Human Development

Learning objectives

After the completion of Lecture #1, students should be able to:
1. Describe the important milestones of human development;
2. Describe the causes and possible risk factors related to developmental dysfunction.

Patterns of human development

Human development is a continuous process in a person’s life from conception to death (i.e., the life span approach). It proceeds stage by stage in an orderly biological and psycho-social sequence, despite some individual variations. It is also the interaction of environment (i.e., the human and non-human factors) and heredity that leads to the nature-nurture controversy or maturation-experience debate.

1. Cephalocaudal
The cephalocaudal pattern is the growth sequence occurs at the top (i.e., the head) with function differentiation gradually working its way down from top to bottom. The same pattern also occurs in the head area because the top part of the head (e.g., eyes) and the brain grows faster than its lower parts (e.g., the jaw).

2. Proximodistal
The proximodistal pattern is the growth sequence starts at the center of the body and moves towards the extremities. An example of this is the early maturation of muscular control of the trunk and arms as compared with that of hands and fingers.

3. Asymmetric-symmetric
The asymmetric-symmetric pattern is the sequence in which newborns begin life asymetrically with the head turned to one side, gazing at one hand, and become more symmetric around the fourth month of life (e.g., the midline orientation of hands and the bilateral coordination of extremities).

4. Gross motor to fine motor
The maturation of muscle control is from gross motor to fine motor function.

Patterns of play behaviour (Social component)

Six levels of children’s play behaviour (in priority):
1. Unoccupied (The first 12 months)
   - Playing with one’s own body; explore the sensory input from the environment

2. Solitary play (Age: 1-2)
- Interested in individual play, not interested in playing with others

3. **Onlooker**  (Age: 2-3)
   - Just watch others playing but not entering into the play situation

4. **Parallel play**  (Age: 3-4)
   - Playing with toys with the presence of other children within speaking distance; playing independently beside, but not with others, may share toys with other children

5. **Associated or associative play**  (Age: 4-7)
   - Play in a group situation with some spontaneous interaction with other children, the group play activity is not well-organised

6. **Co-operative play**  (i.e., obey rules and team work)  (Age: 7 and above)
   - The group is organized to achieve some goal; highly organised group play activity

**Object play (Cognitive component): the ability to play with objects**

12 months (range: 7-21 months)

**Presymbolic → Symbolic play**  (able to use imagination in play behaviour)
   - Decentration (from self to others and have more awareness of the environment)
   - Decontextualization (use imagination to play with one or more toy objects)
   - Integration (e.g. perform different roles in a role play and pretended play)

The transition period is the age of 7-21 months and when children are engaged in symbolic play, they can use imagination to play with one or more toy objects. The children can also perform different roles such as mother, father, teacher and other persons in life and have a theme in the pretended play.

7-18 months

**Single object → play with more than one toy objects**

9-12 months

**Indiscriminate → Discriminate**
   - Able to be aware of the unique properties of the toy objects (e.g. toy cars, toy house)

**Types of newborns' temperament**

Temperament is an individual’s behavioural style and particular way of responding to the environment (including the sleeping pattern). It is clear that newborns’ behaviours affect the
relationship (bonding or attachment) with their parents (i.e., the main caregivers).

Lefrancois (1988) divided children into four basic types of temperament as follows:

1. Easy children - They have regular sleeping and eating schedules (biological regular and rhythmical), accept new experiences (i.e., new food, new people, etc.), are not easily frustrated and generally are in a positive and stable mood.

2. Difficult children - They engage in irregular daily routines and they often withdraw from new stimuli, adapt very slowly to change; their mood is often negative and they cry frequently.

3. Slow-to-warm-up children - This group of children show interest in new situations only if they are allowed to do gradually, without pressure. They often have low activity level and display low intensity of mood.

4. Varying mixtures - They show combinations and variations of the described patterns.

**Newborns’ sleeping pattern**

<table>
<thead>
<tr>
<th>Brazelton (1984)</th>
<th>Other term(s)/ Description(s)</th>
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</thead>
<tbody>
<tr>
<td>State 1 – Deep sleep</td>
<td>Quiet sleep</td>
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<tr>
<td></td>
<td>Non rapid eye movement sleep (Non REM sleep)</td>
</tr>
<tr>
<td></td>
<td>Regular sleep</td>
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<tr>
<td>State 2 – Light sleep</td>
<td>Active sleep</td>
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<tr>
<td></td>
<td>Rapid eye movement sleep (REM sleep)</td>
</tr>
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<td></td>
<td>Irregular sleep</td>
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<tr>
<td>State 3 – Drowsy</td>
<td>Transitional state</td>
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<tr>
<td>State 4 – Quiet alert</td>
<td>Awake but remain quiet and pay attention to the environment</td>
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<tr>
<td></td>
<td>The caregiver can try to interact with the child</td>
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<tr>
<td>State 5 – Active alert</td>
<td>Awake and want to explore the environment (e.g. interaction with the caregiver); this is the best opportunity to interact with the child</td>
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<tr>
<td>State 6 – Crying</td>
<td>Disturbed by external or internal stimuli</td>
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Psycho-social development

