

CHP:12

Animal Behavior



TOPIC:
DEVELOPMENT OF
BEHAVIOR

What Is Behavior?

- **Behavior** is anything an animal does in response to a stimulus.
 - A **stimulus** is an environmental change that directly influences the activity of an organism.
 - *Example: Heat stimulates the lizard to seek shade.*



The Development of Behavior

- Behavior has both genetic (nature) and learned components. (Environment - nurture has an effect)
- Imprinting: a form of learning in which a young animal forms a social attachment to other individuals or develops preferences that will influence behavior later in life.
 - Sensitive period: time in the organism's life when imprinting is effective.
- Animals may have an innate genetic template that guides their learning as behavior develops.

Development depends on maturation and learning

- Maturation refers to the sequential characteristic of biological growth and development.
- The biological changes occur in sequential order and give children new abilities.
- Changes in the brain and nervous system account largely for maturation. And help children to improve in thinking and motor skills.
- Children must mature to a, certain point before they can progress to new skills.

Maturation



Some behavior patterns appear only after a specific developmental stage or time. This stage or time is called maturation.

Example:

In humans, The voice of males changes at the time of puberty.

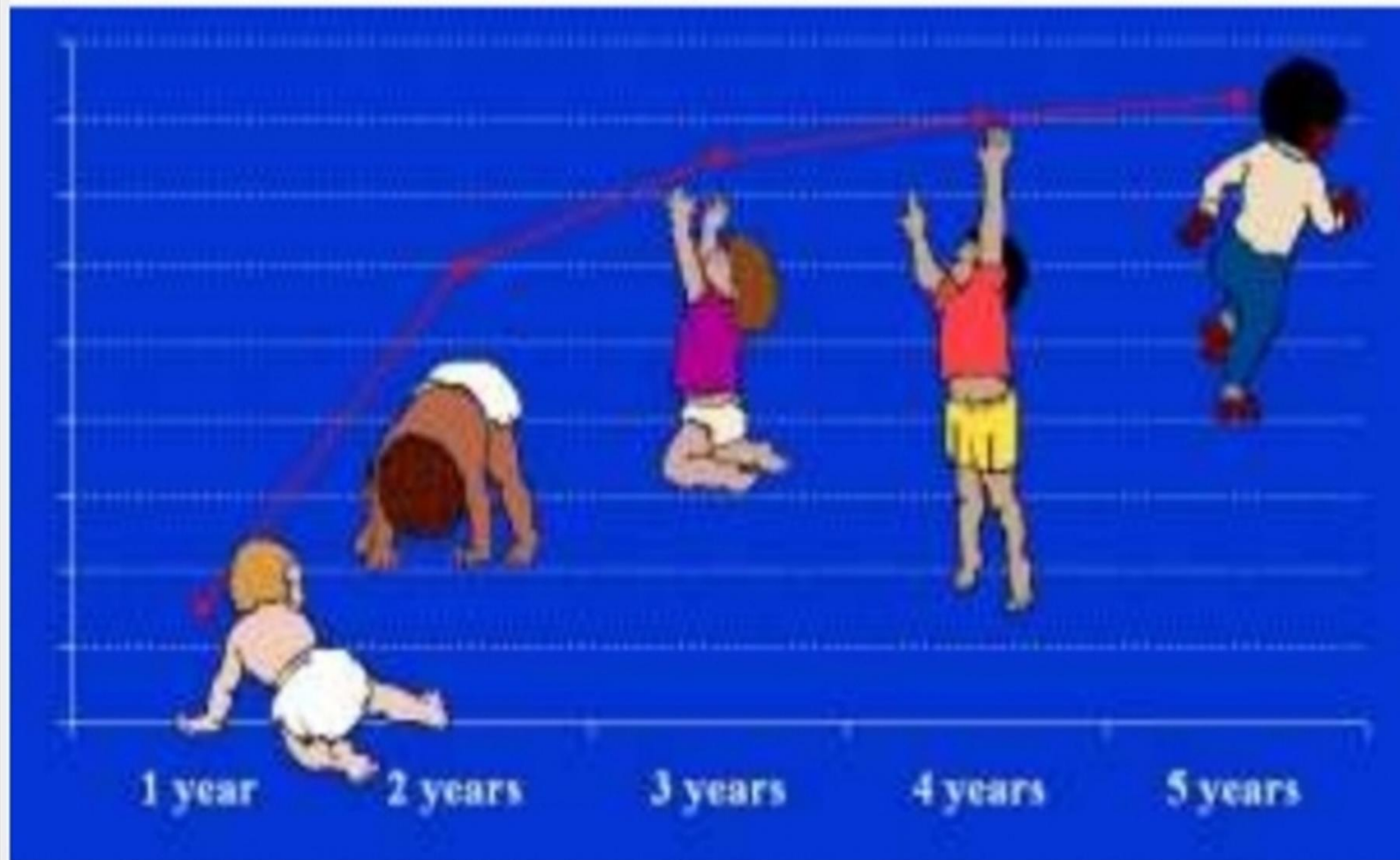
Genes are responsible for maturation in behavior



Behavioral Genetics

Behavioral genetics studies heritability of behavioral traits, and it overlaps with genetics, psychology, and ethology (the scientific study of human and animal behavior). Genetics plays a large role in when and how learning, growing, and development occurs. For example, although environment has an effect on the walking behavior of infants and toddlers, children are unable to walk at all before an age that is predetermined by their genome. However, while the genetic makeup of a child determines the age range for when he or she will begin walking, environmental influences determine how early or late within that range the event will actually occur.

