State Medical University

Developmental Assessment of Young Children

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Introduction

- This work presents an overview of the development of intellectual abilities. Children are not little adults. Until they reach the age of 15 or so they are not capable of reasoning as an adult. The following information is based on the work of Jean Piaget. He was not a psychologist. He was a developmental biologist who devoted his life to closely observing and recording the intellectual abilities of infants, children and adolescents.

The stages of intellectual development formulated by Piaget appear to be related to major developments in brain growth. The human brain is not fully developed until late adolescence or in the case of males sometimes early adulthood. We often expect children to think like adults when they are not yet capable of doing so. It is important that parents know what to expect from their child as they develop and to be sure that the expectations they may have for their child at a given age are realistic.


Piaget's Stages of
Cognitive Development
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Sensory Motor Period (0 - 24 months)

Developmental Stage & Approximate Age	Characteristic Behavior
Reflexive Stage (0-2 months)	Simple reflex activity such as grasping, sucking.
Primary Circular Reactions(2-4 months)	Reflexive behaviors occur in stereotyped repetition such as opening and closing fingers repetitively.
Secondary Circular Reactions (4-8 months)	Repetition of change actions to reproduce interesting consequences such as kicking one's feet to more a mobile suspended over the crib.
Coordination of Secondary Reactions (8-12 months)	Responses become coordinated into more complex sequences. Actions take on an "intentional" character such as the infant reaches behind a screen to obtain a hidden object.
Tertiary Circular Reactions (12-18 months)	Discovery of new ways to produce the same consequence or obtain the same goal such as the infant may pull a pillow toward him in an attempt to get a toy resting on it.
Invention of New Means Through Mental Combination (18-24 months)	Evidence of an internal representational system. Symbolizing the problem-solving sequence before actually responding. Deferred imitation.

The Preoperational Period (2-7 years)

Developmental Stage & Approximate Age	Characteristic Behavior
Preoperational Phase (2-4 years)	Increased use of verbal representation but speech is egocentric. The beginnings of symbolic rather than simple motor play. Transductive reasoning. Can think about something without the object being present by use of language.
Intuitive Phase (4-7 years)	Speech becomes more social, less egocentric. The child has an intuitive grasp of logical concepts in some areas. However, there is still a tendency to focus attention on one aspect of an object while ignoring others. Concepts formed are crude and irreversible. Easy to believe in magical increase, decrease, disappearance. Reality not firm. Perceptions dominate judgment. In moral-ethical realm, the child is not able to show principles underlying best behavior. Rules of a game not develop, only uses simple do's and don'ts imposed by authority.

Early Social Emotional Development

1. Nature and nurture combine to define who we are as individuals.
2. Nature has provided humans with what some scientists call early infant competencies or motivations.
3. Babies are born to connect with other humans.
4. Babies discriminate sounds of language very early.
5. Babies recognize their parents' voices.
6. Babies can match emotional voice tone to emotional facial expression.
7. Babies prefer looking at faces.
8. Babies seek physical and emotional equilibrium.
9. Babies are predisposed to signal their needs to someone who will help them survive.
10. Babies are an emotional trigger for adults.
11. Babies are born with the desire to master and explore their environment and are active participants in their own learning.
12. The infant's early brain development is designed to connect the newborn with other human beings around him who will provide care.
13. The brain grows through the experiences the infant has with the world. Parents and other important adults are that world

14. The family's culture influences all areas of a baby's development, including the social emotional realm.

15. Many factors can affect social emotional development, including developmental delays or serious health issues with the baby, or an environment with multiple risk factors (ex. poverty, substance abuse, adult mental health issues, domestic violence)

16. The baby's communication of emotions and needs establishes the learning pathways in the brain that lead to all other physical, cognitive, and emotional learning.

Early mental health or early social emotional wellness is the developing capacity of the child from birth to 3 to: experience, regulate, and express emotions: form close and secure interpersonal relationships; and explore the environment and learn- all in the context of family, community, and cultural expectations for young children.

