

# A Systems Approach to the Development of Feeding Skills and Feeding Disorders

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## Abstract

### Abstract

This poster presents a comprehensive systems approach to the understanding of feeding development in children with and without disabilities, providing information useful for the decision-making process leading to best practice intervention.

The comprehensive perspective is described as a series of vertical developmental sequences in which oral and fine motor skills are interwoven horizontally with corresponding gross motor, visual, cognitive, communicative, social, and emotional levels, with emphasis on how feeding impacts, and is impacted by, all these domains.

This perspective thus includes consideration of the feeding relationships between children/caregivers, and the infant/family professional's role as facilitator of these relationships.

Tables with video captures of case study examples illustrate assessment procedures and demonstrations of intervention strategies.

## Overview of Typical Development and Implications for Feeding

### Overview of Typical Development and Implications for Feeding The Newborn (Example: Bottle)

Developmental Domains	General Characteristics	Implications for Feeding
Gross motor domains	Disorganized postures and movements, more reflexive than intentional	Little postural support, may use ATNR reflex pattern for stability. Suck full support for efficient bottle feeding.
Fine motor domains	Head movements are reflexive, random, and exploratory rather than intentional	Compact hold bottle, dependent on caregiver for all feeding.
Oral motor domains	The mouth serves as the primary motor and sensory organ	Diurnal food intake is dependent on reflexive sucking skills.
Emotional domains	Emotional state is dependent on homeostasis	Sucking is used as a self-soothing strategy.
Visual/cognitive domains	Visual information is perceived, but not always interpreted clearly or meaningfully	First food textures are on caregiver's face during feeding (beginning of eye trace).
Communicative/social domains	Attachment/bonding is dependent on primitive sense such as touch, smell, taste, and sound, rather than words	Attachment is strengthened by bottle feeding because of its frequency and sensory and social significance.

### Overview of Typical Development and Implications for Feeding The Infant (Example: Dependent Spoon Feeding)

Developmental Domains	General Characteristics	Implications for Feeding
Cognitive/ fine motor domains	Visits is linked with sensory and goal-directed movements; hand skills are clumsy rather than stable	Sees and feels food being cooked, important to eat, grasp, spoon and try to bring to mouth (intention).
Emotional domains	Can give verbal and non-verbal signals to caregiver about current needs and wants	Sensitive caregiver reads signals (often, what, and how much food to present on the spoon).
Gross motor domains	Head and trunk control up against gravity, more coordinated motor patterns	Head control provides stability for coordinated mouth movements when taking food from spoon.
Oral motor domains	Lips, tongue, and cheeks move in global, reflexive patterns	Can handle smooth textures only in global pattern.
Communicative/social domains	Responds pleasantly to social interactions	Enjoys spoon-feeding for social motor as well as for satisfaction of hunger.

### Overview of Typical Development and Implications for Feeding The Toddler (Example: Finger Feeding)

Developmental Domains	General Characteristics	Implications for Feeding
Fine motor domains	Development of fingers, more precise grasps	Fine grasp grip of food pellet.
Gross motor domains	Increased stability and postural control in a variety of anti-gravity positions	Postural body control provides stability for arm stability and hand skills in finger feeding.
Visual/cognitive domains	Improved eye-hand-mouth coordination, explore objects for functionality	More expert finger feeding, less mess.
Oral motor domains	Discussion of lip, tongue, cheek muscle, jaw movement, resulting in better control of food in mouth	Food directed to different sense of mouth to prepare for chewing and swallowing with ease.
Emotional/social/communicative domains	Communicates feelings and intentions with gestures and some speech	Expresses food likes and dislikes clearly.

### Overview of Typical Development and Implications for Feeding The Walker (Example: Utensil Use)

Developmental Domains	General Characteristics	Implications for Feeding
Fine motor/visual domains	Head configure to shape of different objects; improved bilateral hand use	Adapt grasp to various spoon handles, scoop with one hand, stabilize bowl with the other.
Gross motor domains	More spatial awareness and control during body movements in a variety of positions	Shoulder and arm control provide stability for manual dexterity and complex handling of utensils.
Oral motor domains	Finely graded and differentiated movements of mouth structures	Stable jaw facilitates lip control for cup-drinking without spilling.
Emotional/cognitive domains	Independent thinking, desire for autonomy	Refuse assistance when trying new utensils, want to "do it myself".
Social/communicative domains	Motivated to gain attention and probing interaction with caregiver	Role reversal strategies are successful when general time to introduce unfamiliar foods.

## Research Study

### Videotaped Research Study

**Purpose:** The purpose of this study was to collect data from videotaped case studies, comparing comprehensive developmental behaviors during self-feeding of a typical child and children with special needs. These data would be used to identify needs and plan appropriate intervention for infants and toddlers with feeding disorders.

