



# Chapter 1: Introduction to Motor Development

# OUTLINE

- o Definitions
- o Elements of developmental change
- o Concepts of development, maturation, and growth
- o Common terms in motor development
- o Age periods and stages of human development
- o History of the field of motor development

# WHAT IS MOTOR DEVELOPMENT?

- o A process through which we pass during the course of our life.
  - o Change that occurs in our ability to move as we proceed through the lifespan.
- o A field of study
  - o The study of changes in human motor behavior over the lifespan, the processes that underlie these changes, and the factors that affect them.

# MOTOR DEVELOPMENT

- o Is the sequential
- o continuous age
  - o related process whereby movement behaviour changes

# MOTOR LEARNING

- Refers to the relatively permanent gains in motor skill capability associated with practice or experience.

# MOTOR CONTROL

- Is the study of the neural, physical, and behavioural aspects of movement.

# Controversial Research Approaches

**There are two diverse approaches to studying motor development:**

o *Product (Task-Oriented) Approach:*

o Emphasizes the outcome of a movement

o How much control did the child have while catching the ball?

o *Process Approach:*

- o Emphasizes the movement without consideration for the outcome
- o What technique did the child use to catch the ball?

*Human behavior is not compartmentalized; there is a complex system of constant, reciprocal exchanges among an individual's cognitive, affective, motor, and physical being.*

# Domains of Human Development

- o The four domains are useful for categorizing the study of human and motor development.
- o Domains are not discrete.

