Objectives

- Describe some effects of early stimulation.
- Describe some programs to enhance early motor development.
- Describe McGraw's famous twin study involving early stimulation and deprivation.
- Describe some effects of early deprivation.
- Explain the major concepts concerning stimulation and deprivation.

Johnny and Jimmy

- **Purpose:**
  - To determine if a child's normal progress in motor development could be altered by given conditions.

- **Method:**
  - In 1935, two twin brothers were observed for 22 months.
  - Johnny was given toys and stimulation, practice, and experience in movement activities.
  - Jimmy was given few toys and had minimal movement experience.

Johnny and Jimmy

- **Johnny’s Tricycle**
  - 11 months - Johnny given tricycle
  - 19 months – Johnny showed signs of learning
  - 21 months – Johnny mastered tricycle

- **Jimmy’s Tricycle**
  - 22 months – Jimmy given tricycle
  - Shortly after – Jimmy learned skills and mastered tricycle
Johnny and Jimmy

Johnny and Roller Skates
- Less than 1 year - Johnny taught to roller skate and became skillful.
- Hypothesis - Facilitated by low centre of gravity, which enhanced balance.
- 3 years – Problems skating. Balance difficulties.
- Hypothesis – Due to Johnny’s recklessness.

Jimmy and Roller Skates
- 22 months – Began roller skating but never became skilled.
- 3 years – Some problems skating. Balance difficulties.
- Hypothesis – Due to Jimmy’s more cautious nature.

Johnny and Jimmy

Johnny – Slopes and Jumping
- Better skills at ascending and descending slopes.
  - More graceful.
  - Retained ability better.
  - More clever at developing strategies.
- Jumped down from pedestal freely with considerable skill.

Jimmy – Slopes and Jumping
- Less skilled at ascending and descending slopes.
  - Particularly cautious descending slopes.
- Could not be coaxed to jump from pedestal.

Hypothesis: Different experiences at diverse tasks led to differences in attitudes.

Johnny and Jimmy

Johnny - Aquatics
- Early aquatics
  - 17 Months - Abruptly halted
  - 6 Years – Comfortable and skillful
    - Horizontal, coordinated strokes
    - Unusual as no formal instruction

Jimmy - Aquatics
- Early Aquatics
  - 17 Months – Abruptly halted
  - 6 years – Uncomfortable and unskilled
    - Vertical, jerky strokes
**Johnny and Jimmy**

- **Johnny - Socially**
  - Generally, happy and well adjusted.
  - Frequently favored socially.
  - Rorschach Test: More impersonal, self-confident, brave, and unaggressive.

- **Jimmy - Socially**
  - Generally, happy and well adjusted.
  - Would hit Johnny and take his toys.
  - Would express tremendous affection for brother.
  - More dependent on his mother.
  - More prone to temper tantrums.
  - Rorschach Test: More emotionally immature, self-centred, and dependent.

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**Johnny and Jimmy**

- **Myrtle McGraw**
  - Insightful explanations for differences in movement behaviours.
  - Attitude, practice, readiness, physical growth, and level of fixity were all important factors influencing human movement at an early age.

- **Limitations to Study?**

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**Factors Affecting Motor Development**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Johnny - Younger (18 months old). Johnny's performance declined as his readiness improved. He hit his brother.</th>
<th>Myrtle McGraw’s Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>Johnny was more active and expressive than Johnny. Johnny was more reactive and less communicative.</td>
<td>Johnny's performance declined as his readiness improved. He hit his brother.</td>
</tr>
<tr>
<td>Practice</td>
<td>Johnny was more active and expressive than Johnny. Johnny was more reactive and less communicative.</td>
<td>Johnny's performance declined as his readiness improved. He hit his brother.</td>
</tr>
<tr>
<td>Readiness</td>
<td>Johnny was more active and expressive than Johnny. Johnny was more reactive and less communicative.</td>
<td>Johnny's performance declined as his readiness improved. He hit his brother.</td>
</tr>
<tr>
<td>Growth</td>
<td>Johnny was more active and expressive than Johnny. Johnny was more reactive and less communicative.</td>
<td>Johnny's performance declined as his readiness improved. He hit his brother.</td>
</tr>
<tr>
<td>Level of Fixity</td>
<td>Johnny was more active and expressive than Johnny. Johnny was more reactive and less communicative.</td>
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</tr>
</tbody>
</table>
**Effects of Early Deprivation**

- Difficult to study the effects of early deprivation.
  - It is unethical and inhumane to place children in a deprived environment.

- Animal models have provided important information.

- Tragic human cases in society provide additional insight.

