

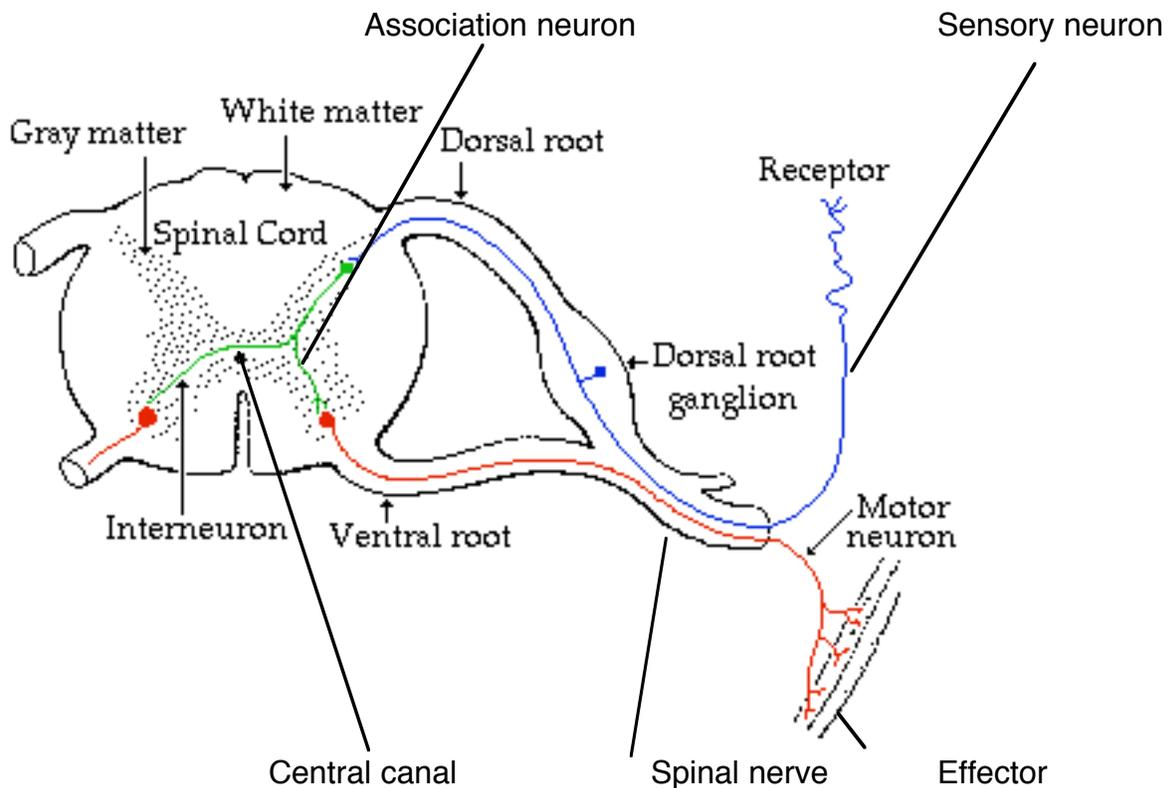
Innate Behavior

A. Definitions

1. Innate behavior - behavior which normally occurs in all members of a species despite natural variation in environmental influences.
Ex) migration in birds, taxis, kinesis
2. Stimulus - a change in the environment (internal or external) that is detected by a receptor and elicits a response.
3. Response - reaction to a stimulus
4. Reflex - a rapid, unconscious response

B. Spinal Reflexes

1. General
 - a. they involve the spinal cord - not brain
 - b. part of innate behavior
 - c. receptor neurons = sensory n.; effector neurons = motor n.
2. Pain Withdrawal Reflex
 - a. hurt finger
 - b. receptor neuron sends action potential to spinal cord
 - c. it is relayed via association neuron to effector neuron
 - d. effector neuron ends at effector (biceps muscle)
 - e. biceps contracts causing finger to be drawn away.
3. Knee Jerk Reflex
 - a. Knee tap causes stretched tendon
 - b. stretch receptor in muscle sends action potential to spinal cord
 - c. action potential passed to effector neuron
 - d. muscle (effector) contracts
4. Diagram



C. Natural Selection and Behavior

1. Innate behavior patterns (instincts) are genetically inherited responses to environmental stimuli.
2. They develop by natural selection because some innate behavior makes members of the species better adapted to their environment, and increase their chances for survival and reproduction (to pass on the trait). These behaviors are selected for.
3. Hedgehog Example
 - a. Hedgehogs roll up in a ball when they feel threatened.
 - b. A car approaches, hedgehog rolls up, and is killed.
 - c. EVIDENCE of: some hedgehogs run away, instead.
 - d. If this is genetic, selection would favor these hedgehogs.
4. The bird Sylvia atricapilla (blackcap)
 - a. breeds during the summer in Germany
 - b. migrated to Spain or other Mediterranean areas for winter.
 - c. NOW, studies show 10% of blackcaps migrate to the UK instead.
 - d. To test whether this change is genetically determined or not

(and, therefore, whether it could have developed by natural selection or not), eggs were collected from parents who had migrated to the UK in the previous winter and from parents who had migrated to Spain. The young were reared and the direction in which they set off, when the time for migration came, was recorded. Birds whose parents had migrated to the UK tended to fly west, wherever they had been reared, and birds whose parents had migrated to Spain tended to fly south- west. Despite not being able to follow their parents at the time of migration, all the birds tended to fly in the direction that would take them on the same migration route as their parents. This and other evidence suggests that blackcaps are genetically programmed to respond to stimuli when they migrate so that they fly in a particular direction. The increase in the numbers of blackcaps migrating to the UK for the winter may be due to warmer winters and greater survival rates in the UK.