

Development of Childhood Occupations

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1. What are historical and current theories of child development?
2. How do a child's unique characteristics influence skill development?
3. Using an occupational therapy perspective, how do occupations develop?
4. How do individual biologic systems and cultural, social, and physical contexts contribute to a child's occupational performance in the first 10 years of life?
5. How do child performance and contextual variables contribute to the development of play?

An understanding of child development is foundational knowledge for pediatric occupational therapists. Researchers from many disciplines, including medicine, psychology, anthropology, education, sociology, and occupational therapy, have contributed to the literature on human development, and the different perspectives they provide should be woven into a holistic and comprehensive understanding of how children become adults.

Occupational therapists ask *what* developmental changes occur in children and *how* children develop their unique personhood. The answers to these questions provide essential knowledge for evaluating children and for determining the appropriate materials, activities, and environments to support children's skill development and participation in their communities. They are also interested in how human occupations develop over the life span.

This chapter focuses on child development theories, with emphasis on concepts that have emerged in the past 3 decades. The first section discusses concepts that explain how children develop and which variables and interactions influence developmental outcomes. In the second part of the chapter, a model for the development of childhood occupations is applied to children's development of play in the first 10 years of life. [Chapter 4](#) describes the development of preadolescent and adolescent occupations in the second decade of life.

Developmental Theories and Concepts

Developmental theories have guided education and therapy for children with developmental disorders for the past 60 years. Researchers of the 1930s and 1940s identified a sequence of skill maturation that defined the steps of normal development. Gesell and colleagues⁵²⁻⁵⁴ and McGraw⁹⁶ assumed that normal development followed a specific skill sequence that reflected maturation of the central nervous system (CNS). These scholars believed that the sequence of motor, cognitive, social-emotional, and language skill development was relatively unaffected by the infant's experiences. The sequence of normal development is an important frame of reference for creating developmental assessment tools that identify children with disabilities. Gesell and Amatruda⁵³ believed that variations in the normal sequence of development indicate CNS dysfunction. Identifying children with developmental deficits or significant delays remains an important role of physicians, nurses, occupational therapists, and others who provide early intervention services. Since the 1940s, theories of child development have evolved from observational and longitudinal research that identify the stages of child development and define key developmental milestones to studies that reveal the complexity of child development as it relates to cultural, physical, and social environments. This section describes theories that relate primarily to (1) cognitive development, (2) motor development, (3) social-emotional development, (4) self-identity and self-determination development, and (5) ecologic models.

Cognitive Development

In contrast to the first theories of child development that proposed a predetermined step-by-step process,^{9,53} scholars and researchers in the twentieth century understood that child development was influenced by the child's cultural, social, and physical contexts. They explained that development can be

represented by a pyramid, meaning that new skills are built on foundational abilities.^{62,109} The concept of a pyramid suggested that each new stage builds on specific foundational skills. Children move between more advanced or more primitive behaviors in different contexts, and new behaviors depend on not only neurologic maturation but also the demands, challenges, supports, and learning opportunities in the environment.⁸¹

Interplay of Intrinsic and Environmental Factors

One of the first scholars to describe this interactive nature of cognitive development was Jean Piaget. Piaget¹⁰⁹ expanded our understanding of a child's maturation by emphasizing that development occurs through the interaction between the environment and the child's innate abilities. Children adapt and grow developmentally through social and physical relationships. Piaget¹⁰⁹ introduced the idea that children are intrinsically motivated to learn from their surroundings and that they act on, rather than simply react to, their environment. Beginning in infancy, children develop *cognitive structures*, or *schemas*, to represent objects, events, and relationships in their minds.⁹⁸ Piaget emphasized the maturation of cognitive structures that enable the child to understand the environment, language, and social action. Every interaction is an opportunity either to assimilate new knowledge into existing structures or to adapt existing structures to accommodate new information. The influence of the environment on the child's development changes as the child becomes increasingly able to assimilate the complexities of physical and social events.

Piaget documented the child's maturation through stages of sensorimotor exploration to the acquisition of symbolic thought and formal cognitive operations. The developmental stages follow a predictable sequence but vary to the extent that they reflect genetic endowment and the child's experiences. Children's cognition matures from the simple to the complex, from the concrete to the abstract, and from personal to worldly concerns. Piaget specified four maturational levels or periods of cognitive function—sensorimotor, preoperational, concrete operational, and formal operational^{46,86,97,98}—that lead to the cognitive maturity of adulthood. Through these stages, children develop mental representations of the world that they use to understand and respond to events. The culmination of these levels is a person who has values, goals, and purpose (i.e., has become an occupational being). At the present time, most child researchers agree that the child is an active learner but do not view development in discrete stages.

This interplay between the child's abilities and his or her experience can be appreciated in the early development of tool use. Children at 8 to 10 months of age can manipulate two objects and can move an obstacle to reach an interesting or novel object (sensorimotor stage). By 12 months, infants can relate an object to other objects, in addition to relating the objects to themselves. At this stage, infants use a stick to rake in an object out of reach and place objects into containers (sensorimotor). By 18 months of age, infants begin to use trial-and-error to solve problems (preoperational). At 24 months of age, children no longer exclusively need physical manipulation to solve problems and begin to demonstrate use of mental manipulation (preoperational).^{96,110,111}

Research studies in the 1990s demonstrated that cognitive structures develop at earlier ages than Piaget assumed; they also

demonstrated that child development has more continuity and integration across the stages of development.^{21,46} At 1 month of age, infants demonstrate the ability to associate learning from one sensory system with another sensory system. For example, they recognize objects with their eyes that they previously felt in their mouths.⁹³ Researchers found that 9-month-old infants can remember an event 1 week after it happened.⁹⁹

Problem solving also appears to develop earlier than believed; developmental studies show that toddlers can manipulate and use tools and can solve problems such as how to grasp and use a spoon. After grasping a spoon awkwardly, children 9 to 14 months old can adjust the spoon's orientation to get the food into the mouth.⁹⁶ Children 19 months old can plan how to grasp and orient the spoon to get the food before acting, avoiding the use of an awkward grasp that required adjusting. At 19 months of age, children can solve problems without physical manipulation and trial-and-error to handle a tool accurately. By this age, the child can scoop food, fill the spoon, and correctly angle it toward the mouth,⁷¹ signifying the early emergence of tool use.

Scholars have critiqued and expanded Piaget's original theories to appreciate fully how the environment influences development. For example, Piaget's theories lack full appreciation of the influence of culture, society, and technology on development of children. Current occupational therapy theories consider these variables to have important roles in a child's development.^{11,150} In addition, Piaget's theories did not address the development of emotions and did not have a coherent explanation for individual differences, individuality, or variability.^{46,97} The importance of variability has been highlighted in the work of other psychologists^{133,136} and by occupational therapy researchers.⁷⁴

An understanding of Piaget's theory is important to occupational therapists who provide interventions for children. Regardless of the therapeutic approach used in treatment, the occupational therapist interacts with a thinking child who is continually learning from his or her environment. It is essential that the selection and structure of an activity be in accordance with the child's cognitive development.

Influence of Social Interaction on Learning

Following Piaget, another developmental theorist, Vygotsky,¹⁴³ proposed new concepts that explained how children learn through interacting with their environment. Similar to his predecessors (e.g., Gesell, Piaget), he understood that genetics has unequivocal influence on development; however, Vygotsky theorized that the child develops by internalizing the social interactions that he experiences. Social interaction has a fundamental influence on the child's development of cognition and language. A child's cognitive processing first requires the assistance of another being within a social interaction before the child can mentally process on his or her own. Cognitive processing is a social process before it is an internal process, and a child's development and learning are critically dependent on social interaction. Learning is essentially culturally determined, and culturally valued activities are the context of a child's development.¹⁴³

Vygotsky defined a "*zone of proximal development*" to explain how learning occurs through social interaction. The zone of proximal development is "the distance between the

actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or collaboration with more capable peers” (p. 86).¹⁴³ What a child can achieve and learn with the assistance of another is the zone of proximal development and defines the area in which adults can work with the child to promote the child’s development and independence in a particular skill.¹⁴³ What children can do with the assistance of others may be more indicative of their mental development than what they could do independently. When presented with a *just-right* challenge (e.g., a task that is slightly more difficult than the tasks the child has currently mastered), the child generally attempts and succeeds in this challenge, learning the next step in skill development.

The mechanism through which children learn in social interaction is termed *scaffolding*—the support provided by caregivers and teachers. Scaffolding performance within the child’s zone of proximal development is the process by which an occupational therapist supports or guides a child’s actions to improve competence. Appropriate guidance is the just right amount of support that enables the child to perform at a higher level. When using scaffolding to facilitate the child’s learning, the adult gradually decreases the amount of support provided such that the child performs more independently. Through this process, actions that are externally supported become internalized. The child’s help-seeking in an activity can be as important to his learning as receiving assistance. By asking questions and help-seeking, the child becomes more self-directed in his learning. When the occupational therapist understands a child’s zone of proximal development and perceives methods for scaffolding his learning, the therapist can design an optimal activity to promote the child’s learning.

