions.

The autonomic nervous system is further subdivided into two different parts:

- Sympathetic nervous system
- Parasympathetic nervous system



TERM TO KNOW

Autonomic Nervous System

Nerves connected to internal organs, which control internal, involuntary body functions (like breathing, heart rate, and digestion).

3b.i. Sympathetic Nervous System

The **sympathetic nervous system** controls any body responses that are related to fight or flight. This is a protective response that kicks in when you feel like you're in danger.

The sympathetic branch of the autonomic nervous system is responsible for the following responses:

- Increase in heart rate
- Dilation of pupils
- Release of adrenaline
- Halt in digestion
- Release of the bladder

↱ EXAMPLE When you feel threatened, perhaps your heart beats faster or your palms sweat. This is a result of the sympathetic nervous system. Sometimes, people get so excited that they might throw up or accidentally urinate themselves. This is also the sympathetic nervous system in action.

TERM TO KNOW

Sympathetic Nervous System

Controls body responses related to “flight or fight” response, when feel like we are in danger.

3b.ii. Parasympathetic Nervous System

While the sympathetic nervous system excites the body, the**parasympathetic nervous system** keeps it at a normal level. It decreases the body from an excited state to a lesser level and helps to maintain the body after the danger has passed.

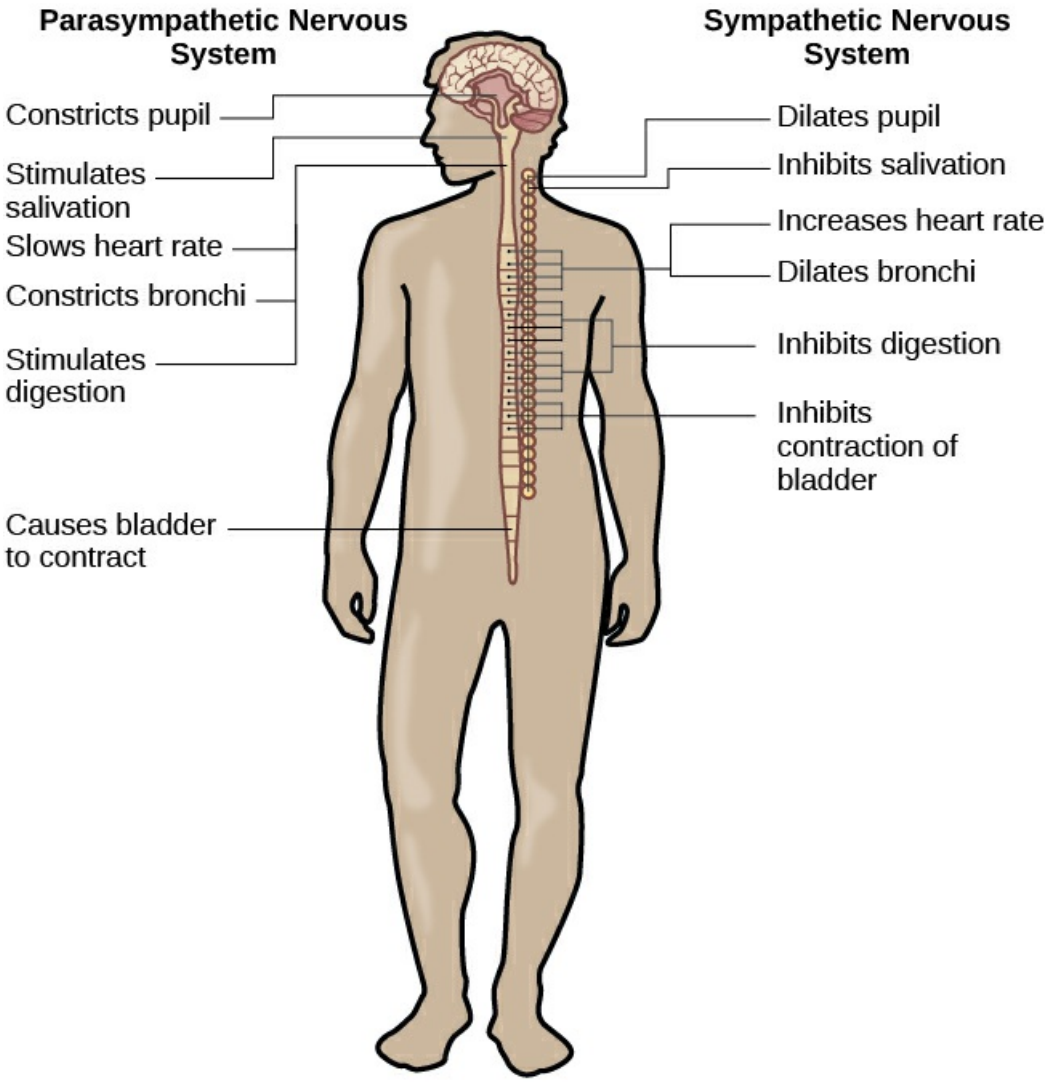
The parasympathetic branch of the autonomic nervous system:

- Constricts pupils
- Stimulates digestion to get you back on track
- Slows the heart rate
- Makes you feel more calm

↗ EXAMPLE Suppose someone is driving too close behind you and honking the horn. Once they turn off, you take a deep breath and your hands are no longer sweaty. This is a result of the parasympathetic nervous system.

BIG IDEA

The sympathetic and parasympathetic divisions of the autonomic nervous system have the opposite effects on various systems.



TERM TO KNOW

Parasympathetic Nervous System

Helps to maintain normal body functions and calm it down when excited by the sympathetic nervous system.

SUMMARY

This lesson focused on the nervous system. It is broken into two parts: the **central nervous system (CNS)** and the **peripheral nervous system (PNS)**. The central nervous system is comprised of the brain and spinal cord. You learned that this system plays a role in your reactions when you use your self and social awareness skill. The peripheral nervous system comprises the rest of the neurons outside

the brain and spinal cord and acts to control involuntary reactions to the outside world.

Good luck!

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TERMS TO KNOW

Autonomic Nervous System
Nerves connected to internal organs, which control internal, involuntary body functions (like breathing, heart rate, and digestion).

Brain
Central processing unit located in the head, where all mental information about a person is kept and used to control the rest of the body.

Central Nervous System
The control center of the nervous system, which collects information from the rest of the body and causes the body's responses; contains the brain and spinal cord.

Nervous System
The body's communication system, which sends information to and from the brain and allows it to control the rest of the body.

Parasympathetic Nervous System
Helps to maintain normal body functions and calm it down when excited by the sympathetic nervous system.

Peripheral Nervous System
The neurons in the rest of the body outside of the brain and spinal cord, which control muscles, carry sensory information from the environment, and control involuntary actions.

Reflex Arc
Simple, automatic responses to stimuli.

Sensory Neurons
Neurons that send information to brain from sense organs.

Somatic Nervous System
Nerves connected to the sense organs and skeletal muscles, which control voluntary movement, reflexes, and sensory neurons.

Spinal Cord
A thick bundle of nerves that connects to the brain and acts as an "information superhighway," conducting info to and from the brain along the back.

Sympathetic Nervous System
Controls body responses related to "flight or fight" response, when feel like we are in danger.