# DOMAINS

- *Cognitive:*

- Concerns human intellectual development

- *Affective:*

- Concerned with the social and emotional aspects of human development

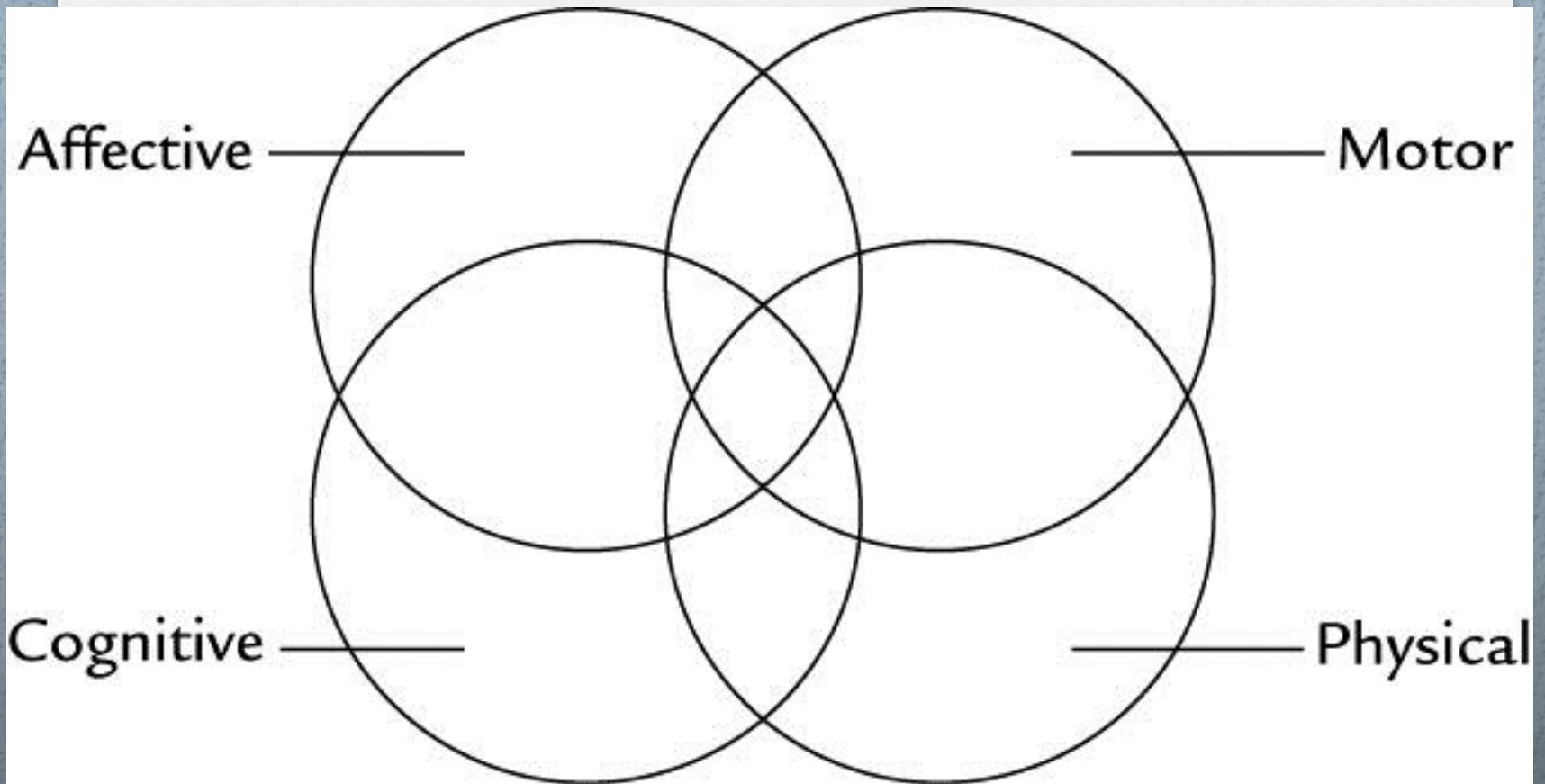
- *Motor:*

- Development of human movement and factors that affect that development

- *Physical:*

- All types of physical/bodily change

# Domains of Human Development



# Why is the study of motor development important?

- Helps us to fully understand human development.
- Enables us to diagnose problems in individuals who may not be following a normal course of development.
- Allows us to structure developmentally appropriate programs / curricula.

*“...**changes** that all human beings face **across their lifespan**. Such changes result from **increasing age** as well as one’s **experiences** in life, one’s **genetic potential**, and the **interactions** of all three factors at any given time.*

*Therefore, development is an **interactional process that leads to changes in behavior over the lifespan.**”*