When an adult creates a learning opportunity that is an optimal balance between the child’s existing skills and the challenge of the task, the adult can model language and behavior to help the child progress. Vygotsky’s emphasis on the interactions between a child’s learning, his or her environment, and the type of instruction provided was a precursor to many of the system models that influence learning theory today.

Vygotsky and many subsequent developmental theorists have examined how human development transpires through a dynamic interplay involving the child and the child’s cultural, social, and physical environments. For example, rates of development appear different according to the family’s economic status,^{16,89} cultural groups, and generations,¹⁶ in part because of differences in nutrition and childcare practices. In human development research, the emphasis currently is on the variations expressed by individual infants and on how human systems and environmental constraints contribute to these variations.

Motor Development

Neuromaturation

In neuromaturation theory, the essential sequence in which children attain developmental milestones is linear and consistent across children. Skills emerge sequentially according to the maturation of CNS structures.^{41,100} Brainstem structures develop first, as evidenced by the reflexive responses of the

newborn (e.g., automatic grasp, asymmetric tonic neck reflex) that are controlled by neural pathways originating in the brainstem. Cortical structures appear to develop later, as evidenced by the coordinated and planned actions of the child. The infant’s increasing control of action and skill indicates not only development and myelination of the midbrain and cortical structures but also simultaneous inhibition of brainstem control of movement. Using neuromaturation theory, motor development is explained by the following principles:

1. Movement progresses from primitive reflex patterns to voluntary, controlled movement. In newborn and young infants, motor reflexes provide the first methods of interaction with the environment (e.g., reflexive grasp) and are essential to life (e.g., the sucking and swallowing reflexes). Because early reflexive movements serve functional needs, the newborn appears surprisingly competent. These reflex patterns subside as balance, postural reactions, and voluntary motor control emerge (i.e., when the infant learns to roll, sit, creep, stand, and walk).
2. The sequence and rate of motor development are consistent among infants and children. The developmental scales of Gesell and Amatruda,^{53,75,76} Bayley,¹⁰ and others are based on a typical rate and sequence of development. By assuming that the sequence of milestones (i.e., major motor accomplishments) is constant and predictable, the normative developmental sequence can be used to diagnose neurologic impairment and disability.¹⁰
3. Low-level skills are prerequisites for certain high-level skills. Infants develop motor control in a cephalocaudal direction, with head control maturing first, followed by trunk control sufficient for independent sitting, and, finally, pelvic control sufficient for standing and walking (Figure 3-1).

In assuming a hierarchy of CNS function, the neuromaturation theory limits our understanding of how a child learns

FIGURE 3-1 Infants play in supported standing for extended periods, gaining postural stability and balance when holding onto a stable surface.

to act in the environment. In particular, this theory does not explain how children learn new motor skills and ignores that the CNS has vast plasticity that allows humans to adapt to their environments. Gottlieb⁶³ defines plasticity as a fusion of the child and the environment. Through both experience and development, new structures (e.g., cellular) and functions (e.g., performance) emerge. The child's experiences produce new neurologic connections and structural changes, and development of the relationships among components is important. Acknowledgment of the system's plasticity places the focus on the child's potential for change and on the contextual features that promote or limit a child's performance. Using current research models,^{58,60,133,134} occupational therapists and others recognize that multiple variables at different levels influence the child's skill development. The child learns occupations through interaction with his or her environment rather than through the emergence of a predetermined scenario reflecting neuro-maturational principles.⁷²

Dynamical Systems Theory

Dynamical systems theory refers to performance or action patterns that emerge from the interaction and cooperation of many systems, both internal and external to the child.¹³⁴ In the context of child development, performance patterns emerge from the interaction of an individual's systems and performance contexts as the child strives to achieve a functional goal.^{94,95,103} The dynamical systems theory is useful in describing how specific motor and process skills develop.

Humans are complex biologic systems comprising many subsystems (e.g., motor sensory, perceptual, skeletal, and psychological subsystems). These subsystems are in constant flux, interacting according to the task at hand and conditions in the environment. The child's actions during the performance of a task are the result of the subsystems' interaction with each other and with the environment.¹³⁰ These individual systems come together and self-organize in a coordinated way to achieve the child's goal.¹³¹ For example, initially a child is interested in exploring the sensory characteristics of a toy. As the child reaches for the toy, grasps it, and brings it to midline in hand-to-hand play and then finally to the mouth, the child's attention and cognitive focus are not on planning each of these actions. Instead, they are on assimilating the toy's actions and perceptual features (Figure 3-2).

Longitudinal studies reveal that children demonstrate unique trajectories of development and that variations in functional performance among children persist into adulthood. Thelen, Corbetta, and Spencer¹³⁵ demonstrated the uniqueness of motor development in a study of reaching in 4- and 5-month-old infants. Each 5-month-old infant was able to reach toward an object, but the patterns demonstrated were unique. Some infants demonstrated a slow, cautious first approach to the object, whereas others made ballistic arm movements in an attempt to reach it. Although all first reaches tended to be circuitous, the amount of correction made to obtain the object, the speed at which the attempt was made, and the angle at which arms were held differed across infants. These investigators concluded that the development of reaching represented more than development of eye-hand coordination; rather, in the simple act of reaching and grasping an object, the infant demonstrated (1) motivation to obtain the object, (2) ability to localize the object in space, (3) understanding that the

FIGURE 3-2 The infant explores a toy, assimilating its action and perceptual features.

object was reachable, (4) planning of the reach trajectory, (5) correction of the movement as the hand approached the toy, (6) lift and stabilization of the arm in space, and (7) successful grasp of the object. How a 5-month-old infant manages all of these components to reach and grasp a toy successfully varies among infants and for different reasons. Reach and grasp, as an example of developmental skill, is best understood as the outcome of the interaction of multiple systems, intrinsic and extrinsic to the child.

In a similar way, between 8 and 10 months of age, most infants acquire the motivation to be independently mobile. The need to self-initiate movement from place to place emerges as an important task, or goal, to accomplish. This goal reflects the infant's curiosity about the environment, a desire to explore space, and a determination to reach a specific play object. Although mobility becomes a common goal for the infant toward the end of the first year, the method used to achieve that mobility varies greatly. Some infants roll to another space in the room, whereas others scoot on their buttocks in a sitting position. Some infants push backward while lying in a prone position, and others creep forward to explore their environment. How the infant achieves mobility is influenced by many contributing body systems (e.g., strength, coordination, and sense of balance and movement).

Conditions in the environment also influence an infant's mobility (e.g., the surfaces on which the infant plays, the encouragement provided by caregivers, and the way in which the task is presented). The infant's energy level, motivation, and curiosity about the environment influence when independent mobility is achieved. In addition to the factors that influence the maturation of mobility skills, becoming mobile influences the development of skills in other performance domains. When an infant achieves mobility, he or she becomes more independent in initiating a social interaction or in seeking help. Independent mobility contributes to the acquisition of

social skills, self-determination, problem solving, and motivation to explore. A child learns perceptual skills, spatial relations, form perception, and object relations by moving through the environment.

Perceptual Action Reciprocity

Perception and action are interdependent and inextricably linked. This relationship is particularly observed in infants and is useful in understanding motor development. An individual's perception of the environment informs action, and the individual's actions provide feedback about movement, performance, and consequences in the environment. Initially, many of the child's actions are exploratory in nature—the child moves fingers over the surfaces of objects to learn their shape, texture, and consistency. The child waves an object in the air to hear the sounds it makes and feel its weight. These actions help the child perceive sensory and perceptual features (affordances) of objects. *Affordance* is the fit between the child and his or her environment.^{57,59,61} The environment and objects in it offer the child opportunities to explore and act. This action is based on what the environment affords as well as the child's perceptual capability to recognize affordances in that environment. For example, colorful noise-making toys afford manipulation because they have movable parts and rounded surfaces and fit easily into an infant's hand. Learning about affordances entails exploratory activities. Individual finger movements, thumb opposition, hand-to-hand transfer, and eye-hand coordination are facilitated by the physical characteristics of the toy.

Manipulation in the infant initially is guided by visual, tactile, and kinesthetic input.^{114,123} Exploration of objects begins with visual exploration and mouthing.¹¹⁵ By 6 months of age, infants prefer exploring with their eyes and hands.¹¹⁴ Fingering and manipulation skills increase substantially between 6 and 12 months of age, enabling infants to gather more precise information about objects. By 12 months of age, infants detect object properties with increasing specificity and learn to adjust their exploratory action.¹ For example, to perceive the consistency of a soft, squishy object, a child squeezes it, and to perceive the texture of velvet or corduroy, the child runs the fingers back and forth over it.