- **Developing capacity** is a reminder of the extraordinarily rapid pace of growth and change in the first 3 years of life
- Infants and toddlers depend heavily on adults to help them **experience, regulate, and express emotions**
- Through **close, nurturing interpersonal relationships** with parents and other caregivers, infants and toddlers learn what people expect of them and what they can expect of other people

- The drive **to explore and master one's environment** is inborn in humans. Infants' and toddlers' active participation in their own learning and development is an important aspect of their mental health.
- The context of **family and community** is where infants and toddlers learn to share and communicate their feelings and experience with significant caregivers and other children. They develop a sense of themselves as competent, effective, and valued individual.
- **Culture** influences every aspect of human development, including how infant mental health is understood, adults' goals and expectations for young children's development, and the child rearing practices used by parents and caregivers.

Three Major Elements of Social Emotional Wellness in Infancy

I. Forming close and secure relationships

II. Experiencing, expressing, and regulating emotions

III. Exploring the environment and learning

Regulation and Stress in Young Babies

Signs of Regulation	Signs of Stress
1. Regular, even breathing; warm body temperature; even skin color.	1. Yawning, drooling, hiccupping; chilled or clammy; pale or blotchy skin.
2. Good muscle tone; can lift arms and legs against gravity.	2. Poor muscle tone; flails arms and legs loosely or cannot pull up against gravity; trembling.
3. Moves easily (with little comforting) between being awake and being asleep; when awake, is sometimes quiet and alert, sometimes active and alert; can become calm when crying.	3. Awakens screaming; cannot relax to fall asleep or falls asleep suddenly in the midst of noise and commotion; has trouble focusing when awake.
4. Startles briefly at loud noises but recovers; tolerates handling even during diaper changes.	4. Startles at noise, light, and touch, and cannot recover.

Temperament. Temperament Traits.

- Appears to be biologically based
- Fairly constant over time
- Affects a child's reactions to other people and the environment

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- **Activity level** – always active or generally still
- **Biological rhythms** – predictability of hunger, sleep, elimination
- **Approach/withdrawal** – response to new situations
- **Mood** – tendency to react with positive or negative mood, serious, fussy
- **Intensity of reaction** – energy or strength of emotional reaction
- **Sensitivity** – comfort with levels of sensory information; sound, brightness of light, feel of clothing, new tastes
- **Adaptability** – ease of managing transitions or changes
- **Distractibility** – how easily a child's attention is pulled from an activity
- **Persistence** – how long child continues with an activity he/she finds difficult





Temperament Types

Flexible	Fearful	Feisty
Regular rhythms	Adapts slowly	Active
Positive mood	Withdraws	Intense
Adaptability		Distractible
Low intensity		Sensitive
Low sensitivity		Irregular
		Moody

Temperament Types
Flexible, Fearful, and Feisty

Flexible

Fearful

Feisty

The Developmental Continuum from Birth to 15 months: Social and Emotional Indicators*

Age Range	Attachment Trust/Security	Self-Awareness/ Identity	Exploration Autonomy/Independence
Infant (Birth to 15 months)	• Newborns recognize human language and prefer their own mother's voice • Prefer human faces • Early social interaction is a smile and mutual gazing • Crawls away but checks back visually; calls, and gestures to ensure adult contact • Stretches arms to be taken • Prefers familiar adults • Acts anxious around strangers • Uses a blanket or stuffed toy for security and reassurance	• Goes from accidentally sucking own hands to carefully watching them • Tries to make things happen • Hits or kicks things to make a pleasing sight or sound continue • Talks to self when alone • Prefers to be held by familiar people • Imitates adult behaviors • Knows own name • Understands simple directions	• Brings thumb or hand to mouth • Tracks mother's voice • Observes own hands • Babbles using all types of sounds • Uses a few words mixed with babbling to form sentences • Tries to keep a knee ride going by bouncing to get the adult started again • Shows strong feelings (anger, anxiety, affection)

