



JCDISI Season 9: Children's Well-being in Subdivided Units Co-creation Workshop 20 Nov 2020

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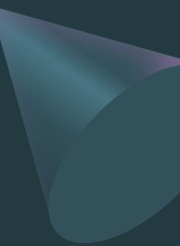
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Child Development



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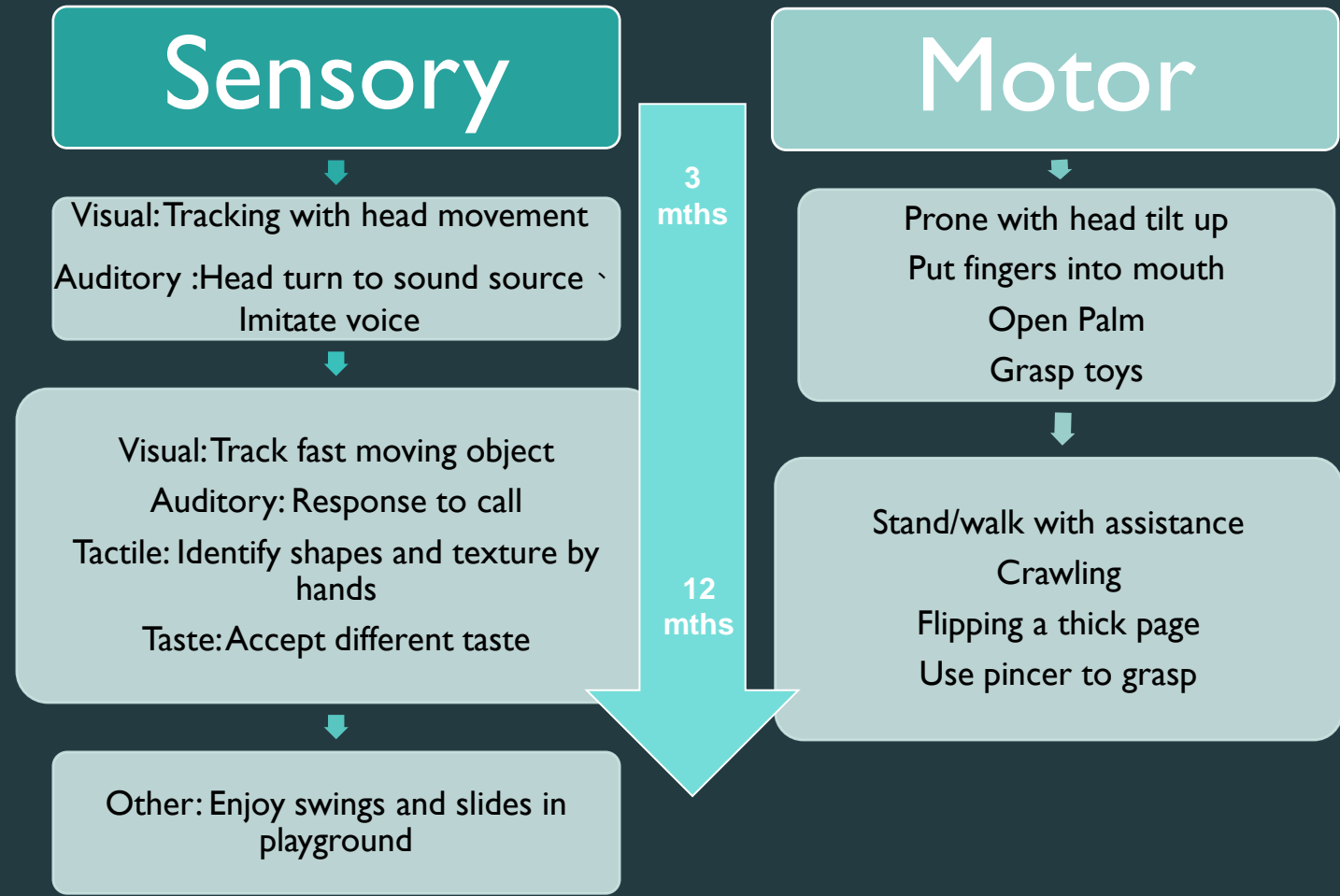