Through object manipulation, the child develops haptic perception (i.e., an understanding of shape, texture, and mass of objects). Table 3-1 explains perceptual-action reciprocity in the development of object manipulation. Bushnell and Boudreau¹⁹ propose that specific motor skills are required to

develop haptic perception. They note that infants learn to identify an object's sensory qualities (e.g., texture, consistency, temperature, contour) only when they develop the motor skills to explore each different sensory quality. For example, an infant does not accurately discriminate texture until he or she can explore texture by moving the fingers back and forth (at about age 6 months). The infant also cannot discriminate hardness until 6 months, when he or she can tighten and lessen the grip while holding an object.¹⁹ Because configural shape requires that two hands be involved in exploring an object's surfaces, children typically cannot accurately perceive shape until 12 months of age. By 2½ years, children can identify common objects through their haptic sense, and by 5 years, children recognize common objects using active touch (without vision).²⁵ By 5 years, the child has also fully developed in-hand manipulation skills,¹⁰⁷ suggesting that haptic perception develops in association with the child's development of manipulation skills. Maturation of haptic perception and manipulation underlies the child's ability to use tools for written communication (e.g., handwriting and keyboarding) and activities of daily living.

Functional Performance: Adaptive and Flexible

As mentioned, the infant begins life with few constraints on performance, which permits the greatest variability in the system for the generation of spontaneous movements. This variability permits flexibility for exploration of the environment and rapid perceptual and cognitive learning. The infant quickly selects functional synergistic movement patterns. For example, from birth, the infant demonstrates a pattern of hand-to-mouth movement (e.g., for self-calming by sucking on a fist) (Figure 3-3). Only minimal adaptive changes are made in this synergistic pattern (shoulder rotation and horizontal adduction, elbow flexion and forearm pronation, followed by supination and neutral wrist position) as the child learns to self-feed with various utensils.

Because synergies that enable tool use are softly assembled around the goal of the task at hand, they are stable but flexible units. Synergies have specific consistent characteristics, such as the sequence of movements and the ratio of joint movement, which can be adjusted to accommodate each new situation. This *adaptable stability* is a hallmark of normal movement.²⁹ Soft assembly is critical to allow the child to act in changing and variable environments. It also allows the child to explore and select a response to the environment because his or her

TABLE 3-1 Perceptual-Action Reciprocity in the Development of Perceptual and Object Manipulation Skills

Age	Perceptual Skill	Object Manipulation Skill
<6 months	Visually explores and mouths objects	Brings object to mouth
6-12 months	Explores object textures by moving fingers back and forth	Begins to extend and move fingers together
	Explores objects with eyes and hands	Fingers and manipulates objects
	Discriminates hardness of object	Can tighten and loosen grip while holding an object
12 months-3 years	Adjusts manipulation according to the object property	Moves an object from hand to hand
	Perceives object shape by moving between hands	Uses two hands to manipulate object
>3 years	Identifies common objects using haptic perception (active touch)	Begins to demonstrate in-hand manipulation skills
		Uses dynamic grasping patterns

FIGURE 3-3 Hand-to-mouth movement is observed throughout the first year, first for sensory exploration of the mouth and hand and then as a feeding behavior. (From Henderson, A., & Pehoski, C. [2006]. *Hand function in the child: Foundations for remediation* [2nd ed.]. St. Louis: Mosby.)

response patterns are variable and flexible.¹³¹ See Figure 3-4 for examples of fluid exploration of objects and a child exploring and manipulating shapes.

The functional synergies that characterize a child's development of occupations are highly adaptable and reliable. The child self-organizes these synergies around tasks and goals, and his or her first goals are embedded in and organized around play (as described later in this chapter).

How does a child learn new performance skills? Although learning new skills is not limitless and is constrained by biologic and contextual factors, human development is believed to have relative *plasticity*.⁸⁵ This concept has importance to occupational therapists, who provide intervention services designed to change and promote children's performance. Gottlieb⁶³ defines plasticity as a fusion of the organism (the child) and the environment (including its cultural, physical, and socioeconomic characteristics).⁶⁴ Individual development involves the emergence of new structural (e.g., cellular) and functional (e.g., body systems) components. The child's experiences produce new neurologic connections (i.e., new associations) and structural changes (e.g., physical growth), and the relationships among components, not the components themselves, are most important to development. Acknowledgment of the system's plasticity places the focus on the child's potential for change and on the contextual features that promote or limit the child's performance.

Stages of Motor Learning

How does motor competence develop during childhood? Children generally pass through three stages of learning to acquire a new skill.^{59,111,136} The first stage involves *exploratory activity*. The first year of life is primarily a period of sensorimotor exploration. Exploration occurs naturally in all human beings, generally when an individual is presented with a new object or task. Through exploration, a child learns about self and the environment. In this stage, the child experiments with objects and activities using different systems, new combinations of perception and movement, and new sequences of action. In this exploratory stage or when challenged by a new and difficult task, a child tends to demonstrate primitive movement. New

challenges tend to elicit lower levels of skills because these can be accessed more easily than the child's highest level skills, which demand more energy and effort.⁶⁶ By using lower level skills to address new problems, the child can focus on perceptual learning about the task before beginning to use higher level skills, which ultimately allow more success in performing the task. Gilfoyle, Grady, and Moore⁶² noted that when children are first challenged with a new and difficult performance task (e.g., a first step), they use primitive movement patterns (e.g., balance by stiffening the legs and trunk) before progressing to integrated skill.

In the second stage of learning, *perceptual learning*, the child begins to use the feedback and reinforcement received from his or her exploration. In this transitional stage, the child exhibits more consistency in the movement patterns used to accomplish tasks. Because this second stage is a phase of perceptual learning, certain actions that were tried initially are discarded as ineffective. Interest in the activity remains high as perceptual learning continues and is inherently motivating and meaningful to the child. In this stage, the child appears focused on learning and attempts activities multiple times. The child may fluctuate between higher and lower levels of skill. Connolly and Dalglish³³ found considerable variability when toddlers attempted to use a spoon. Greer and Lockman⁶⁸ found similar variability when 3-year-olds attempted to use a writing tool. See Figure 3-5 for an example of a transitional marker grip. At times, the children grasped the tool using an adult gripping pattern, and at other times, they used a primitive, full-hand grasp. Mature patterns are selected more often as children enter the third stage of skill learning.

In the third stage of learning, *skill achievement*, the child selects the action pattern that works best for achieving a goal. The pattern selected is comfortable and efficient for the child. Selection of a single pattern indicates both perceptual learning and increased self-organization. During this end stage of learning, the child demonstrates flexible consistency in performance. He or she uses the same pattern and approach to the task but easily adapts the pattern according to task requirements. High adaptability is always characteristic of a well-learned task. Another attribute of learned performance is the use of action patterns that are orderly and economical. Children continue to practice performance when given opportunities in the environment. The third stage of learning leads to exploration of new and different activities; a child's learning continues into new performance arenas, expanding his or her occupations (Figure 3-6).

For most children, new experiences and new learning are sought and are a source of pleasure. Learning occurs when children seek opportunities for skill development; it also occurs when children adapt to the natural environment and daily activities in which they participate. Ayres^{3,4} explains that children make adaptive responses to the environment. An adaptive response is one in which the child responds to an environmental change in "a creative or useful way" (p. 14).⁴ These adaptive responses allow skill mastery and help to organize the child's CNS. An adaptive response helps to integrate the child's sensory and perceptual systems to respond more skillfully to new challenges to the sensory system. For example, once an infant can pull herself up to her mother's lap to ask to be held, she no longer needs to cry to solicit her mother's attention.

FIGURE 3-4 The child's movement patterns in exploring objects and the environment are variables and flexible.

Social-Emotional Development

Theories on temperament, attachment, and emotion regulation explain how a child's social-emotional behaviors develop and how social-emotional function affects performance across domains. These theories explain individual differences among children based on genetic endowment and social environmental influences.

Emotions play an important part in the child's appraisal of his or her experience and in the child's readiness for action in response to contextual change. Emotions relate to how a child evaluates the meaning of an experience in relation to his

or her goals. If a child engages in an activity with the goal of succeeding but does not, the child may become disappointed or frustrated. If a child engages in an activity simply to participate and without expectation for success, he or she may experience pleasure regardless of success. Emotions and temperament influence the child's interest in attempting new activities, the amount of effort demonstrated, and attempts to engage others. These variables influence how a child approaches an activity (e.g., joyfully, reluctantly) and influence its social nature (e.g., whether the child solicits the involvement of others).

FIGURE 3-5 The child experiments with writing utensil grasping patterns.

Temperament

Temperament reflects relatively stable traits that influence how individuals process and respond to the environment. These characteristics contribute to personality and everyday functioning. The child's temperament is an important determinant in how well a child matches the caregiver and the caregiving environment.⁸⁶ Temperament also influences the child's style of social interaction. Nine areas of temperament have been identified: (1) activity level, (2) approach or withdrawal, (3) distractibility, (4) intensity of response, (5) attention span and persistence, (6) quality of mood, (7) rhythmicity, (8) threshold of response, and (9) adaptability. Each of these areas contributes uniquely to the child's preferences, interests, and style in forming social relationships and responding to the social environment.¹³⁷

Taken together, these areas of temperament have their own continuum. Extreme temperament levels are associated with

FIGURE 3-6 The infant's learning demonstrates high adaptability. The third stage of learning leads to exploration of new and different activities, expanding learning into new occupations.

problematic behaviors, and moderate levels are related to easy and appropriate behaviors. Children who exhibit extreme temperament characteristics (e.g., children who are highly active, moody, or irritable) have been identified as *difficult*. The difficult child may not fit with the expectations and schedules of caregivers. Others with happy moods and moderate intensity of response are considered *easy*. A child with an easy temperament may easily establish routines (exhibiting regular sleep/wake cycles) and have positive moods and may have a better fit with caregivers. A match of parent and child temperament can facilitate strong attachment, just as a mismatch can create difficulties in attachment.

