

Language Development

Brian Rogers MD

Milestones

“ In the normal infant, development is methodical, orderly and timed; it goes through a gradient that can be divided into orderly sequences which can follow each other with such regularity that they are in the main predictable.”

Gesell, 1947

Expressive Language Stages

- Guttural: 0-2 months: crying, sneezing, burping, yawning
- Prelinguistic: 2-11 months: Cooing, ah-goong, babbling, “dada” (nonspecific)
- Linguistic: 11 months: The use of formed identifiable words, generally begins with “Mama” and “Dada” (specifically), with the addition of another real word.

Prelinguistic Definitions

- Cooing: Long vowel sounds in a musical fashion.
- Razzing: Raspberry
- Babbling: Consonant-vowel or vowel-consonant construction.
- Gestures: Imitate “bye-bye” or “patty cake”

Prelinguistic Expressive Milestones

<u>Milestone</u>	<u>Mean Age (mos)</u>
Cooing	3
Ah-goo	4
Laughing	4
Razzing	5
Babbling	6

Prelinguistic Expressive Milestones

<u>Milestone</u>	<u>Mean Age (mos)</u>
Dada (non specific)	7
Mama (non specific)	8
Dada/Mama (specific)	9
Gestures	9

Linguistic Definitions

- Words: Credit may be given if the word(s) are used consistently, specifically, and spontaneously. Mama, dada or other family names are not counted.
- Jargon: Long strings of unintelligible sounds with adult-like intonations.

Linguistic Definitions

- Phrases: Two words together (“more drink”, “Go bye-bye”). Words combined should be used individually in the child’s vocabulary (e.g. “hot dog” or “stop that”) are counted as one word.
- Sentences: Noun and verb (“Me want cookie”, “Daddy eat”) originated by child.
- Echolalia: Speech that is an immediate imitation of some other speaker.

Expressive Language Milestones

- 11 mo: 1 word with specific “Mama” and “Dada”
- 12 mo: 2 words
- 13 mo: 3 words
- 15 mo: immature jargoning
- 16 mo: 4-6 words
- 17 mo: mature jargoning
- 18 mo: 7-10 words

Expressive Language Milestones

- 19 mo: 20 words
- 21 mo: two word phrases
- 24 mo: 50 words and 2 word sentences
- 26 mo: Pronouns
- 30 mo: 250 words, repeats 2 digits
- 36 mo: 3 word sentences, repeat 3 digits,

Expressive Language (30-36 months)

- Four to five word sentences
- Speech understood at least 80% of the time.
- Use of plurals

Expressive Language (36-42 months)

- Gives full name when asked
- Counts to three
- Appropriate use of pronouns
- Know sex (boy vs. girl)

Cautions with Expressive History

- Echolalia
- Define vocabulary
- 2 word phrases vs. single concept
- Phrases vs. Sentences
- NB: Reliability of history is likely to improve if expressive milestones are paired.(mature jargon occurs with 7-10 word vocabulary)

Receptive Language

- 1 mo: alerts to sound, soothes
- 2 mo: social smile
- 4 mo: orients to voice
- 5 mo: lateralizes to bell
- 8 mo: indirect orient to bell
- 9 mo: direct orient to bell
- 10 mo: understands “No”

Receptive Language

- 12 mo: follows one step command with gesture
- 15 mo: follows one step command without gesture
- 16 mo: points to one picture,
- 18 mo: 2 body parts
- 21 mo: points to two pictures
- 24 mo: follows 2 step command
- 30 mo: concept of “1”,
- 36mo: 2 step prepositional command, points to 7 pictures

Pointing to Pictures



Receptive Language (30-36 months)

- Follows two prepositional commands (on, in)
- Identify objects or pictures based on function (“what do you hear with?”).
- Descriptive concepts (big, little, hot, cold).