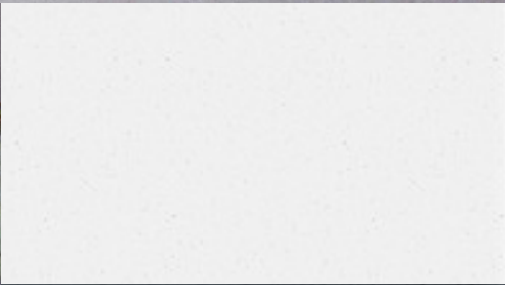
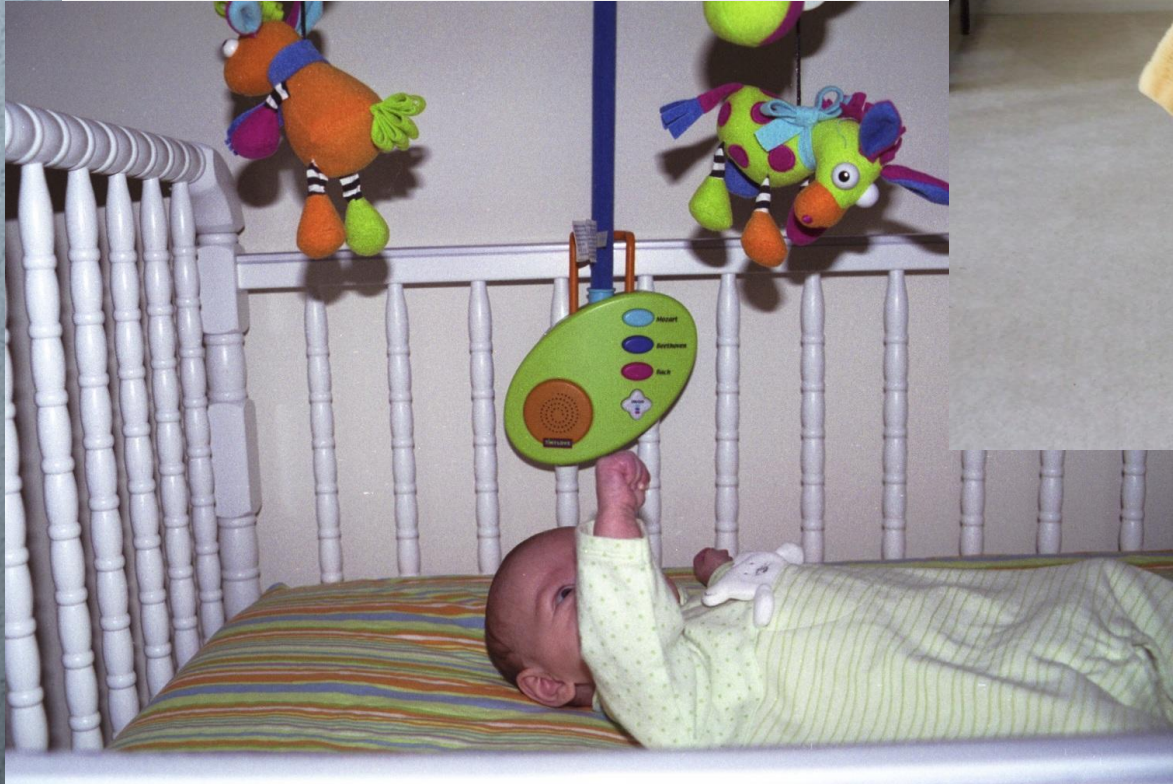
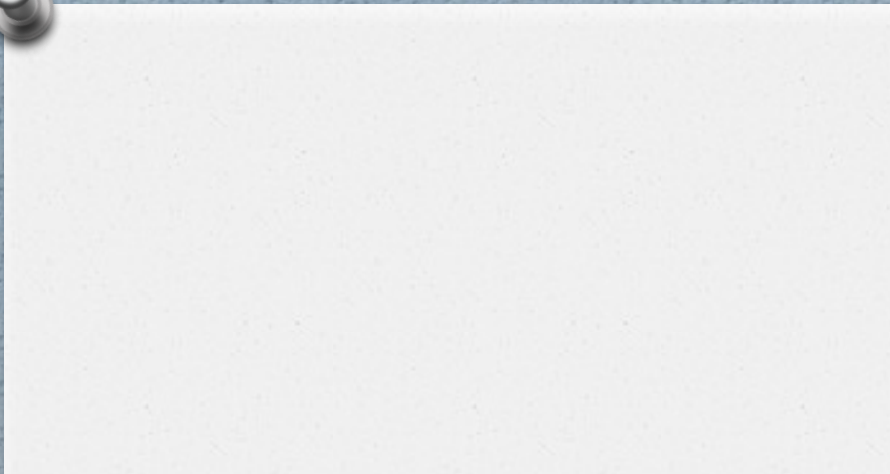
*(Motor Development Task Force, 1995)*

# “Developmentally Appropriate”

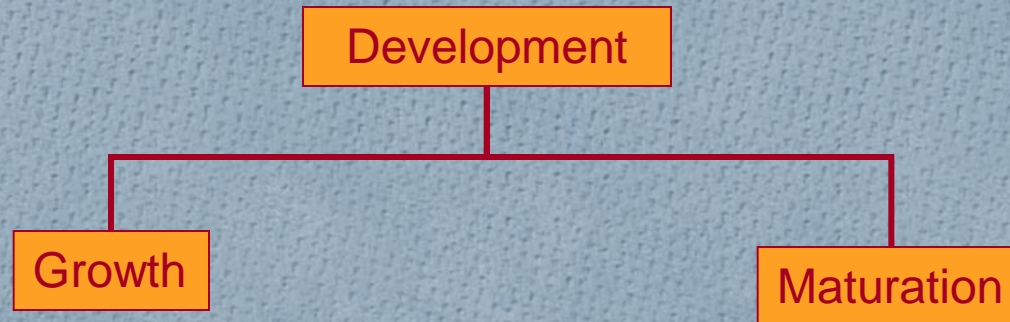
- o Increasingly popular term over the past few decades.
- o Programs claim to be both appropriate for the child’s age group and appropriate to the child’s individual needs.
- o Term is often misused and abused.