TABLE 3-2 Emotion Regulation Development

Phases	Approximate Ages	Characteristics	Examples
Neurophysiologic modulation	Birth to 2-3 months	Modulation of arousal, activation of organized patterns of behavior.	Infant can self-soothe (e.g., with nonnutritive sucking) or respond quickly when soothed by parents. May be fussy, calm. Different routines of awake/sleeping cycles.
Sensorimotor modulation	3-9 months	Behavior depends on social or environmental stimuli or events.	Infant derives pleasure from sensorimotor play; infants seek sensory exploration. Some infants have difficulty modulating sensory behaviors (e.g., may be sensory seeking).
Control	12-18 months	Behavior demonstrates awareness of social demands. Toddler demonstrates compliance and self-initiated monitoring.	Toddler's behavior is goal-directed. May show different levels of inhibition and compliance according to understanding of consequences.
Self-control	24-48 months	Child's behaviors are in accordance with social expectations; developing a sense of identity. Behavior becomes more internally monitored.	Child demonstrates knowledge of social rules and conventions. Has limited flexibility in adapting to new demands. May visually check in with parent before acting.
Self-regulation	≥36 months	Child develops behavioral flexibility according to demands of the situation; develops strategies for managing different situations. Has self-awareness and can self-evaluate	Child may self-initiate clean-up. Adaptability increases, such that child can adapt to unexpected events (e.g., parent leaving for a long time), primarily because communication and language have increased.

Adapted from Kopp, C.B. (1982). Antecedents of self-regulation: A developmental perspective. *Developmental Psychology*, 18, 199–214.

Chess and Thomas^{27,28} asserted that if a child's characteristics provide a good fit (or match) with the demands of a particular setting, adaptive outcomes result. The congruence, or *goodness of fit*, between the child and his or her social and physical context determines the quality of development, influencing which occupations are reinforced and which are hindered. *Positive goodness of fit*, meaning that the social and physical environment support the child's skill development, can increase the child's developmental trajectory. Lack of goodness of fit can create disruption of psychological development and may put the child at risk for behavioral or academic problems.

To illustrate how temperament affects goodness of fit, children with arrhythmic, poorly regulated sleep/wake cycles were reported to be difficult to manage by European American families in which the parents worked and needed a consistent routine of sleeping patterns. Puerto Rican parents did not have difficulty in accommodating children with poorly regulated sleep/wake cycles because they molded their schedules around them and allowed their children to sleep when they wanted. In the Puerto Rican families, the incidence of child behavior problems was very low, particularly before school age when a school schedule was imposed.⁸⁵ These studies and many others suggest that the child's temperament and behavior affect goodness of fit between the caregiver and the child, which influences developmental outcomes.²⁸

Emotion Regulation

Emotion regulation is related to temperament and can be influenced by caregivers, the environment, and experience. It refers to the modulation of emotional reactions, including its inhibition, activation, and grading.¹²¹ Emotion regulation includes

the child's ability to control his or her emotions and use adaptive behaviors when frustrated or experiencing negative emotions, that is, "processes used to manage and change if, when and how intensely one experiences emotion and emotion-related motivational and physiological states and how emotions are expressed as behaviors."⁴⁰ Similar to other skill sets, emotion regulation increases with age and shifts from external sources of control to internal child factors. As presented in Table 3-2, a child's self-regulation of emotion emerges from socialization with primary caregivers and others and is linked to language and cognitive development. In early emotion regulation, physiologic and sensory modulation determines behavior; however, as toddlers learn self-control, between 2 and 3 years of age, the child's behaviors become more influenced by social demands. The self-control learned in the second and third years becomes more flexible and adaptable as rules are learned and remembered.⁸⁰ Children who have achieved self-regulation of emotions can use multiple strategies flexibly to cope with stressful events. For example, a child can shift attention away from a distressing event to decrease arousal or can focus attention on positive aspects of an event. A child's positive affect appears to increase emotion regulation, and children who have had frequent positive experiences appear better able to cope with negative experiences or stressful events.¹⁴⁰

Attachment as a Basis for Social-Emotional Development

One aspect of early social-emotional development, attachment to a primary caregiver, can potentially influence social relationships and intimacy throughout life. Attachment can be defined as a bond that develops between the infant and his or her

caregiver over the first year of life.^{12,14} Infants are genetically programmed to seek and maintain proximity to an attachment figure. In an early study of attachment, infants 2 to 4 months old orient to adults, grasping and reaching for them, smiling and babbling. They appear to have indiscriminate attachments and respond similarly to any caregiver. Infants increasingly orient to familiar persons after 3 months. Infants 3 to 6 months old actively seek proximity exclusively to familiar caregivers and use them as a secure basis from which to explore. Social responses are greater and more positive for familiar people, particularly primary caregivers. After 6 months, the infant prefers the primary caregiver with whom he or she has formed an attachment, and the infant develops separation anxiety, signaling that the relationship with the attachment figure has become more intense and exclusive. The primary caregiver becomes a base from which the infant explores. When the infant is mobile (1 to 2 years of age), he or she demonstrates attachment behaviors designed to maintain proximity to the attached parent. By age 3, the child has developed a greater understanding of what the parent means by stating that she will return soon. At this age, the child becomes more flexible about his or her relationship with attached caregivers.^{15,36}

Attachment to caregivers provides the child with an understanding of emotions and social relationships. Successful accomplishment of attachment results in a sense of security, and separation from the attachment figure leads to infant distress. Five patterns of attachment have been identified in infants: (1) a secure pattern that results from interactions with a caregiver who is sensitively responsive to the infant's signals, reading them accurately and responding appropriately; (2) an anxious pattern characterized by clinginess or need for constant reassurance, related to a parent who is excessively protective; (3) an insecure-avoidance pattern of minimal emotional expression related to a less responsive, slightly rejecting caregiver; (4) an insecure-ambivalent pattern related to a caregiver who appears to be overinvolved, inconsistent, or neglectful in his or her responses to the child; and (5) a disorganized pattern that

results from parents who are intrusive, withdrawn, negative, or abusive.^{15,17} A parent's (typically mother's) sensitive responses can heighten a child's positive emotions and inhibit negative emotions. Secure attachment facilitates a child's formation of a coherent and organized relationship with the parent, including an ability to predict the parent's responsiveness. These patterns suggest that the parent-child relationship has a primary role in a child's representation of his or her social world and that the attachment relationship shapes that child's understanding of self.¹⁵

Self-Identity and Self-Determination Development

Although attachment, temperament, and emotion regulation explain certain aspects of a child's social participation, other theories describe how self-identity and self-determination develop and contribute to participation. Erikson^{42,43} described the stages of psychosocial development as conflicts and explained that resolution of these conflicts directly influences the child's self-identity, motivation, and personality. Of equal influence at this time, Maslow⁹¹ developed a hierarchy of human needs to explain what motivates behavior and which needs must be met to reach self-actualization.

Self-Identity and Motivation

According to Erikson, the first stage that characterizes infants, birth to 1 year, is the development of trust.⁴³ Because the infant is dependent on caregivers in the first year, trust is based on dependability and responsiveness of caregivers. If the infant develops trust, he or she feels safe and secure; failure to develop trust results in fear and insecurity. Through the first four stages, children have opportunities to develop hope (trust), will (autonomy), purpose (initiative), and competence (industry). These qualities and virtues are important to the child becoming an occupational being. Erikson's psychosocial stages are defined in Table 3-3.

TABLE 3-3 Erikson's Psychosocial Stages, 0-12 Years

Stage/Age (Approximate)	Outcomes	Examples of Key Related Developmental Activities
Basic Trust vs. Mistrust Birth-2 years	Infant develops trust, believes the world is dependable. When parents are not sensitive or responsive, the infant becomes insecure, lacks trust, withdraws from others.	Infant is regularly fed; caregivers respond when he cries; caregivers give comfort when distressed.
Autonomy vs. Shame and Doubt 2-4 years	Child develops autonomy and will, attempts new challenges, becomes more self-sufficient. When parents are restrictive, the child can feel doubt and become reluctant to attempt new challenges.	Child feeds self, begins to dress self; becomes toilet trained; moves about the environment; caregivers support the child's performance, allow some choice.
Initiative vs. Guilt 4-5 years	Child begins to take initiative, plans activities, accomplishes tasks. When parents are dismissive, the child may feel ashamed or become overly dependent.	Child directs own play; attempts to assert control over others. Demonstrates imaginative and dramatic play.
Industry vs. Inferiority 5-12 years	Child develops a sense of pride in his accomplishments. Child strives to master new skills; when encouraged he develops a feeling of competence and self-confidence. When adults do not encourage, he does not believe in his skills and doubts that he will be successful. Child feels inferior.	Child participates in school and school-related activities. Social play and sports become important. Games, sports, and school work give the child opportunities to accomplish and demonstrate competence.