Stranger Anxiety
Babies become shy and fearful in the presence of strangers when they are about 6 months old. Stranger anxiety is a milestone of social and emotional development when children learn to identify their parents or the caregiver as a source of comfort and security. Stranger anxiety continues through the rest of the first year and much of the second year, with varying degree of intensity till the age of 5-6 years old.

The process of the separation anxiety: protest, despair and detachment (in priority)

Young children do not want to be separated from parents or the caregiver and would experience intense distress and sense of insecure. Separation anxiety usually begins at the age of 6 months old and the peak is at the age of 2 years old.

1) Protest – The children show great distress, calling, screaming and crying for the absent caregiver, and some appear panic-stricken. Anger and fear are evident. The protest behaviour may last for hours to 1-2 days till the return of the caregiver.

2) Despair – The children become calmer but apathetic as they show little interest in anything. Self-comforting behaviour is observed such as thumb sucking, curling up or rocking the body. Crying persists, less angry, more pitiful and the children stop eating and refuse to talk or play. The despair may last for days.

3) Detachment – The children proceed from the acute separation reaction to a state in which they will eat, talk and play. They appear to cope with the separation as they show more interest in their surroundings, but they are emotionally unresponsive. The children may avoid interaction when the caregiver returns, but most children are able to re-establish the relationship over time. Some children will develop new attachment relationship with others in the new environment for survival.

Social and emotional problems
Small children do not typically verbalize feelings and it must be assessed primarily from behavioural observation. They are more likely to present with somatic complaints and anxiety or behavioural disturbance.

Disorder of attachment behaviour

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Signs of disorder</th>
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<tbody>
<tr>
<td>Showing affection</td>
<td>Lack of warm and affectionate interchanges across a range of interactions with the caregiver</td>
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<tr>
<td>Comfort seeking</td>
<td>Lack of comfort seeking behaviour or comfort seeking behaviour in odd manner from the caregiver</td>
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<tr>
<td>Reliance for help</td>
<td>Excess dependence or inability to seek for help from the caregiver</td>
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<td>Cooperation</td>
<td>Lack of compliance or having compulsive behaviour</td>
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<td>Reunion responses</td>
<td>Failure to re-establish interaction after separation with the caregiver, including ignoring/avoiding behaviour, intense anger and/or aggressive behaviour and/or lack of affection</td>
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**Possible reasons for challenging behaviour of children**

- Access to a material reinforcer
- Access to a social reinforcer
- Avoidance of aversive stimulus
- Sensory stimulation (e.g. self-stimulatory behaviour and/or self-injurious behaviour)
- Emotional problems (e.g. aggressive behaviour and/or self-injurious behaviour)

**Four common parental attitudes** (Wolfensberger, 1983):

1. **“Somebody else is responsible for my child”**
   Parents always blame professionals for the difficulties in accepting and/or providing care for the child.

2. **“The my child syndrome”**
   Parents might become too demanding and/or sometimes might appear not quite reasonable when they interact with professionals. They only focus on the needs of their child and ignore the others.

3. **“My situation is unique”**
   “My situation is very unique”. “My child is also unique” that “my child is different from all other children”. Parents might feel hopeless and helpless in providing care for their child with developmental disabilities.

4. **Expecting too much or too little**
   Parents expect either too much or too little from the child with developmental disabilities, or perhaps too much in one area and too little in another.

Although most families accept their child and his or her developmental disabilities early on, parents still face with challenges and stressors that are associated with raising a child with developmental disabilities. Therefore, adaptation is a dynamic and ongoing process, beginning with the birth and the subsequent diagnosis and throughout the whole life span of the child concerned.
Types of parents: interaction with professionals (Gascoigne, 1995):

• **Assertive and educated parents**
  - Confident when speaking with professionals and want to be involved in the intervention process
  - Open and assertiveness in the discussion process
  - Not always agree with the professionals

• **Angry and educated parents**
  - Often start their conversations with a challenge
  - Angry if their own knowledge is questioned
  - Angry about the insufficient care and “expert” ability of the professionals
  - May behave as if not cooperative

• **Submissive parents**
  - Have confidence in handling the needs of their child
  - Wait for the professionals to guide and direct them
  - May be passive in the intervention process

• **Uncaring parents**
  - Low expectation of their child within the school setting or in life
  - Leave the responsibilities to professionals
  - Passive in the intervention process

• **Angry and ill-informed parents**
  - Behave in a confrontational manner
  - May misunderstand the nature of their child’s difficulties
  - Confused about the service provision and the roles of different professionals

**Causes of developmental dysfunction**

Definition of developmental dysfunction: a group of disabilities begins with the child’s birth and extends across the life span.