# Elements of Developmental Change

Qualitative	Not “just more of something”
Sequential	Certain motor patterns precede others
Cumulative	Behaviors are additive
Directional	Development has an ultimate goal
Multifactorial	No single factor directs change
Individual	Rate of change varies for all people



# Development, Growth and Maturation



*Development includes both growth and maturation*

- ***Development*** refers to the progressions and regressions that occur throughout the lifespan.
- ***Growth*** refers to the structural aspects of development.
- ***Maturation*** refers to the functional changes of development

# Growth and Maturation

- o Growth is quantitative
  - o E.g. increase in size
- o Maturation is qualitative
  - o E.g. functions of organs and tissues
- o Growth and Maturation
  - o Interrelated (e.g. as body grows, functions improve)
  - o Different (e.g. as we age, growth slows, but maturation can continue through lifespan)

# General Motor Development Terms

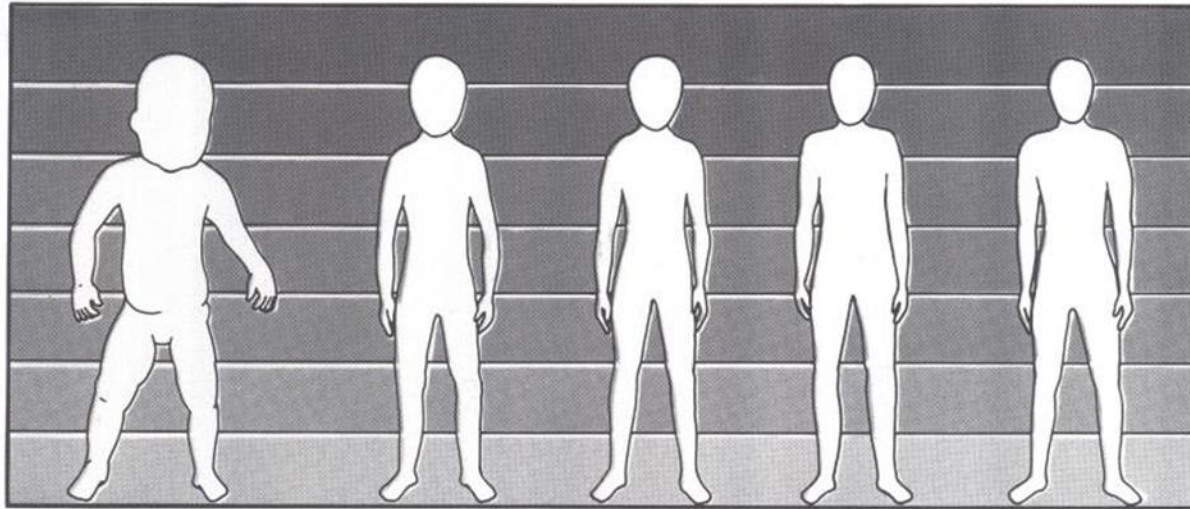
- o Developmental Directions

- o *Cephalocaudal*

- o From **head to tail** (i.e. head to feet)

- o Growth – E.g. Head size of infant relative to body.

- o Movement Ability – E.g. Toddler learning to walk.