Piaget's Stages of Cognitive Development

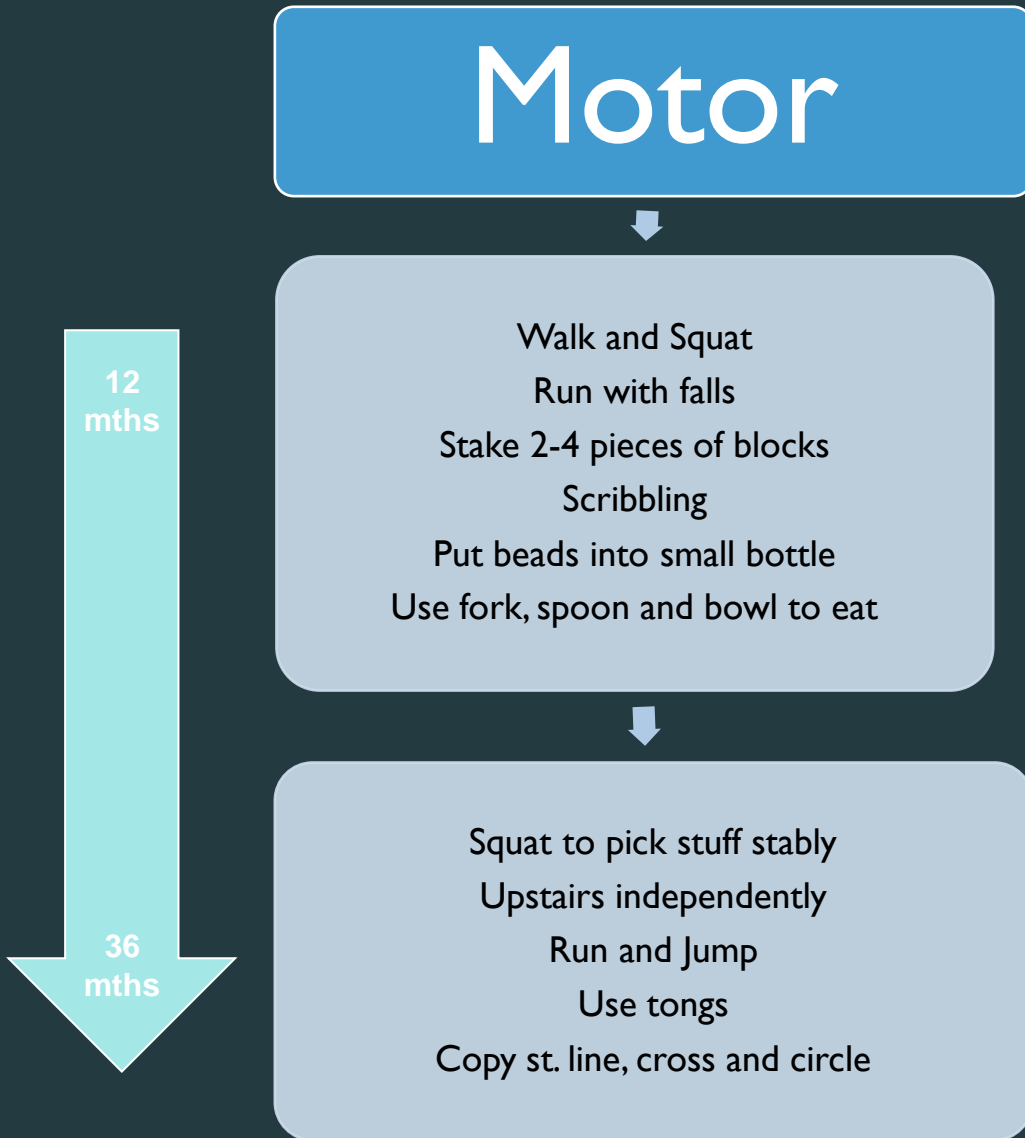
Sensorimotor Stage (0-2 years old)	Learning occurs through interaction, specifically senses and motor skills, with the physical environment.
Preoperational Stage (2-7 years old)	Child begins to use symbols, conceptualization of time (present, past, and future) and the progression from centrism to de-centrism; At this stage, the child is egocentric.
Operational Stage (7-11 years old)	Child begins to relate to information logically. Child demonstrates conservation and reversibility.
Formal Operational Stage (11-15 years old)	Child demonstrates the ability to engage in abstract thinking, using skills such as deductive and hypothetical reasoning.