Receptive Language (36-42 months)

- Can answer correctly the questions “What do you do when you are sleepy, hungry, or cold?”
- Follows 4 prepositional commands (in, on, under, behind)
- Can repeat 3 digits when asked.
- Compares length
- Able to group or sort (clothes, toys)

Cautions with Receptive History

- Clarify multi- step directions
- Pronoun use is appropriate
- Concept of “1”

Development of Social Cognition

- Increasing frequency of alternating gaze between desired object and the face of the communicative partner from 12-15 months of age.
- Increasing communicative intent of pointing for wants between 12-18 months.

Developmental Quotient

- Provides a means of quantifying developmental rate.
- Gesell’s Definition: the proportion of normal development in a child at the time of testing.
- $DQ = \frac{\text{Language Age}}{\text{Chronological Age}} \times 100$

Differential Diagnosis of Language Delay

- Developmental Language Disorder
- Hearing Loss
- Intellectual Disability
- Autism
- Environmental deprivation
- Elective Mutism
- Non causes: Birth order, gender, bilingualism

Development of Visual Learning

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Four Major Streams of Development

- Motor
- Language
- Adaptive or Visual Problem Solving *
- Personal-Social

Adaptive-Visual Problem Solving

- Visual Problem Solving Skills represent a complex interplay of cognition, motor development and visual acuity.

Early Postnatal Visual Development

<u>Visual Behavior</u>	<u>Mean Age (mos)</u>
Eyes and head tracking (smooth, not saccadic)	2-3
Visual Threat Response	3

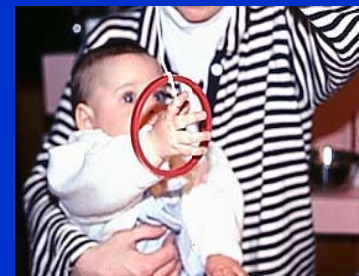
Visual Motor/Problem Solving Development

- Reduction of “primitive reflexes” and the appearance of volitional motor skills during the first 6 months of life.

<u>Milestone</u>	<u>Age (mos)</u>
Head to midline (supine)	3
Hands to midline	3
Head and Trunk aligned in sitting position	3
Eyes, head and hand (palmar)	5
Sit and extended pincer grasp	11

Ring and String

- 1 mo: fixes
- 2 mo: follows horizontally and vertically
- 3 mo: follows in a circle
- 5 mo: pulls down ring, transfers
- 7 mo: inspects the ring
- 8 mo: pulls ring by the string
- 9 mo: visually follows over the edge of table





Pellet (and bottle)

- 5 mo: visually regards pellet
- 7 mo: attempts to secure pellet
- 8 mo: secures pellet
- 9 mo: demonstrates 3 finger grasp
- 11 mo: mature pincer grasp
- 14 mo: dumps pellet from bottle with demonstration
- 16 mo: spontaneously dumps pellet from bottle



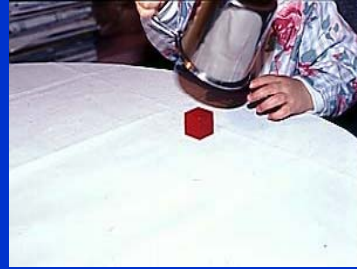
Cubes, Cup, and Stick

- 6 mo: obtains cube
- 10 mo: combines cube and cup
- 11 mo: solves cube under cup
- 12 mo: releases cube in cup
- 18 mo: 10 cubes in the cup
- 21 mo: tower of 3 cubes, obtains cube with stick
- 24 mo: 4 cube horizontal train
- 30 mo: 4 cube train with chimney
- 36 mo: 3 cube bridge