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**Hopi cradleboards**

- 1930s: Dennis conducted research on the Hopi tribe.
  - From birth to 1 year of age, Hopi babies were swaddled and tied to a board.
    - Initially - 23 hours/day
    - 3 months - gradually more time off board
  - Position: Legs extended with arms free
    - Babies not permitted typical “infant” movements
  - When free of the board
    - 0-3 months - babies assumed flexed position
    - Longitudinally - infants exhibited the expected movement sequences

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**Early Deprivation**

- Deprivation Dwarfism
  - Caused by early emotional or social deprivation.
  - Also called psychosocial dwarfism or psychosocial short stature.
Early Deprivation

• Deprivation Dwarfism
  – Examples
    • Infants hospitalized for extended periods of time
    • Children not nurtured in a loving and caring environment despite proper and plentiful nutrition
  – Symptoms
    • Listless, apathetic, withdrawn, depressed
    • Respiratory infections, fever
    • Growth slowing/cessation
    • Speech retardation, delayed cognitive abilities
    • Psychomotor delay
  – Removal from environment
    • Symptoms disappear
    • Catch up may occur to varying degrees

Early Deprivation

• Anna
  – A victim of severe deprivation due to isolation (1946).
  – Left in an attic room until six years of age.
  – When discovered she showed signs of minimal intelligence, could not walk or talk, and was extremely malnourished.

Early Deprivation

• Anna
  – By the age of 10 years, Anna was able to walk and run clumsily, string beads, but did not speak in complete sentences.
  – Died at age 11 years.
Early Deprivation

- Young Savage of Abeyron
  - Victor, a young boy found in the woods of France in 1799 at 11-12 years of age.
  - He could not talk, trotted rather than walk, chewed like a rodent, and was intellectually delayed.
  - Despite attempts to remediate, he showed little improvement intellectually and died at 40 years of age.

"Wild boys' saga turns out to be hoax by 2 brothers Urban brothers spin tales of wilderness life."
M. Taylor & G. Lucas
San Francisco Chronicle Saturday, April 3, 2004

- Two brothers who said they were born and raised in the Canadian wilderness appear to be two brothers who were born and raised in urban California and left their home near Sacramento only last summer...
- http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2004/04/03/MNGIQ609LL1.DTL

Stimulation & Deprivation Concepts

- Critical periods
  - Times of particular or maximum sensitivity to environmental stimuli.
  - If a child is stimulated during the sensitive period, the associated behavior is likely to occur.
  - Periods occur at specific times in a person’s life.
  - For many skills, if critical period bypassed, skill may be learned, but will never be developed at master level.
Stimulation & Deprivation Concepts

• Critical periods – Natural Cases
  – **Left hemisphere** of brain damaged during infancy (before language developed)
    • Right hemisphere substitutes for language development
  – **Left hemisphere** of brain damaged during childhood (after language developed)
    • Person will never be able to speak fluently
    • Critical period for right hemisphere substitution passed

Stimulation & Deprivation Concepts

• Four essential elements of critical periods
  1. **State of readiness** must be attained by the individual in order for the environmental stimulation to be effective.

  2. There is a **specific time limit**.
    • Appropriate stimulation must occur during a specific time for optimal development.

Animals imprint on parents and will follow them. Here is Konrad Z. Lorenz who demonstrated that incubator-hatched geese would follow the first moving stimulus within the critical period.

https://en.wikipedia.org/wiki/Imprinting_(psychology)
Stimulation & Deprivation Concepts

• Readiness
  – The establishment of the **minimum characteristics** necessary for a particular human behavior to be acquired.
  – Depends on an adequate level of physical growth, associated **neurological patterns**, and sufficient **motivation**.

• Example: Tri-cycling skill in the twins Johnny and Jimmy.
  • Early experience with a particular skill before a child is “ready” may not be valuable.
  • Some researchers disagree (Bruner, 1976)
    • Children are **always ready to acquire a new behaviour**, the key is finding appropriate stimuli.
  • Signs for readiness are **unrecognizable at present**.
    • Can only estimate most appropriate time for exposing child to movement experiences and instruction.

Stimulation & Deprivation Concepts

• Catch-up
  – The human power “to stabilize and return” to a genetically determined growth path “after being pushed off trajectory”.
  – Can occur in **physical growth and motor, intellectual, social, and emotional development**.
  – **Severity** of the deprivation determines the degree of catch-up.
Stimulation & Deprivation Concepts

- Example of a child’s catch-up growth following a period of severe nutritional deprivation.

Questions

- Can overstimulation occur?
- Is deprivation ever in the child’s best interest?
- When are the best times for stimulation or the worst times for deprivation?
- Is stimulation worthwhile for the acquisition of all human behaviors?
- Are there some behaviors that cannot be facilitated by early exposure to stimulating experiences?