(Jansen, 2011)

Sensorimotor Development



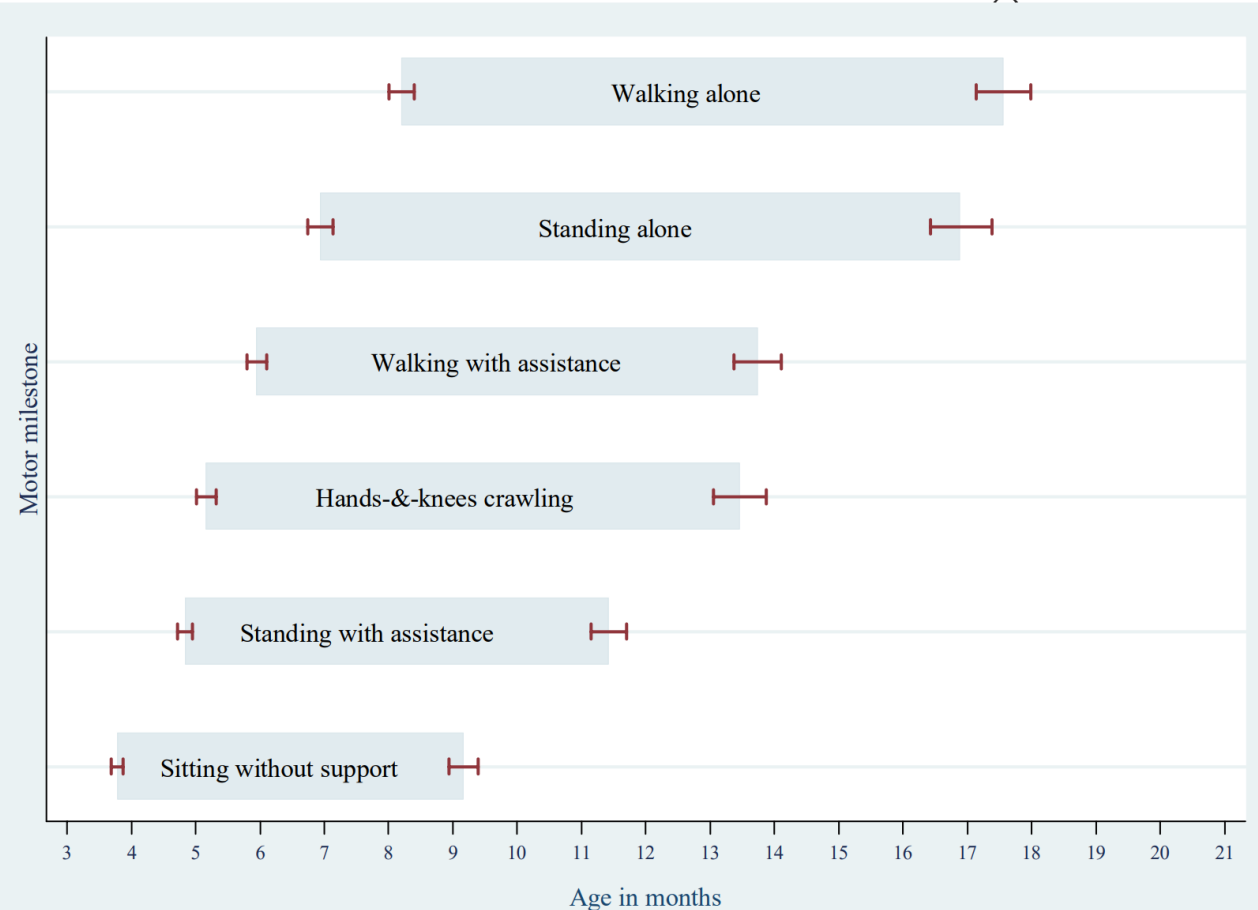
Sensorimotor Development



Gross Motor Development

(WHO Multicentre Growth Reference Study Group, 2006)

Windows of achievement for six gross motor milestones



Reference: WHO Multicentre Growth Reference Study Group. WHO Motor Development Study: Windows of achievement for six gross motor development milestones. Acta Paediatrica Supplement 2006;450:86-95.