From Erikson, E.H. (1950). *Childhood and society*. New York: Norton.

Another psychologist who followed Erikson also developed a developmental hierarchy that explained how behaviors were based on a hierarchy of human needs. Maslow, sometimes considered the father of humanistic psychology in the United States,⁷⁰ outlined a hierarchy of basic human needs that is believed to follow a longitudinal sequence.^{91,92} An individual's most basic needs, those at the base of this hierarchy, are *physiologic needs*, such as food, water, rest, air, and warmth, that are necessary to basic survival. The next level is characterized by the *need for safety*, broadly defined as the need for both physical and physiologic security. The *need for love and belonging* promotes the individual's search for affection, emotional support, and group affiliation. The *need for a sense of self-esteem*, which is defined as the ability to regard the self as competent and of value to society, is evidenced as an individual grows. The *need for self-actualization*, which represents the highest level, is attained through achievement of personal goals.

Maslow proposed that each of these needs serves as a motivator to achieve a higher level of human potential. Throughout development, individuals must satisfy their most basic needs before they are motivated by or interested in other life goals. Foundational biologic and egocentric needs must be satisfied before an individual has social interests and can fully participate in social relationships. With important social relationships established, an individual becomes interested in the broader community and has a broader sense of commitment and responsibility to others within the community. If the lower level needs are not met, the individual is unable to direct his or her energies toward higher levels. For example, a child who comes to school hungry finds it difficult to concentrate on the classroom learning activities. Recognition of a child's needs and the hierarchy of development of these basic needs helps the occupational therapist understand behaviors that indicate that basic needs are not met and identify needs that should become the focus of goals and interventions.

Self-Efficacy and Self-Determination

Understanding what motivates action and learning and how children develop personal well-being has expanded since the time of Maslow. Concepts explaining what intrinsic and extrinsic factors influence a child's development of self-identity, personal well-being, and self-determination are well integrated into client-centered occupational therapy approaches. Bandura⁵ explained that children are inherently self-organizing and goal-directed; they typically have interest in new events and activities, initiate new tasks, and persevere in those tasks. When they succeed, positive self-efficacy is reinforced, and they attempt other challenges. When they do not succeed, they are at risk for developing poor self-efficacy and eventually do not attempt new or challenging activities. Self-efficacy is highly linked to learning and occupational development because it influences levels of motivation, initiative, and perseverance.⁵⁻⁷

Ryan and Deci¹²⁴ further developed the theory of self-efficacy by explaining that the key elements of self-determination are competence, autonomy, and relatedness. When children feel competent, they believe that if they persist in an activity, they will succeed. A child who has succeeded in performing is more likely to persist and to continue to succeed. A child who repeatedly fails when performing an activity may discontinue attempting it and may feel a sense of failure. Children who

perceive themselves to be autonomous are intrinsically motivated to explore, learn, perform well, persist, show interest, and act energetically. Children with high autonomy and intrinsic motivation are likely to be self-directed and to have high self-esteem and general well-being. When children are externally pressured to act, they lose initiative and learn less effectively.¹²⁵ Parents and occupational therapists who promote a child's autonomy and competence are likely to instill intrinsic motivation. Competence and autonomy appear to be linked, in that feelings of competence do not enhance intrinsic motivation unless accompanied by a sense of autonomy.¹²⁵ Autonomous, intrinsically motivated pursuits are characterized by curiosity, meaningfulness, interest, and enjoyment.

A third factor, relatedness, also influences the development of intrinsic motivation. For example, intrinsic motivation is easily observed in the exploratory behavior of infants, and it is most evident in infants who are securely attached to a parent. When children are asked to perform a task or learn a new behavior, they become more competent and successful in the presence of a caring adult or interested caregiver.¹²⁶ Secure relationships form a foundation for emotional growth, increased autonomy, and intrinsic motivation and, by extension, increased participation.

Occupational therapists assess and facilitate a child's inner motivation to engage in occupations (tasks with meaning and purpose). Children fully participate when the fit among child, task, and environment is optimal; this fit becomes the occupational therapist's goal.^{73,84} When a child has a disability, motivation to learn and attempt new activities may be lower, and the match among child, occupation, and environment may be sub-optimal. In this case, a child may not learn independently, and adult support may be needed to motivate, provide a just-right challenge, support actions, and reinforce performance. Self-determination and self-efficacy are of high importance to occupational therapists, who understand that intrinsic motivation underlies a child's interest in learning from the environment and in participating in occupations. Intrinsic motivation is discussed further in other chapters, including [Chapters 4, 12, and 25](#).

Resiliency

Children develop self-efficacy when they are raised in a supportive environment and learn that they are competent, autonomous, and supported by caregivers.¹¹¹ *Resiliency* refers to a child's internal characteristics that enable him or her to thrive and develop despite high-risk factors in the environment. The concept of resiliency emerged from studies of child development in which the context included risk factors known to have negative effects (e.g., child abuse, parental mental illness or substance abuse, socioeconomic hardship).^{142,146} A resilient child has protective factors that enable him or her to develop positive interpersonal skills and general competence despite stressful or traumatic experiences or social environments known to limit developmental potential (e.g., that of an adolescent, single parent). Both child protective factors (e.g., intelligence, prosocial behavior, and social competence) and family protective factors (e.g., material resources; love, nurturance, and sense of safety and security; quality of parent-child relationship) are important to positive child outcomes. Researchers have demonstrated that a high-quality relationship with at least one parent, characterized by high levels of warmth and openness

and low levels of conflict, is associated with positive outcomes across levels of risk and stages of development.¹⁴⁷

A child's *resiliency versus vulnerability* also seems to relate to basic physiologic and regulatory characteristics. Children with low cardiovascular reactivity and high immune competence cope better with stressful situations and are less vulnerable to illness when stressed.¹⁴⁶ In middle childhood, well-developed problem solving and communication skills are important to a child's ability to deal with stress. Resilient boys and girls tend to be reflective rather than impulsive, demonstrate an internal locus of control, and use flexible coping strategies in overcoming adversity.¹⁴⁶ In addition to intelligence and competence, emotional regulation—that is, being able to monitor, evaluate, and modify the intensity and duration of emotional reactions—is important to positive outcomes.¹⁴²

These concepts suggest that in the interpretation of the influence of environmental factors on a child's development, variables internal to the child can overcome negative contextual variables, including variables believed to have a profound influence (e.g., poor caregiving). Although the evidence suggests that children with strong resilience can overcome a high-risk environment (e.g., abusive situations, poverty), a research synthesis of risk and resilience studies found that both internal (e.g., child's intelligence, positive affect, emotional regulation) and contextual (e.g., supportive family relationships) protective factors are needed for positive outcomes (e.g., school success, positive relationships).¹⁴¹ Taken together, the theories that explain how children grow and develop into competent adults and full participants in the community suggest that a child's development of occupations must always be understood as an interaction between the child's biologic being and his or her cultural, social, and physical contexts.

Development of Occupations

Occupations can be defined as the “patterns of action that emerge through transaction between the child and environment and are the things the child wants to do or is expected to do” (p. 22).⁷³ Although most children accomplish certain occupations and their corresponding tasks in a known sequence, the way these tasks are accomplished is unique for each child. A child learns new occupations based on the facility that the child brings to the activity. Motor and praxis, sensory-perceptual, emotion regulation, cognitive, and communication and social skills contribute to occupational performance.² These skill areas are interdependent; that is, they work together in such a way that the strengths of one system (e.g., visual) can support limitations in others (e.g., kinesthetic). Which systems are recruited for a task varies according to the novelty of the activity and the degree to which the task has become automatic.

Eating a meal illustrates the interdependence of the above-described developmental areas. Research has shown that self-feeding using a spoon involves visual-perceptual, kinesthetic, visual-motor, and cognitive systems.^{32,55,71} Eating also relates to emotion regulation and social-emotional development.¹²⁷ As previously described, grasp of the spoon initially is guided by vision, and the child uses trial-and-error to hold the spoon so that he or she can scoop the food. With practice and maturation, grasp of the spoon is guided primarily by the kinesthetic system, and correct grasp becomes automatic; vision plays a

lesser role. When food is in the mouth, chewing skills require primarily oral motor skills and somatosensory perception of food texture and food location within the mouth. The skills involved in occupational performance vary not only according to the learning phase but also according to the child's learning preferences and styles. Eating also relates to emotion regulation that may affect whether or not the child approaches the spoon. A child may resist eating because of past negative experiences with food or mealtime, anxiety about new foods, need for highly structured routines at mealtime, and difficulty coping with the social demands inherent in a mealtime. The complexity of the occupation of eating, often viewed as a simple occupation, reveals the level of understanding and analysis required when a child experiences eating challenges.