**Method:** A typical infant was videotaped during self-feeding tasks at monthly intervals from the age of 8 months to 2 years. Observations of gross motor, fine motor, oral-motor, and social behaviors were documented. These behaviors were compared to corresponding behaviors in older children with disabilities during feeding evaluations, to collect information concerning family concerns (functional problems, desired goals), observation of feeding (positioning, reflexes, respiration, tactile sensitivity, oral hygiene, nutrition, oral-motor components, developmental behaviors, independent behaviors), and recommendations for intervention.

**Results:** The data collected revealed that task analysis of both typical and atypical feeding behaviors, using developmental and functional frames of reference, can be instrumental in problem-solving and planning treatment for children with special needs. Results were compiled in charts entitled Overview of Typical Development and Implications for Feeding, and Examples of Atypical Development and Implications for Feeding).

## Examples of Atypical Development and Implications for Feeding

### Examples of Atypical Development and Implications for Feeding The Older Child at the Newborn Stage

Developmental Domains	General Characteristics	Implications for Feeding
Gross motor domains	Minimal control of posture and movement, reflexive patterns such as the ATNR may be used for stability	Head full postural support, symmetrical postures during dependent feeding.
Fine motor domains	Few respiratory hand movements, very low or very high muscle tone (spasms)	Flexibility of hand skills, stereotypic patterns are sufficient for self-feeding.
Emotional domains	Emotional fluctuations related to problem in self-regulation	Persistent mouthing of non-utensile objects serves to self-regulate.
Oral motor domains	Sensory as well as motor functions of mouth not well developed	Food intake is compromised by pressure or weak sucking skills, reflux, or aspiration problems.
Visual/cognitive domains	Directed or incomplete visual input, poor eye-muscle control, limited comprehension	Can focus only briefly on caregiver's face while being fed, losing opportunity to practice food fixation.
Communicative/social domains	Attachment/bonding blocked by delayed or no responsive speech	Social interactions during feeding are negative more often than positive.

### Examples of Atypical Development and Implications for Feeding The Older Child at the Infant Stage

Developmental Domains	General Characteristics	Implications for Feeding
Cognitive/ fine motor domains	Preference schemas limited in scope, hand skills are rudimentary and developmentally delayed	Utensils are perceived as toys, rather than functional tools.
Visual/emotional domains	Visits is linked with those sensory experience that are most motivating and exciting	Primal senses of smell and taste combine with visual cues, which heighten the anticipation to eat.
Gross motor domains	Incomplete head and trunk control, accelerated motor patterns	Without a stable head, mouth movements are poorly coordinated for taking food from a spoon.
Oral motor domains	Lips, tongue, and cheeks move in global, reflexive patterns	Can handle smooth textures only, may need jaw control to inhibit reflexes such as the pharynx.
Communicative/social domains	Fixates on non-verbal more than verbal signals to communicate needs and wants	Sensitive caregiver reads signals (often, what, and how much food to present on the spoon).

### Examples of Atypical Development and Implications for Feeding The Older Child at the Toddler Stage

Developmental Domains	General Characteristics	Implications for Feeding
Gross motor domains	Diminished mobility and less variety of movements in hand-anti-gravity positions	Without postural head and body control, distal embedded movements not skillful enough for self-feeding.
Fine motor domains	Delayed development of precise grasp; limited dexterity of thumb and fingers	Finger feeding often messy, limited to certain food sizes and shapes, crude, inefficient grasp of food pellet.
Oral motor domains	Limited discussion and control of mouth structures; lip, or hyper-reactivity to touch	Incomplete motor and sensory function, limits comfort level in accepting new foods.
Visual/cognitive domains	Poor discussion and delayed hand skills compromise eye-hand coordination	Difficulty handling food on surface for finger feeding.
Emotional/social/communicative domains	Communicates feelings and intentions with gestures more than speech	Expresses food likes and dislikes clearly.

### Examples of Atypical Development and Implications for Feeding The Older Child at the Walker Stage

Developmental Domains	General Characteristics	Implications for Feeding
Fine motor/visual domains	Unable to configure hand to the shape of different objects; many atypical hand patterns, limited bilateral hand use	Inefficient grasp of utensils, adapted handles may help, tends to use opposite hand for holding or stabilizing container.
Gross motor domains	Spatial awareness and control is hampered by lack of movement experience	Manual dexterity with utensils is subverted without perfect shoulder and arm control.
Oral motor domains	Has an differentiated and finely graded movements of mouth structures	Head caregiver's help to control liquid flow for cup drinking without spilling.
Emotional/cognitive domains	Learns to magnify others to isolate or complete of food tasks rather than present	May remain more dependent than necessary on caregiver for feeding tasks.
Social/communicative domains	High motivation for personal independence and interaction with others	Motivated to imitate peers at school, create independently from milk carton.