The changes in proportions from birth to adult

# General Motor Development Terms

- o Developmental Directions

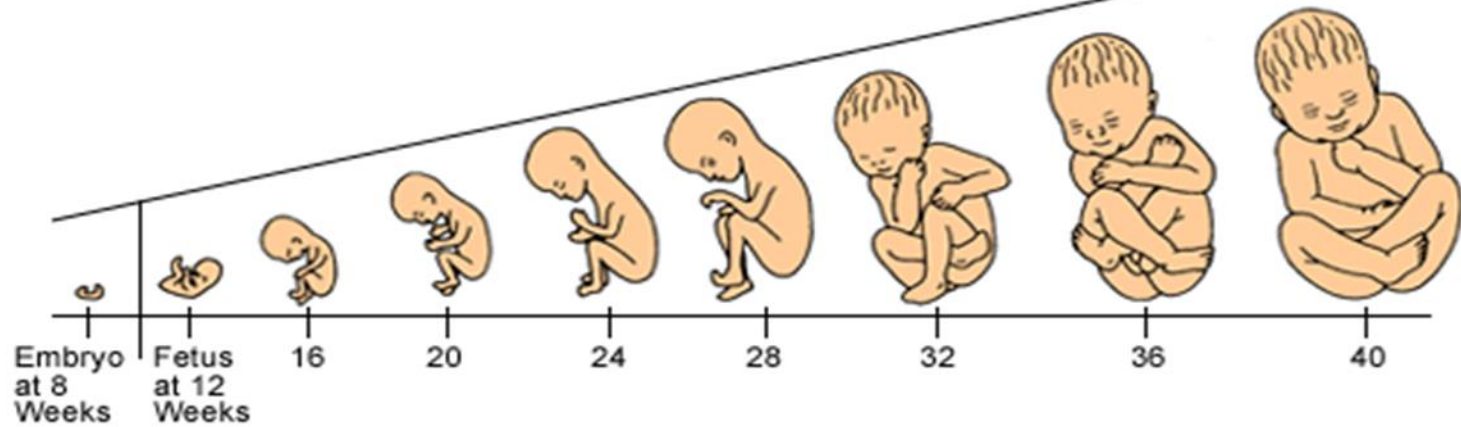
- o *Proximodistal*

- o From those points **close to the body's center** to those points close to the **periphery**

- o Growth – E.g. Prenatal growth

- o Movement Ability – E.g. Infant acquiring motor skill

## Fetal Growth From 8 to 40 Weeks



# General Motor Development Terms

## Movement Differentiation and Integration

- *Differentiation:*

- Progression from gross, immature movement to well-controlled, intentional, precise movement

- E.g. Toddler learning to walk



# General Motor Development Terms

## Movement Differentiation and Integration

### *o Integration:*

- o* Motor systems are able to function together as ability progresses
- o* E.g. See next slide



How does the child in this picture demonstrate the concept of integration?