**This list is a sampling of developmental indicators and is not intended to include all behaviors associated with early development. For infant, there is considerable overlap among areas of growth. The term "mother" is used to represent the primary attachment figure.*

The Developmental Continuum from 12 months to 2 ½ years: Social and Emotional Indicators (cont'd)

Age Range	Attachment Trust/Security	Self-Awareness/ Identity	Exploration Autonomy/Independence
Toddler (12 mos. to 2 1/2 years)	• Relates to others by exploring things with them • Pulls up, stands holding furniture, then walks alone • Goes through a phase of clinging to primary caregiver • Experiences periods of intense feelings when separating or reuniting with a parent • Sees others as a barrier to immediate gratification	• Knows can make things happen but is not sure of responsibility for actions • Becomes bossy • Uses the words me, you, and I • Says "No" to adults • Explores everything • Is sensitive to others' judging behavior	• Keeps looking for a toy that is hidden from view • Understands many more words than can say • Has wide mood swings (for example, from stubborn to cooperative) • Wants to do things by self

Adapted with permission from J. Ronald Lally, Abbey Griffin, et al., Caring for Infants and Toddlers in Groups: Developmentally Appropriate Practice (Washington, DC: ZERO TO THREE/The National Center, 1995), pp. 78-79.

The Developmental Continuum from Age 2 ½ - 3 ½ : Social and Emotional Indicators (cont'd)

Age Range	Attachment Trust/Security	Self-Awareness/ Identity	Exploration Autonomy/Independence
Preschool (2½ to 3½ years)	• Is capable of dramatic play • Has better control over all aspects of self • Needs to practice • Needs adult coaching to get along well with others • Shows feelings with words and in symbolic play • Is more aware that others have feelings • Can plan ahead	• Is capable of self-evaluation (for example, good, bad, pretty, ugly) • Tries to control self (for example, emotions and toileting) • Is learning to take turns in conversations • Knows a lot about communicating in the style of own culture • Can play well with others if the setting is right	• Uses names of self and others • Can tell others about what happened that day • Has much larger vocabulary to express ideas • Shows concern for others • Classifies, labels, and sorts objects and experiences into groups

Adapted with permission from J. Ronald Lally, Abbey Griffin, et al., Caring for Infants and Toddlers in Groups: Developmentally Appropriate Practice (Washington, DC: ZERO TO THREE/The National Center, 1995), pp. 78-79.

Brain Development

- When little was known about the human brain it was often assumed that babies were born with a fully developed brain and that was the end of the story. After a little more investigation scientists began to hypothesise that in fact the brain was not fully developed at birth but that it was pre-determined to grow only as the child's genetics instructed. More modern science has confirmed that though a baby is born with most of his/her brain cells developed, it is through experience that the connections between these cells are formed. These experiences are based on the baby's senses – touch, sight, taste, smell and hearing – and as the baby grows into a young child who begins to explore his/her world, the understanding that (s)he gains through these senses shapes brain development.





Types of Brain Development

- Brain development occurs unevenly, with different parts of the brain (related to different skills) developing at different times. Most of this development takes place during childhood, meaning that the early years are the prime time for children to learn and grow under the encouragement of their family and friends. The different types of brain development in children include:

Visual and auditory development

Language development

Physical and motor development

Emotional and social development

Visual and auditory development

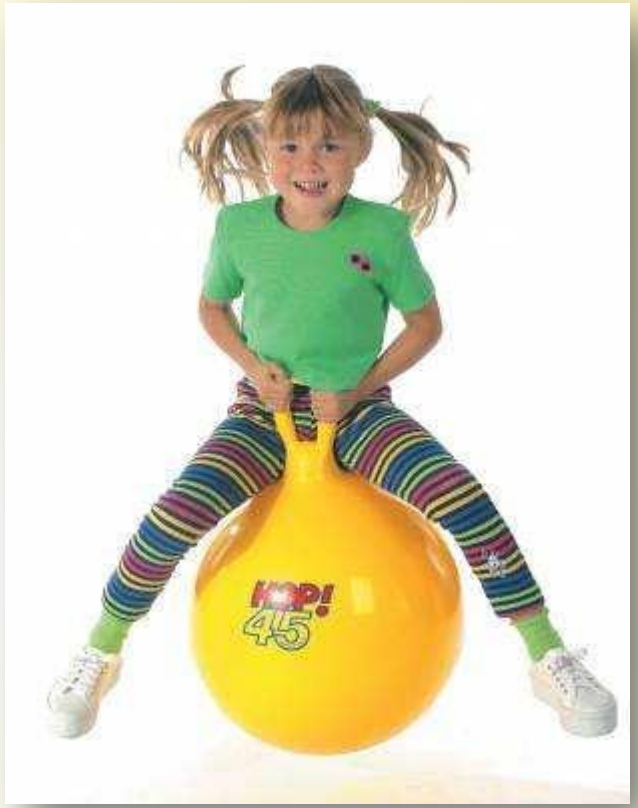
- the development of the sight and hearing senses. To encourage these senses, parents must make sure that their children are exposed to a variety of colours, shapes and sounds.

Language development

- the development of language and speaking skills. Parents should talk, sing and read to their children often, and respond to their children's language attempts in order to foster this development.

Physical and motor development

- – the development of control over the muscles to encourage large motor skills (mainly using the legs and arms) and fine motor skills (mainly using the hands/fingers and feet/toes). The development of coordination will also occur in this area. Parents should encourage these skills by allowing their children to be active and participate in a variety of physical games and activities.



Emotional and social development

- – the development of emotions and social skills. Parents should provide a warm, loving environment for their children so that they can develop emotions like love, trust and empathy, as well as provide their children with opportunities to be social so that they can develop skills such as sharing.





- Parents, as the primary care givers for young children, can contribute to brain development by leading by example. Speaking, reading and singing to young children will keep them engaged, while enjoying an active lifestyle and many different types of games will allow children to physically flourish. Providing opportunities for safe exploration, while at the same time providing a loving, warm home life, will encourage brain development in young children and hopefully set them on the road to a lifetime of happiness.





Infant and Pre-school tests

- Infant scales and pre-school tests measure different components of intellectual ability. Infant tests measure the developmental progress of babies and children focussing on areas such as gross-motor, fine-motor, language development, adaptive behaviour, personal-social behaviours, sensori-motor intelligence, and so on. Pre-school tests focus more on the cognitive abilities of the child. The most widely used infant measures are:
- **Batelle Developmental Inventory**, (BDI) (Birth to 8). This is a Standardised/Norm-Referenced test. 341 items assesses Personal-social, adaptive, motor, communication cognitive domains. There are 22 subdomains (e.g., coping, peer interaction, attention, memory, expression of feelings). The Battelle merges norm-based, curriculum-based and adaptive features into a flexible instrument. It provides a good example of curriculum referencing and linking assessment, intervention and evaluation beyond a curriculum. It is helpful in identifying a child's patterns of strengths and weaknesses. Some caution is needed in interpreting scores because of the small number of items in most subdomains (Ritter, 1995).
- **The Bayley Scales of Infant Development-II** (1 to 42 months) is a Standardised/ Norm referenced test. Broad content coverage includes--Mental Scale, Motor Scale and Behaviour Rating Scale. The Psychomotor and Mental Scale each yield an Index Score, with a Mean of 100 and a standard deviation of 16. Mental and motor ages can be estimated from the norm tables provided.