Humphrey⁷³ suggests that children learn through both direct and indirect social participation. A young child often first learns about an occupation through observing parents, siblings, and other adults or peers. The first representational pretend play is typically imitation of the mother's actions when cleaning and cooking. Children imitate their parents' gestures and speech without being explicitly taught to do so. They also learn the consequences of actions by observing how their parents respond to each other or to their siblings. They can learn that an action is wrong by observing punishment of a peer for that action. Vicarious learning appears to be particularly important to a child's assuming cultural beliefs and values. Children learn the traditions and rituals of a culture by observing their family's participation in these. Inclusive models of education are believed to be effective learning environments for children with disabilities based on the known benefit of observing and interacting with typical peer models.^{37,38} When in a child's presence, occupational therapists should always be conscious that their actions and words influence children's learning and whether these actions are directed toward the child.

Learning is generally more vigorous when the child actively participates in an occupation. Children's play with each other is an integrated learning experience in which the child acts, observes, and interacts. Play involves most or all performance areas, including affective, sensory, motor, communicative, social, and cognitive. When children play together, they learn from, model for, challenge, and reinforce each other. This flow of interactions occurs in meaningful activities that generally bring pleasure and intrinsic reinforcement and enable learning.

To learn a specific skill, the child must actively practice it. Specific scaffolding, guidance, cueing, prompting, and reinforcement by an occupational therapist can assist the child in learning to perform a skill. This direct support from a caregiver or other adult can facilitate performance at a higher level or at a more appropriate level so that the fit between the child and desired occupations and context becomes optimal. In the case of a child with disabilities, a more intensive level of direct support and scaffolding may be necessary for learning new skills. Adult guidance and support of the child during play can facilitate a successful strategy, help the child evaluate his or her performance, and encourage and reinforce continued practice. Occupational therapists can also optimize the environment to support and reinforce the child's performance. Participation in play occupations in a natural environment results in integrated learning across performance areas (e.g., including sensory, motor, cognitive, and affective learning) (Figure 3-7).

Ecologic Models and Contexts for Development

Children develop occupations through participation in family activities and cultural practices. As a child participates in the family's cultural practices, the child learns occupations and performance skills that enable him or her to become a full participant in the community. Rogoff et al. explain, "People develop as participants in cultural communities. Their development can be understood only in light of the cultural practices and circumstances of their communities."¹¹⁶ Variations in the child's play activities (e.g., how he builds with wooden blocks, draws a picture of himself, or sings a song) reflect the child's biologic abilities and the influence of cultural, social, and physical contexts.

The ecologic model, developed by Bronfenbrenner,¹⁸ situates child development in the center of the child's community. In this model, children are most influenced by their families and their home environment, termed the microsystem.¹⁸ The child is also an integral part of a neighborhood and community, and this broader community has indirect but important influence by providing opportunities and cultural context for the child's development. Bronfenbrenner's ecologic model defines the importance of the physical and social context on child development and explains the interactions among family, cultural, and societal influences. The broadest influence on a child's occupations is the community in which the child is raised. Communities and society in general have invested in children's occupations by providing playgrounds, preschools, child-oriented music, child-oriented restaurants, and soccer fields. A community's orientation toward children determines available opportunities to play organized sports, learn about art and music, play safely in neighborhoods, and develop friendships with diverse peers. Communities that value organized sports and outdoor activities may have soccer or baseball teams, horseback riding, and swimming specifically designed for children with disabilities (e.g., Special Olympics, Miracle League Baseball, therapeutic horseback riding). Characteristics of the community become barriers or opportunities for the child and family and their desired occupations. As advocates for children with disabilities, occupational therapists can influence the development of programs that are accessible and appropriate for children with a wide range of abilities. They can emphasize the importance of supporting the participation of all children in community activities, recognizing the different levels of support and accommodation needed.

A child's cultural, social, and physical contexts change through the course of development and tend to expand as the child matures. The environment surrounds and supports the child's action; it also forces the child to adapt and assists or accommodates that adaptation. As a child perceives the affordances of the environment, he or she learns to act on those affordances, expanding a repertoire of actions. At the same time, the child's understanding of how the world responds to his or her actions increases. Rogoff^{116,117} argued that culture affects every aspect of the child's development, which cannot be understood outside this context. The child is nested in his or her family, culture, and community, which have influenced the child's genetic makeup and continue to provide the learning environment.¹¹⁷ By recognizing this influence, occupational

FIGURE 3-7 This child engages in meaningful play occupations based on his interest in airplanes in a natural environment (home).

The child's play and actions are always within a social, cultural, and physical context.¹¹² To understand the development of occupational performance, the occupational therapist must understand the child's play and actions as coherent occupations within specific contexts.

therapists view each child in his or her cultural context and work as change agents within that context.

Cultural Contexts

Cultural practices are the routine activities common to a people of a culture and may reflect religion, traditions, economic survival, community organization, and regional ideology. A child's learning is highly influenced by participation in these cultural practices. Reciprocally, the child's participation in the occupations and cultural practices of his or her family and community contributes to that community.

Cultures vary in many aspects, such as the roles of women and children, values and beliefs about family and religion, family traditions, and the importance of health care and education. The continuum of interdependence versus autonomy of individuals varies in cultural groups and is a significant determinant of childhood occupations. The value an ethnic group or a community places on interdependence among its members versus individual autonomy creates differences in child-rearing practices and different experiences for developing children.¹² Most middle-class European Americans value independence as a primary goal for their children. Parents in the United States encourage individuality, self-expression, and independence in their children's actions and thoughts. Families from Asian and Hispanic backgrounds often value interdependence and reliance on family members throughout the life span. Cultures that value interdependence over independence also value cooperation over competition. For example, children of Asian and Hispanic backgrounds have been found to be more cooperative in play than children from European American backgrounds.¹¹⁶

To illustrate, parents in the United States, in part to foster early independence in children, do not co-sleep with their infants; instead infants sleep in their own room or crib. Co-sleeping may be more common among cultures in which parents value interdependence, promote high reciprocity with their children, and encourage the primacy of family relationships.¹¹⁶ For example, it is prevalent across other societies in the world, such as Asia, Africa, and South America, where infants sleep in their parents' bed or room.¹⁴⁹ Mayan infants and toddlers sleep in the same room with their parents, often in the mother's bed.⁷⁵ Asian and Middle Eastern parents tend to sleep with their infants because they believe that these sleeping arrangements are important to nurturing and bonding. In the United States, co-sleeping is four times more common in Asian and African American families than in white families.¹⁴⁹ Close physical contact at night and into the day can foster interdependence within families.⁵⁶

One consequence of infants sleeping in their own crib, separated from their parents, is that middle-class U.S. parents often engage in elaborate and time-consuming bedtime routines (e.g., reading books, lullabies). Black and Hispanic parents are less likely to establish an interactive bedtime routine with their young children.⁶⁹ Parents of these ethnic groups may not value an interactive bedtime routine. In addition, a routine to separate at bedtime may not be needed when infants sleep with the parents. These examples briefly illustrate how cultural beliefs and values influence the ways parents raise their children.

Social Contexts

Culture influences the social relationships that envelop the child, yet certain aspects of the child's social context appear to

be independent of cultural influences and are consistent across cultures. The most important relationships formed during infancy are the relationships with parents or primary caregivers.¹⁰¹ When caregivers are sensitive and responsive to the infant, healthy social-emotional development results.^{39,87} Infants' interactions with parents serve to enhance the infants' basic physiologic and regulatory systems. When parents attune to the infant's sensory modulation and arousal needs and support these needs, the infant develops secure attachment. Mothers who modulate their behaviors to match their infants' needs for stimulation and comfort also promote the infants' abilities to self-regulate. A child's interaction with a caregiver gives the child essential information about how self and other are related, which becomes important to engaging in future relationships. Attachment patterns seem to influence the child's style of interaction and engagement in later years. Sensitive responding consolidates the infant's sense of efficacy and provides a foundation of security for confident exploration of the environment.^{39,101}

Csikszentmihalyi and Rathunde³⁵ describe parenting as a dance between supporting and challenging the child. Supporting the child enables him or her to assimilate or explore the environment—to play. Parental challenge requires a child to accommodate and conform. Parenting provides a combination of these supports and challenges. All parents use some measure of support to bolster children's attempts to master skills and some degree of challenge to move children toward higher levels of mastery.^{101,116} These elements are subtly provided by parents in the ways they present tasks and select when and how they instruct or intervene. Effective guidance relies on careful observation of the child's cues. Sensitivity and responsiveness to the child's needs appear to be among the most important variables in the promotion of child development.⁸⁵

In typical situations, infants receive care from multiple care providers, including childcare providers, grandparents, and other adults. The infant may or may not attach to caregivers other than the parents or primary caregivers; however, these social relationships are important to the infant's emotional development and provide opportunities for the development of social skills. About 55% of children 3 to 5 years of age participate in nonparent childcare, including center-based and family childcare.¹⁴¹ A study for the National Institute of Child Health and Human Development revealed that positive caregiving occurred when children were in small groups; child-to-adult ratios were low; caregivers did not use an authoritarian style; and the physical environment was safe, clean, and stimulating.¹⁰⁴ Family factors predicted child outcomes even for children who spent many hours in childcare. The family environment appears to have a significantly greater effect on a child's development than the childcare environment.^{47,88}

Physical Contexts

The physical environment surrounds and supports the child's actions; it forces the child to adapt his or her actions to meet the demands and constraints of the physical surroundings. As a child perceives the affordances of the environment, the child learns to act on those affordances, expanding a repertoire of actions. At the same time, the child's understanding of how the world responds to his or her actions increases. Gibson⁵⁸ explained how a child's exploration of physical surfaces and objects allows the child to develop and practice mobility and

manipulation skills. Examples of the interactions of a child and his or her physical environments and the developmental consequences are presented next.