1. **Genetic abnormalities**
   - Dominant gene – (e.g. Huntington disease, Achondroplasia) [http://www.hda.org.uk/](http://www.hda.org.uk/)
     Huntington disease causes progressive deterioration of the central nervous system, causing jerky involuntary movements (i.e., chorea) and mental deterioration.

   - recessive gene – (e.g. Phenylketonuria, Glucose Galactose Malabsorption) [http://www.medhelp.org/lib/pku.htm](http://www.medhelp.org/lib/pku.htm)
     The disease causes phenylalanine (a kind of water-soluble amino acid) to build up to a dangerous level in a child’s blood and spinal fluid, causing deterioration in cognitive functioning.
Chromosomal abnormalities
- Down syndrome (46 + 1 chromosomes)
  - William syndrome (deficits in Chromosome 7)
  - Turner syndrome (i.e., only a single X chromosome; affects only females)

Multifactorial
- Congenital heart disease
- Cleft and/or lip palate

2. Maternal characteristics
- Mother’s age (i.e., the older the age, the higher the chance to have children with developmental dysfunction)
- Nutrition and emotional state (i.e., poor nutrition and depressive mood affect the development of an embryo)
- Maternal disease and infection (e.g., diabetes, hypertension, heart disease, Rubella or German measles, HIV/AIDS, Systemic Lupus Erythematosus)

3. Intoxication (e.g. teratogens, drugs, medication)
- Teratogen: any agent that causes malformation of an embryo or a fetus: lead, mercury, alcohol, tobacco, radiation, pollution

4. Prenatal, peri-natal and post-natal care (e.g. encephalitis, meningitis, measles, trauma, child abuse, accidents)

5. Delivery complications
- Precipitate delivery: too rapid delivery less than 10 minutes
- Breech delivery: the baby’s feet come through the vagina first and the delivery may become too long
- Too long delivery can cause anoxia or apnea, resulting brain damage (e.g. cerebral palsy)

6. Metabolic disorders (e.g. neonatal jaundice, thyroid dysfunction, malnutrition)

7. Gestational disorders (e.g. very low birth weight, pre-maturity, microcephalus, hydrocephalus)

8. Environmental factors (e.g. limited stimulation, cultural deprivation)
- Children living in disadvantaged environment may be deprived of the cultural and day-to-day experience for normal development. Research suggests that under-stimulation can result in delayed development to the brain.

9. Unknown reasons (about 70%)
Possible risk factors of developmental dysfunction
Risk refers to internal and/or external factors that will increase the likelihood of certain, usually undesirable outcomes.

1. Abnormal physical growth and development (i.e., all performance components)
2. Poor relationship with family (e.g., poor attachment with significant others)
3. Poor academic performance (e.g., high chance of school drop-out)
4. Psycho-social disorder (e.g., low self-esteem, poor social skills)
5. Challenging behaviour: any behaviour that limits a person’s social integration. The examples of challenging behaviour include:
   - self-injurious behaviour: any behaviour that inflicts physical damage to the individual’s own body;
   - aggressive behaviour: a response that produces physical injury to other people’s bodies or damage to the environment;
   - self-stimulatory behaviour
6. Social isolation (having no social network such as friends, co-workers)
7. Institutionalization (dependent and need to stay in institution the rest of the life)
8. Unemployment (unable to attain and maintain employment)
9. Poverty (poor financial support and live below poverty level)

Protective factors
Protective factors are the characteristics that a child and/or family bring to a situation that will actually shield their responses to risk or stress. There are three types of protective factors:

1. characteristics of the child (e.g. easygoing temperament, positive personality, affectionate behaviour, peer support and acceptance);
2. characteristics of the family system (e.g. warmth and nurture where trust, exploratory behaviour and independence are facilitated; coping style; personal and family resources);
3. Environmental support system (e.g. education and rehabilitation services provided by society; community resources, public education).

Both possible risk factors and protective factors would affect a person’s overall occupational performance and community integration. As occupational therapists, we need to understand the impact of possible risk factors and protective factors on people with developmental disabilities and their families.

Reference