# General Motor Development Terms

- o *Gross and Fine Movement*

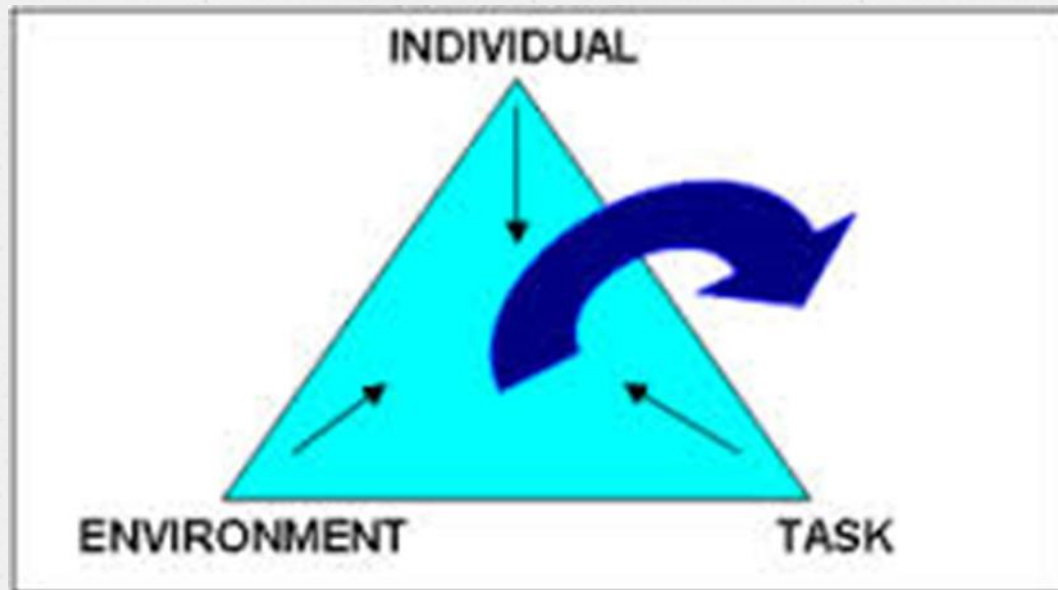
- o *Gross movement*

- o Movement controlled by the large muscles or muscle groups (e.g. legs)

- o *Fine movement*

- o Movement controlled by the small muscles or muscle groups (e.g. hands)

# NEWELL'S MODEL OF MOTOR DEVELOPMENT



## o Individual:

o A person's unique mental and physical abilities that affect their movement

o two types of individual constraints

o Structural: Individual growth patterns and biological make up; e.g. body fat composition or weight

o Functional: Behavioral make up; e.g. Attention span or anxiety

o Task:

- o Rules, goals, and equipment that are used to perform a specific motor task
- o e.g. using a smaller soccer ball for younger children

o Environmental:

- o Social or physical aspects of the environment that affect motor skills;
- o the rowdiness of the fans or poor weather conditions

# A CONSTRAINT

- Is an individual, environmental, or task-goal-related restriction or facilitative channelling of a movement or behavior.

# INDIVIDUAL CONSTRAINTS

- Are a person's or organism's own unique physical and mental characteristics.

# STRUCTURAL CONSTRAINTS

- Are physical constraints related to the body's structure.

# FUNCTIONAL CONSTRAINTS

- Are individual constraints related to behavioral function.

# ENVIRONMENTAL CONSTRAINTS

- Are constraints related to the world around us.

# Stages of Development

- o Common word in human development.
  - o Interchangeable with period, phase, time, or levels
- o Controversy over whether actually exist.
  - o Does life proceed smoothly and continuously?
  - o Is life discontinuous with abrupt behavior changes?
- o Provide manageable portions of information.
  - o But not times of unique, hierarchical, or universal behaviours.

# Interdisciplinary Approach in the Study of Motor Development

- o Three subareas of motor behavior
  - o motor learning
  - o motor control
  - o motor development
- o Working together, experts are able to discern more accurately subtle movement changes and differences.

# Research Designs

Cross-Sectional	Comparison of two or more persons or groups at one point in time
Longitudinal	A study of the same persons or groups over a long period of time
Time-Lag	Different cohorts are compared at different times
Sequential-Cohort	Integrates the cross-sectional, longitudinal, and time-lag designs within one study

# LONGITUDINAL RESEARCH STUDY

- o A study in which the same individual or group is observed performing the same tasks or behaviours repetitively, over a long time

# CROSS SECTIONAL RESEARCH STUDY

- o Is a study in which developmental change is implied by observing individuals or groups of different ages at one point in time.

# SEQUENTIAL, RESEARCH STUDY

- o A study in which several age groups are studied repetitively over a shorter time span
- o permitting observation of an age span that is longer than the observation period.

# Research Designs ~ Pros

Cross-sectional	Administratively efficient Quickly completed Age differences can be observed
Longitudinal	Change can be observed across ages
Sequential-Cohort	Accounts for generational (cohort) effect

# Research Designs - Cons

<b>Cross-sectional</b>	<b>Age and cohort</b> are confounded Assumes changes are due to age Changes may be due to cohort Cannot observe change Difficult to determine appropriate ages
<b>Longitudinal</b>	<b>Age and time</b> are confounded Assumes changes due to age Changes could be due to time Practice may result in inflated scores on successive attempts Administratively inefficient Subjects who perform poorly more likely to drop out
<b>Sequential-Cohort</b>	Administratively inefficient Costly and subjects may drop out Difficult to analyze statistically