

# BRAIN, BODY, & BEHAVIOR

A quick guide to understanding the role of the nervous system in responding to threat and safety.

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## How does the brain influence my child's feelings and behaviors?




One of the essential functions of the brain is to protect us from threats in the internal (i.e., inside the body) and external (i.e., outside the body) environment. To do this, the brain utilizes the nervous system, a complex highway of nerve fibers throughout the body, to send and receive information between the brain and major organs. **Using information gathered via the nervous system, the brain determines whether we are safe or unsafe, which impacts our feelings, bodily sensations, bodily functions, and behaviors.**

## How does the brain detect safety vs. threat?

**Through a process called nuerception, the nervous system takes in information from the internal and external environment to determine whether we are safe or unsafe at any given moment.** This subconscious process helps our minds and bodies know how to feel and behave in different environments. When our nervous system detects safety, our parasympathetic nervous system is activated, allowing us to relax, experience positive moods, and engage in prosocial behaviors such as connection, attachment, and cooperation. When our nervous system detects threat, our sympathetic nervous system is activated, triggering defensive strategies such as fight, flight, or freeze. Nuerceptions of threat trigger the fight or flight response, while nuerceptions of extreme danger trigger neurological withdrawal, resulting in the freeze response.

## States of Arousal

Using information gathered via nuerception, the brain decides whether we are safe, unsafe, or in extreme danger. Our nuerception of the environment determines our state of arousal, which influences bodily processes, feelings, and behaviors. Our nuerception of the environment impacts our brain, body, feelings, and behavior in the following ways.

|   | Brain  | Body   | Feelings  | Behavior   |
|---|--|--|---|--|
| <br><b>Nuerception of Safety</b>         | <ul style="list-style-type: none"><li>Parasympathetic ventral vagal activation (Optimal arousal)</li></ul> | <ul style="list-style-type: none"><li>Homeostasis</li></ul>  | <ul style="list-style-type: none"><li>Calm</li><li>Social</li><li>Curious</li><li>Playful</li></ul>   | <ul style="list-style-type: none"><li>Attention</li><li>Eye contact</li><li>Social engagement</li><li>Play</li></ul>               |
| <br><b>Nuerception of Threat</b>         | <ul style="list-style-type: none"><li>Sympathetic activation (Hyperarousal)</li></ul>                      | <ul style="list-style-type: none"><li>Increased heart rate, blood pressure, muscle tension, and stress hormones</li><li>Cognitive impairment</li></ul> | <ul style="list-style-type: none"><li>Irritability</li><li>Frustration</li><li>Anger</li><li>Rage</li><li>Panic</li><li>Confusion</li></ul> | <ul style="list-style-type: none"><li>Screaming</li><li>Crying</li><li>Aggression</li><li>Running away</li></ul>                   |
| <br><b>Nuerception of Extreme Danger</b> | <ul style="list-style-type: none"><li>Parasympathetic dorsal vagal activation (Hypoarousal)</li></ul>      | <ul style="list-style-type: none"><li>Decreased heart rate and muscle tension</li><li>Cognitive impairment</li></ul>                                   | <ul style="list-style-type: none"><li>Dissociated collapse</li><li>Fear</li><li>Withdrawal</li><li>Isolation</li></ul>                      | <ul style="list-style-type: none"><li>Shutting down</li><li>Spacing out</li><li>Social withdrawal</li><li>Immobilization</li></ul> |

## Nuerception of Safety: An Example

Imagine you visit the home of a long-time friend. When your friend answers the door, they greet you with a smile, a warm hug, and tell you they are happy to see you. You walk in and see their spouse relaxing on the sofa while their children laugh and play on the floor. You smell the delicious meal they've prepared. Your brain takes all of this information in and subconsciously lets you know that you are safe. No threat is detected. As a result, your body relaxes, you feel happy and connected, and you are able to engage with your friend. **Your nervous system is activating a safety response.**

## Nuerception of Threat: An Example

Imagine you visit the same friend. You walk up to the front door and it is slightly open. You walk in and see that the home appears ransacked. You smell food burning in the oven. You call out for your friend but do not receive a response. As the nervous system takes in this information, your brain detects threat. Your blood pressure rises, your heart rate increases, you begin to sweat, muscle tension increases, you feel fear, clench your fists, and experience a feeling in your gut that something is wrong. **Your nervous system is activating a defensive response.**

## What factors influence nuerceptions of safety vs. threat?

Several factors influence whether the brain detects safety or threat in the environment. Other people's behaviors (such as tone, movements, and facial expressions), whether or not an environment is as we expect it to be, as well as our memories and past experiences can impact the process of nuerception. Additionally, **experiences such as trauma, breakdowns in attachment in early childhood, neurodivergence, and developmental delays may contribute to hypersensitive nuerception (detecting threat when there is none) or hyposensitive nuerception (detecting safety in an unsafe environment).**

### References

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