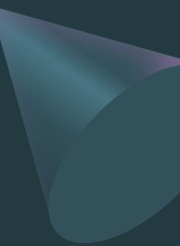
Developmental Characteristics of Children Aged Two to Six

Age	Physical Development	Intellectual Development	Language Development	Emotional and Social Development
2 to 3 years	<p>Gross Motor:</p> <ol style="list-style-type: none"> 1. Able to walk with ease, pull and push objects while walking or step backwards. 2. Need to rest both feet on one step in going up stairs; need help initially, but can gradually do it on their own without assistance. 3. Able to jump from one stairstep, but prone to injury. 4. Try to kick a ball. Initially only walk up and touch it with foot; gradually able to kick properly. 5. No sense of direction when throwing a ball, but can throw the ball into a basket in front of them later. 6. When riding a tricycle, move forward only by pushing with feet on the ground; can control the direction with hands later. <p>Fine Motor:</p> <ol style="list-style-type: none"> 1. Able to unwrap candies. 2. Able to turn pages of a book. 3. Able to unscrew the cap of a bottle. 4. Able to stack blocks. 	<ol style="list-style-type: none"> 1. Able to learn to match colours, shapes, objects and sizes. 2. With repeated attempts, able to stack 5 rings onto a stick in order of their size. 3. Able to assemble puzzles of 3 to 5 pieces. 4. Know their own names. 5. Know the names and functions of major body parts. 6. Able to identify daily objects by touch. 7. Begin to understand the meaning of 'one' and 'two'. 8. Begin to show memory, like suddenly remembering some favourite objects and then searching for them. 9. Enjoy role play, such as pretending to be a doctor/teacher, etc. 	<p>Language Comprehension:</p> <ol style="list-style-type: none"> 1. Able to follow simple instructions, or point to a number of body parts. 2. Able to understand common nouns, verbs and adjectives. <p>Language Expression:</p> <ol style="list-style-type: none"> 1. Able to express with limited words and short sentences. 2. Able to ask "What?" questions. 3. Able to imitate longer sentences when singing along with nursery rhymes. 	<ol style="list-style-type: none"> 1. Not yet ready to share toys with peers. 2. Able to take turns with peers under adult's instruction. 3. Become jealous easily towards peers who take away adult's attention from them. 4. Lose temper easily when frustrated, yet also forget about unhappy experiences easily when attention is distracted. 5. Like to follow routines, dislike changes. 6. Begin to show preferences for food. 7. Like to be praised, prefer pretty clothes. <p>Self-Care:</p> <ol style="list-style-type: none"> 1. Know how to express toilet needs, able to go to the toilet on their own when prompted, but still occasionally wet their pants during the day. 2. Able to wash their hands with assistance. 3. Able to put on/ pull down their pants, take off their clothes, shoes and socks.