Children's Occupations, Performance Skills, and Contexts

This section describes a child's development of play occupations as enabled by the child's performance skills and cultural, physical, and social contexts. For three age groups—infancy, early childhood, and middle childhood—typical play occupations and activities are described. The contribution of motor, sensory, emotional, cognitive, and social abilities and contexts to the development of play occupations is described. Although children's occupations are similar within a particular age level, the contexts, individual abilities, and activities are varied and diverse, resulting in a unique occupational performance for each child. Recognition of the uniqueness of a child's development and of how these components contribute to performance within individuals is key to analysis of occupational performance.

Although the child learns occupations other than play (e.g., occupations related to activities of daily living or school functions), occupational therapists are invested in play outcomes and most often use play activities to engage the child in the therapeutic process. Play activities serve as the means to improve performance because they are self-motivating and offer goals around which the child can self-organize.¹⁰⁶ Play also serves as the end or goal of therapy services.¹¹² Children put effort and energy into play activities because they are inherently interesting and fun. (A more detailed description of play as a goal and modality of therapy is provided in [Chapter 17](#).) Descriptions of a child's development of feeding, self-care, activities of daily living, instrumental activities of daily living, and school function are presented in other chapters (see [Chapters 14, 15, 16, and 23](#)). The child's ability to communicate, although essential to the development of play and other childhood occupations, is not specifically described in this chapter because language and communication are the domain of speech-language pathologists and are well described in many other texts.

Infants: Birth to 2 Years

Play Occupations

The play occupations of infants in the first 12 months are exploratory and social—they are related to bonding with caregivers ([Boxes 3-1 and 3-2](#)). As in every stage, these occupations overlap (e.g., bonding occurs during exploratory play with the parent's hair and face, and the parent's holding supports the infant's play with objects). Much of the infant's awake and alert time is spent in exploratory play, often play that occurs in the caregiver's arms or with the caregiver nearby.

Exploratory play is also called *sensorimotor play*. Rubin¹²¹ defined *exploratory play* as an activity performed simply for the enjoyment of the physical sensation it creates. It includes repetitive movements to create actions in toys for the sensory experiences of hearing, seeing, and feeling. The infant places toys in the mouth, waves them in the air, and explores their surfaces with the hands. These actions allow for intense perceptual learning and bring delight to the infant (without any more

BOX 3-1 Development of Play Occupations: Infants—Birth to 6 Months

Play Occupations

Exploratory Play

Sensorimotor play predominates

Social play

Focused on attachment and bonding with parents

Performance Skills

Regulatory/Sensory Organization

Quiets when picked up

Shows pleasure when touched and handled

Relaxes, smiles, and vocalizes when held

Cuddles

Listens to a voice

Uses hands and mouth for sensory exploration of objects

Fine Motor/Manipulation

Follows moving person with eyes

Develops accurate reach to object

Uses variety of palmar grasping patterns

Secures object with hand and brings to mouth

Transfers objects hand to hand

Examines objects carefully with eyes

Plays with hands at midline

Gross Motor/Mobility

Lifts head (3-4 months), raises trunk when prone (4-6 months)

Kicks reciprocally when supine

Sits propping on hands

Plays (bounces) when standing with support from parents

Rolls from place to place

Cognitive

Repeats actions for pleasurable experiences

Uses hands and mouth to explore objects

Searches with eyes for sound

Bangs object on table

Integrates information from multiple sensory systems

Social

Coos, then squeals

Smiles, laughs out loud

Expresses discomfort by crying

Communicates simple emotions through facial expressions

Data from Parks, S. (2007) *HELP Strands*. Palo Alto, CA: VORT Corp; Gesell, A., & Amatruda, G. (1947). *Developmental diagnosis* (2nd ed.). New York: Harper & Row.

complex purpose). [Research Note 3-1](#) explains Gibson's ecological theories on how the infant learns through exploration of object affordances.

In the second year of life, the infant engages in *functional*, or *relational*, play; an object's function is understood, and that function determines the action ([Boxes 3-3 and 3-4](#)). Initially, children use objects on themselves (e.g., pretending to drink from a cup or to comb the hair). These self-directed actions signal the beginning of *pretend play*.¹¹⁰ The child knows cause and effect and repeatedly makes the toy telephone ring or the battery-powered doll squeal to enjoy the effect of the initial action.

By the end of the second year, play has expanded in two important ways. First, the child begins to combine actions into play sequences (e.g., he or she relates objects to each other by stacking one on the other or by lining up toys beside each other). These combined actions show a play purpose that

BOX 3-2 Development of Play Occupations: Infants—6 to 12 Months

Play Occupations

Exploratory Play

Sensorimotor play evolves into functional play

Functional Play

Begins to use toys according to their functional purpose

Social Play

Attachment to parents and caregivers

Social play with parents and others

Performance Skills

Regulatory/Sensory Organization

Enjoys being held up in the air and moving rapidly through the air

Listens to speech without being distracted

Finger-feeds self, including a variety of food textures

Cooperates with dressing

Fine Motor/Manipulation

Mouths toys

Uses accurate and direct reach for toys

Plays with toys at midline; transfers hand to hand

Bangs objects together to make sounds

Waves toys in the air

Releases toys into container

Rolls ball to adult

Grasps small objects in fingertips

Points to toys with index finger, uses index finger to explore toys

Crudely uses tool

Gross Motor/Mobility

Sits independently

Rolls from place to place

Independently gets into sitting position

Pivots in sitting position

Stands, holding on for support

Plays in standing when leaning on support

Crawls on belly initially, then crawls on all fours (10 months)

Walks with hand held (12 months)

Cognitive

Responds to own name

Recognizes words and family members' names

Responds with appropriate gestures

Listens selectively

Imitates simple gestures

Looks at picture book

Begins to generalize from past experiences

Acts with intention on toys

Takes objects out of container

Social

Shows special dependence on mother

May show stranger anxiety

Lifts arms to be picked up

Plays contentedly when parents are in room

Interacts briefly with other infants

Plays give and take

Responds playfully to mirror (laughs or makes faces)

Data from Parks, S. (2007). *HELP Strands*. Palo Alto, CA: Vort; Linder, T. (2008). *Transdisciplinary play-based assessment* (rev. ed.). Baltimore: Brookes; Gesell, A., & Amatruda, G. (1947). *Developmental diagnosis* (2nd ed.). New York: Harper & Row.



RESEARCH NOTE 3-1

Gibson, E.J. (2000). *Perceptual learning in development: Some basic concepts*. *Ecological Psychology*, 12, 295–302.

Gibson eloquently presents her theory of perceptual learning in this research synthesis. These concepts can explain early perceptual-motor development:

- Infants learn by exploring their environment and selecting the movements that optimally fit environmental affordances.
- Through perception of objects and their surfaces, shapes, actions, and function, the infant learns which movements are most effective and efficient for exploring and activating the object.
- When the infant grasps an object in view and brings it to his mouth, he learns what is within reaching distance, how long his arm is, how large the object is, how much it weighs when transported, and how it feels in his mouth. From this action, the infant learns how far he needs to extend his arm, how much force is needed to hold the object, and how to turn the object to bring it to his mouth. The result is the infant selects the most efficient movements and action for reaching, grasping, and mouthing an object.
- The infant quickly learns that proprioceptive information from his arm in carrying an object to his mouth matches perfectly visual information from watching the object travel to his mouth. This match of visual and proprioceptive information is redundant and invariant, allowing the infant to select only one sensory system to guide his movements, and he generally selects the proximal sensory (proprioceptive) system as the most efficient.
- Economy of action and reduction of perceptual information are principles that the infant uses to develop coordinated and efficient movements.
- These principles of perceptual-motor reciprocity can be easily observed in the refining of grasping patterns and actions applied to objects in the first 2 years of life.

matches the function of the toy. Second, 2-year-old children now direct actions away from themselves. The objects used in play generally resemble real-life objects.⁸⁶ The child places the doll in a toy bed and then covers it. The child pretends to feed a stuffed animal or drives toy cars through a toy garage. At 2 years of age, play remains a very central occupation of the child, who now has an increased attention span and the ability to combine multiple actions in play. The emergence of *symbolic*, or *imaginary*, play with toys and objects offers the first opportunities for the child to practice the skills of living.¹⁰²

The child also engages in gross motor play throughout the day. As the child becomes mobile, exploration of space, surfaces, and large action toys becomes a primary occupation. Movement is enjoyed simply as movement; the child delights in swinging and running or attempting to run and moving in water or sand. Deep pressure and touch are craved and requested. As in exploratory play, the child's exploration of space involves simple, repeated actions in which the goal appears to be sensation. Often, extremes in sensation seem to be enjoyed and are frequently requested. Repetition of these