- Pre-school children show a wide variety in emotional maturity and respond differently to the examiner. For some children the examiner can be sure that the test results reflect an accurate level of cognitive functioning, but with other children, this is not so. A child can be shy and non-responsive, but this does not show a lack of skill, but rather a lack of co-operation. Pre-school tests need to be approached with caution to avoid the negative consequences of labelling or overdiagnosis (Gregory, 2000).
- The most common suitable pre-school test known by Schakel (1986) as "the big 4" are the:
- " Wechler Preschool and Primary Scale of Intelligence (WPPSI-R)
- " Stanford-Binet: Fourth Edition (SB:FE)
- " Kaufman-Assessment Battery for Children (K-ABC)
- " McCarthy Scales of Children's Abilities (MSCA)
- The Kaufman-Assessment Battery for Children (K-ABC) (2 ½ to 12 ½) is a standardised / norm referenced test. It is scored using standard scores, percentile ranks, stanines and age equivalents. Separate percentile tables are provided for several socio-cultural sub groups. The K-ABC is a multi-subtest battery, which facilitates inter-area comparisons. A Composite Mental Processing Score is calculated from the Sequential and simultaneous areas. A non-verbal score can be calculated from appropriate Mental Processing subtests. The statistical information is very complete and includes a choice of confidence bands. This type of information, the clear format for the test instructions, and the norm charts make it comfortable for the assessor to administer and score. K-ABC is not modelled after the Binet (most standardised tools are). It is based on a theoretical framework that looks at sequential and simultaneous processing. The child needs to be able to imitate the assessor and to respond to pictures and cards with adult in a "testing" situation (Ritter, 1995)

- **The Stanford-Binet**: Fourth Edition (2 to adult) is a Standardised/Norm-Referenced Test. It is used to measure overall mental skill and provide a profile of mental functioning in four areas: verbal reasoning (vocabulary comprehension, absurdities, verbal relations), abstract/visual reasoning (pattern analysis/block design, form copying; matrices, paper folding and cutting), quantitative reasoning (quantitative number series, equation building), and short-term memory (sentence memory, bead memory, digit memory, object memory) (Vacc, 1995).

- The Standford-Binet is a completely revised measure that is more like a whole new battery rather than a revision of previous items. It attempts to retain the advantages of the older Stanford-Binet tests (e.g. one basic test for ages 2 through adulthood), while also providing scoring patterns and interpretations similar to the Wechsler tests. (Vacc, 1995)

- The Stanford-Binet consists of 15 sub-tests grouped into four areas. Each area yields a Stanford Age Score (SAS) with a mean of 100 and a standard deviation of 15. Scores from all four areas are combined into a Composite Score, also with a mean of 100 and a standard deviation of 15. The composite Score is equivalent to full scale IQ. Each sub-test within the group of sub-tests yields a standard type score, with a mean of 50 and a standard deviation of 8. The assessor needs to take care in reporting the child's results in order to avoid confusion between the scales used for the area and the sub-test scores. The manual presents suggestions for abbreviated batteries tailored to specific testing needs.

Conclusion

- Testing children is a difficult process in which many factors have to be taken into account. In the diverse societies in which many of us live each and every child has to be closely examined for cultural and social differences. The examiner has a huge responsibility to both the parents and the child to make the test as fair as possible. As assessment has a large role in society today in screening children for neurological impairment, mental retardation, and school readiness, it is essential that the examiner follows testing procedures properly and efficiently. Testing children is an arduous process where consent must be gained from the parents of the child, and all the information concerning the testing process, and results have to be carefully explained.
- Young children are so active an alert that the testing situation may become difficult, and drawn out. As I found out, testing a child is not as easy as many people might think, and requires patience, control and much persuasion. Children are constantly exploring their worlds, and an examiner may not be an interesting part of this world, forcing the child to find more interesting stimuli. It is important for an assessor to chose a suitable test for each particular child, and to explore documents from parents and significant others that may aid the assessment situation.
- Assessment is important if there is any sign that a child is not developing normally and at the correct pace. Early detection of problems is critical and tests may aid in this detection.

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