Age	Physical Development	Intellectual Development	Language Development	Emotional and Social Development
4 to 5 years	<p>Gross Motor:</p> <ol style="list-style-type: none"> 1. Able to jump forward and backward, hop on one leg and skip forward. 2. Able to pick up objects on the ground while running. 3. Able to throw and catch a bean bag. 4. Able to walk on a balance beam. 5. Able to throw a small ball. 6. When swimming, able to walk in shallow water or float with floaters. 7. Play confidently on slides, climbing frames and swings. <p>Fine Motor:</p> <ol style="list-style-type: none"> 1. Able to thread small beads. 2. Able to draw a square. 3. Able to draw simple pictures such as people, houses, trees, cars, etc. 4. Able to fold a piece of paper diagonally. 5. Begin to do artwork with cutting and gluing. 6. Able to cut a simple shape. 7. Able to secure several pieces of clay together. 	<ol style="list-style-type: none"> 1. Able to distinguish between living things (e.g. cat, dog, tree) and non-living things (e.g. toy, cup and plate). 2. Able to match furniture with the room where they belong. 3. Able to point out the odd one from a group of objects. 4. Able to assemble puzzles of 8 pieces. 5. Able to identify things and what's happening by sound. 6. Able to imitate the sounds of animals. 7. Able to draw a man with head, body, limbs and facial features. 8. Begin to understand the concept of time, able to tell what they usually do in the morning, afternoon and evening. 9. Begin to understand position and speed, e.g. able to distinguish front and back, fast and slow, middle, the first and the last, etc. 10. Pay attention to the environment, able to point out the missing or inconsistent part in a picture. 11. Able to identify simple and common signs, like road and shop signs. 12. Able to recite from 1 to 20. 13. Able to count 1 to 10 objects correctly. 14. Able to recall 4 things in a picture they have just seen. 15. Able to tell which of the 3 objects just seen are missing. 16. Able to read simple words. 17. Able to single out a word of different nature, e.g. "cow, goat, dog, car". 	<p>Language Comprehension:</p> <ol style="list-style-type: none"> 1. Begin to understand the difference between "past" and "present". 2. Able to carry on a simple conversation over phone. <p>Language Expression:</p> <ol style="list-style-type: none"> 1. Able to talk about everyday life experiences. 2. Begin to express themselves with complex or longer sentences. 3. Able to tell stories from picture sequence. 4. Able to use words like "because", "therefore", "some", "several", "many" appropriately in conversation. 5. Able to use opposites / complementary words and phrases. 6. Able to tell the names of their family members, the district they live in. 7. Able to tell the colour of a particular object, like, banana is yellow. 8. Able to talk about people of different occupations and their responsibilities. 9. Like to ask questions and seek explanations for things they do not understand. 10. Begin to ask "why", "when" and "how" questions. 11. Able to solve simple riddles like: "I have four legs, a tail, like to eat fish and can catch mice, what am I?" 12. Able to speak fairly fluently and clearly. 	<ol style="list-style-type: none"> 1. Able to be self-disciplined and stay within a confined area even without adult's supervision. 2. Willing to observe game rules when playing with other children. 3. Able to take care of younger children and pets and console their playmates who feel upset. 4. Have vague concepts of right and wrong, only know that they will be punished for bad behaviour and praised for good behaviour. 5. Know how to say "thank you", "sorry". 6. Able to hold a conversation with strangers at ease. 7. Able to help in simple chores at home. <p>Self-Care:</p> <ol style="list-style-type: none"> 1. Start to eat with chopsticks under guidance. 2. Able to help clean up the dinner table after meals. 3. Able to clean up dirt with a piece of cloth. 4. Able to wash and dry their hands and faces by themselves. 5. Learn how to brush teeth and clean nose by self. 6. Able to get up and go to the toilet at night with no bedwetting. 7. Begin to dress and undress themselves.



Possible impact on child development



Sensory/ Motor development



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The physical indoor environment in ECEC settings: children's well-being and physical activity

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(Sando, 2019)

Table 3. Multilevel model of well-being and PA in the indoor environment.

Predictors (fixed effects)		Physical activity	Well-being
Constant		2.3	3.4
Background	Age	.008	-.048
	Boy	.034	-.023
Context	Playing	.000	.007***
	With Children	.001	.001
	Adult Present	-.002**	-.001
Place	Open Floor Space	.004**	-.001
	Low Tables	-.003*	-.002
	High Tables	-.004*	-.003*
	Cubbies	.005**	.001
	Rooms for PA	.017***	.004*
	Tumbling Zone	.013***	.001
	Play Zone	.002	-.002
Model statistics (including random effects)			
Observation level	Sample Size	479	479
	Residual Variance Empty Model	.493	.294
	Residual Variance Full Model	.318	.240
Child level	Sample Size	80	80
	Residual Variance Empty Model	.086	.109
	Residual Variance Full Model	.044	.077
Variance at the child level (%)		15%	27%
Goodness of fit -2LL (empty – full model)		220***	105***