Cube and Cup

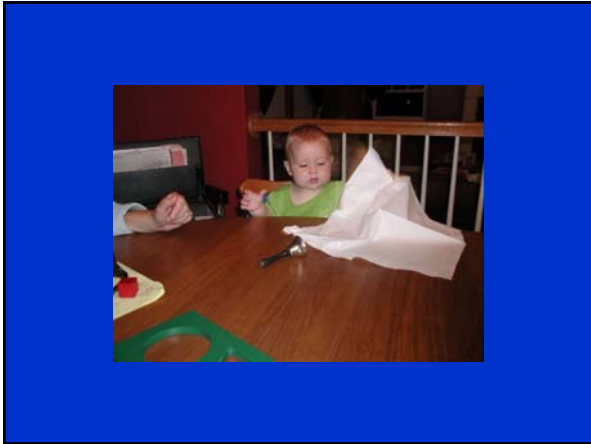


Cube under cup



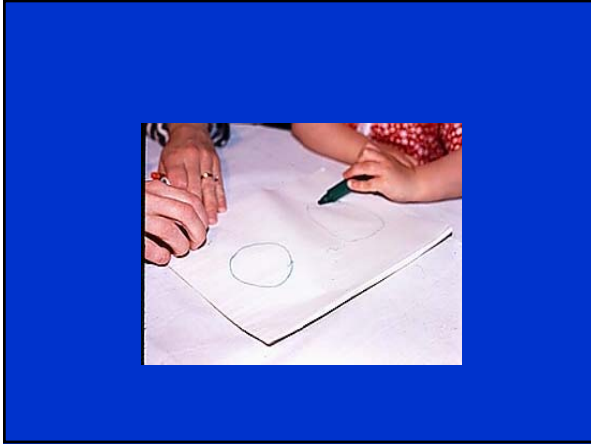
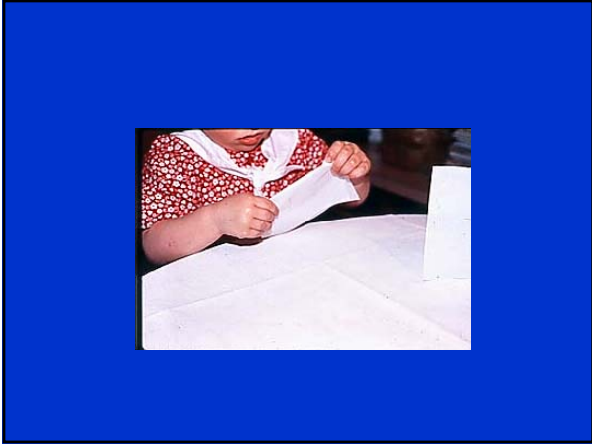
Bell and Glass Barrier

- 1 mo: alerts
- 5-9 mo: orients to bell
- 8 mo: inspects bell
- 9 mo: rings bell
- 10 mo: uncovers bell
- 14 mo: solves glass frustration



Crayon and Paper

- 12 mo: makes mark with crayon
- 16 mo: scribbles in imitation
- 18 mo: scribbles spontaneously
- 24 mo: imitates stroke, attempts to fold paper
- 30 mo: horizontal and vertical strokes, folds paper
- 36 mo: draws circle in imitation, draws man



Pegboard

- 7 mo: Pulls peg out
- 14 mo: Removes and replaces peg
- 18 mo: Pegboard completed spontaneously

Formboard

- 16 mo: Places round block
- 18 mo: Places round block (reversed)
- 21 mo: Places square block
- 24 mo: Places round, square and triangle blocks
- 30 mo: Completes in reversal.

Equipment needed for Capute Scales (0-36 mos)

- Four inch red ring with string.
- Cup and ten cubes
- Pegboard (six pegs)
- Metal bell
- Crayon and paper
- Tissues
- Card with 4 pictures
- Card with six pictures
- Transparent bottle with pellets
- Round six inch stick
- Glass (Plexiglass)
- Formboard with three shapes

Interpretation of Visual Problem Solving Performance

- A convenient method to interact with young children. Can observe temperament, joint attention, and parent child interaction.
- Direct observation of child's movement and posture, and cognitive adaptive skills. Potentially confirm parents observations regarding play and personal-social skills.

Interpretation of Visual Problem Solving Skills

Significant Delay:

$$\frac{\text{V.P.S. Age}}{\text{C.A}} (100) < 70$$

Interpretation

LANGUAGE	Delayed	Delayed
VISUAL MOTOR	Delayed	Normal
	ID	DLD