Growth chart



Gene selection

Genes can be manipulated by selective breeding, which can have an enormous impact on behavior. For example, some dogs are bred specifically to be obedient, like golden retrievers; others are bred to be protective, like German shepherds. In another example, Seymour Benzer discovered he could breed certain fruit flies with others to create distinct behavioral characteristics and change their circadian rhythms.



Instincts and learning

- **Instincts:**

The inherited behavior is called instincts.

- **Learning:**

The change of behavior by life experience is called learning.

Instinct vs. Learning

- Instinct – reflexes, reactions, knowledge an animal is born with
 - Ex.- hunger, fear, motion, imprinting
- Learning – must be taught, not born with it
 - Ex.- speech, riding a bike, reading



Extinct/learning Interaction



There are following examples of interaction of instincts and learning.

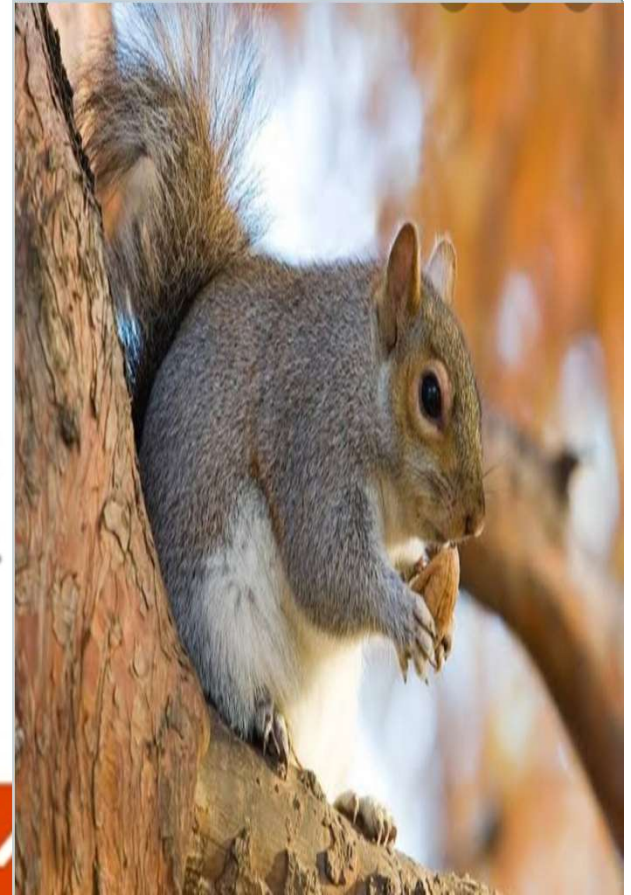
1. Young bobcats were kept in isolation. They had no chance to catch live prey.

A white rat was placed with them. They did not attack it. They attacked the rat only which it tried to escape. Their attacks were not efficient at first. But after some experience, they captured the prey by the neck and rapidly killed them. Thus learning refines inherited behavior. Learning occurs during play with littermates under normal conditions.

Example of nut cracking behavior

2. The nut cracking behavior of squirrels is an example of interaction of instincts

and learning. Squirrels gnaw (grind) and pry (throw on ground) to open a nut. Inexperienced squirrels are not efficient. They gnaw and pry randomly on the nut. Experienced squirrels gnaw a furrow on the broad side. Then they insert their lower incisors into the furrow and crack the nut open.



IMPRINTING



- The attachment of a young animal toward another animal or object is called imprinting.
- It is a rapid learning process.
- The attachment is formed soon after hatching or birth.



A type of behavior that clearly shows the influence of both genes and environment is **imprinting**. Like instinct, imprinting results in fixed, lifelong behaviors after exposure to a stimulus. Also like instinct, imprinting leads to full-blown behaviors after the first exposure to the stimulus. However, **the environment** also plays a role in imprinting. The animal must be exposed to the proper stimulus during a period of **development** called the critical period. This period is commonly a few days or weeks in early life. In addition, the type of stimulus that triggers an imprinted behavior determines how the behavior is performed. Therefore, imprinting depends on both instinct and learning and may vary with the environment.



Kcnrad Lorenz (1903-1989) conducted experiments on geese. He allowed the geese to imprint on him. The goslings (offspring of geese) followed him like their mother. Imprinting occurs in many species of birds. They young follow the parent soon after birth. They recognize their parents by imprinting. Then parents lead them to the nest or to water. Both visual and auditory cues (sign) are important in imprinting systems.