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Sensory/ Motor development

- Sensory exposure for infants
- Space/equipment/tools for sensorimotor activity at home (e.g. Rice/ water; climbing/ jumping/ bubble bathing)
- Space for building strength, coordination and movement patterns (e.g. crawling, hopping, skipping etc.)
- Space for stretching
- Commonly used posture in SDU: Sit/ squat/lying
 - Spine development- flexion posture, posterior pelvic tilt

Play

- Stimulating environment for play development
 - Symbolic play
 - Socio-dramatic play
- Limited play skills on toys / with peers (Noise, space for gross play)
- Toys for stimulation



Activity of Daily Living (ADL)

- Shared bathroom, limited space/privacy
- Independence in bathing, toileting, grooming tasks
- Due to time schedule, privacy and safety?
- Limited space for some Instrumental ADL tasks
 - E.g. Ironing clothes, laundry

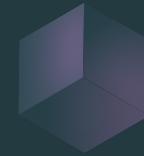
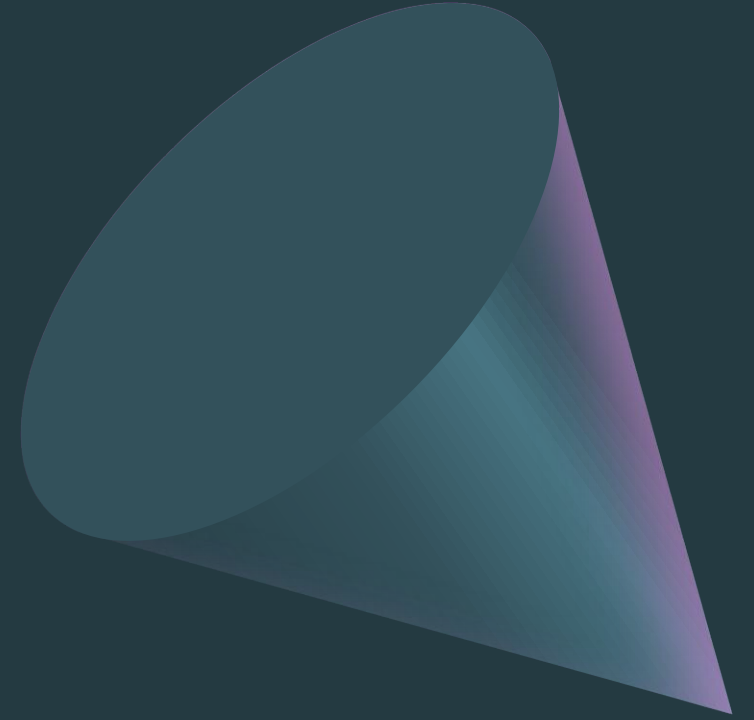


Education

- Desk and chair? Ergonomics?
- Proper surface for writing, reading, craft works, play



Factors affecting the severity of impact



Other factors

- Age when living in SDU
 - infants- more influence- Sensory development/ Space for movement and exploration→ Foundation for many many skills' development
 - Toddler: space for movement, movement pattern limitation
 - School age: Gross motor skills jumping/ball skills etc
- Daily routine- compensation for the inadequacy
- Size of the SDU
- Parents/Family Involvement – motivation/ availability/ ability
- Neighborhood/ flat owner attitude

Our Input

Software

Sensory/ motor tasks recommendation for facilitating the development in the environment with limited space

Daily living routine restructure/ Lifestyle Redesign

Workflow/ task flow rearrangement

Parent's education on child developmental needs

Hardware

Home modification- furniture or spatial re-arrangement/ furniture ergonomics

Participate in furniture design- maximize the occupations provide by the furniture

Toys recommendation/ participate in toys design

Prescription of aids for writing/reading/other functional tasks

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