BOX 3-3 Development of Play Occupations: Infants—12 to 18 Months

Play Occupations

Relational and Functional Play

Engages in simple pretend play directed toward self (pretend eating, sleeping)

Links two or three schemas in simple combinations

Demonstrates imitative play from an immediate model

Gross Motor Play

Explores all spaces in the room

Rolls and crawls in play close to the ground

Social Play

Begins peer interactions

Parallel play

Performance Skills

Regulatory/Sensory Organization

Enjoys messy activities

Reacts to extreme sensations, such as warm, cold, sweet

Fine Motor/Manipulation

Holds crayon and makes marks; scribbles

Holds two toys in hand and toys in both hands

Releases toys inside containers, even small containers

Stacks blocks and fits toys into form space (places pieces in board)

Attempts puzzles

Opens and shuts toy boxes or containers

Points to pictures with index finger

Uses two hands in play, one to hold or stabilize and one to manipulate

Gross Motor/Mobility

Sits in small chair

Plays in standing

Walks well, squats, picks up toys from the floor

Climbs into adult chair

Flings ball

Pulls toys when walking

Begins to run

Walks upstairs with one hand held

Pushes and pulls large toys or boxes on floor

Cognitive

Acts on object using variety of schemas

Imitates model

Symbolic play with real props (e.g., pretends to drink with cup)

Understands how objects work

Understands function of objects

Uses trial-and-error in problem solving

Recognizes names of various body parts

Social

Moves away from parent

Shares toys with parent

Responds to facial expressions of others

Play Occupations

Functional Play

Multischema combinations

Performs multiple related actions together

Gross Motor Play

Enjoys sensory input of gross motor play

Pretend or Symbolic Play

Makes inanimate objects perform actions (dolls dancing, eating, hugging)

Pretends that objects are real or that they symbolize another object

Social Play

Participates in parallel play

Imitates parents and peers in play

Participates in groups of children

Watches other children

Begins to take turns

Performance Skills

Regulatory/Sensory Organization

Enjoys solitary play for a few minutes

Uses Play-Doh

Enjoys rough and tumble play

Fine Motor/Manipulation

Completes 4- to 5-piece puzzle

Builds towers (e.g., 4 blocks)

Holds crayon in fingertips and draws simple figures (straight stroke or circular stroke)

Strings beads

Begins to use simple tools (e.g., play hammer)

Participates in multipart tasks

Turns pages of book

Gross Motor/Mobility

Runs, squats, climbs on furniture

Climbs on jungle gym and slides

Moves on ride-on toy without pedals (kiddy car)

Kicks ball forward

Throws ball at large target

Data from Parks, S. (2007). *HELP Strands*. Palo Alto, CA: Vort; Linder, T. (2008). *Transdisciplinary play-based assessment* (rev. ed.). Baltimore: Brookes; Gesell, A., & Amatruda, G. (1947). *Developmental diagnosis* (2nd ed.). New York: Harper & Row.

FIGURE 3-8 Gross motor fun of a 2-year-old.

BOX 3-5 Emergence of Self-Efficacy

Infants develop an initial sense of efficacy through cause-and-effect actions (e.g., crying brings adult attention). Infants who experience success in controlling environment events become more attentive to their own behavior and more competent in learning. In addition to seeing the effects of their actions, infants develop self-efficacy when they can differentiate themselves from others. Infants learn that their actions produce effects different from others' actions, and they begin to perceive themselves as distinct selves, differentiated from others.⁶ When parents make remarks, such as "look what Audrey did, isn't she cute," or "You are such an ornery baby," the infant gains self-knowledge and begins to understand that she is a distinct individual. From this knowledge, self-efficacy emerges.

From Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28, 117–148.

occupations are critical foundations to later occupations that involve social relating and demonstration of emotions. At 1 year of age, infants play social games with parents and others to elicit responses. As the toddler gains competence and is supported by parental responsiveness, he or she gains a sense of personal agency and self-efficacy. See [Box 3-5](#) for an example of how Bandura⁶ explains the emergence of self-efficacy early in life. Although infants at this age engage readily with individuals other than family, they require their parents' presence as an emotional base and return to them for occasional emotional refueling before returning to play.¹³⁸

By the second year, children exhibit social play in which they imitate adults and peers. Imitation of others is a first way to interact and socially relate.⁸ Both immediate and deferred imitation of others are important to social play as children enter preschool environments and begin to relate to their peers.

Performance Skills

Sensory Functions

The newborn can interpret body sensations and respond reflexively. He enjoys and needs a consistent caregiver's physical contact and tactile stimulation. The neonate turns his head

FIGURE 3-9 In prone position, the infant shifts his weight from side to side when playing with toys; later he learns to pivot while prone to expand where he can reach and what he can visualize.

when touched on the cheek, relaxes in his mother's arms, and expresses discomfort from a wet diaper. Self-regulation of sleep/wake cycles, feeding, and display of emotions and arousal emerge in early infancy. The infant molds himself to the parent's embrace, clinging to the parent's arms and chest. The newborn's vestibular system is also quite mature as he calms from rocking and enjoys the motion of a parent walking him about the room. The neonate demonstrates orientation and attention to visual, auditory, and tactile stimuli. An important fact is that the newborn also exhibits *habituation*, or the ability to extinguish incoming sensory information (e.g., ability to sleep by blocking out sound in a noisy nursery). [Chapter 9](#) further describes sensory development of infants and young children.

Gross Motor and Mobility

The first movements of newborns appear to be reflexive; however, on closer examination, they reveal the ability to process and integrate sensory information. The neonate's movements contribute to perceptual development and organization and initiate his learning about the world. In the first month of life, the infant moves the head side to side when in a prone position and rights the head when supported in sitting. By 4 months, the prone infant lifts the head to visualize activities in the room. This ability to lift and sustain an erect-head position appears to relate to the infant's interest in watching the activities of others as well as improved trunk strength and stability. As the infant reaches 6 months, he or she demonstrates increased ability to lift the head and trunk when in a prone position to visualize the environment. When prone, the infant can also move side to side on the forearms, then on the hands ([Figure 3-9](#)). When supine, the infant actively kicks and brings the feet to the mouth. Over the next 6 months, this dynamic, postural stability prepares the infant to become mobile.

Rolling is normally the infant's first method of becoming mobile and exploring the environment. Initially, rolling is an automatic reaction of body righting; usually the infant first rolls from the stomach to the side and then from the stomach to the back. By 6 months, the infant rolls sequentially to move across the room. Heavy or large infants may initiate rolling

several months later, and infants with hypersensitivity of the vestibular system (i.e., overreactivity to rotary movement) may avoid rolling entirely.

Most infants enjoy supported sitting at a very early age. As their vision improves in the first 4 months, they become more eager to view their environment from a supported sitting position. By 6 months, they are able to sit up without support.

After experimenting with pivoting and backward crawling in a prone position, the 7-month-old infant crawls forward. The infant may first attempt belly crawling using both sides of the body together. However, reciprocal arm and leg movements quickly emerge as the most successful method of forward progression. Crawling in a hands-and-knees posture (sometimes called *creeping*) requires more strength and coordination than belly crawling. The two sides of the body move reciprocally. In addition, shoulder and pelvic stability are needed for the infant to hold the body weight over the hands and knees. Mature, reciprocal hands-and-knees crawling also requires slight trunk rotation (Figure 3-11). Through the practice of crawling in the second 6 months of life, the child develops trunk flexibility and rotation. Most 10- to 12-month-old infants crawl rapidly across the room, over various surfaces, and up and down inclines.

Infants at 5 and 6 months of age delight in standing, and they gleefully bounce up and down while supported by their parents' arms. The strong vestibular input and practice of patterns of hip and knee flexion and extension are important to the development of full upright posture after 1 year. The infant also prepares for a full upright posture by standing against furniture or the parent's lap. A 10-month-old infant practices rising and lowering in upright postures while holding onto the furniture. By pulling up on furniture to standing, the infant can reach objects previously unavailable. This new level of exploration and increase in potential play objects motivates infants to practice standing and motivates parents to place breakable objects on higher shelves (Figure 3-12). At 12 months, the infant learns to shift the body weight onto one leg and to step

FIGURE 3-10 **A**, In dynamic sitting, the infant has sufficient postural stability to reach in all directions. **B**, By 10 months of age, the infant easily moves into and out of sitting positions.

to the side with the other leg. The infant soon takes small steps forward while holding onto furniture or the parent's finger.

The infant's first efforts toward unsupported forward movement through walking are short, erratic steps with a wide-based gait and arms held in high guard. All these postural and mobility skills contribute to the infant's ability to explore space and obtain desired play objects. By 18 months, the infant prefers

walking to other forms of mobility, but balance remains immature, and the infant falls frequently. The infant continues to use a wide-based gait and has difficulty with stopping and turning. However, infants remain highly motivated to practice this new skill because walking brings new avenues of exploration and a sense of autonomy, and the parent must now protect the infant from objects that previously could not be reached and from spaces that have not yet been explored.

Fine Motor and Manipulation

The newborn moves the arms in wide ranges, mostly to the side of the body. In the first 3 months, the infant contacts objects with the eyes more than with the hands. By age 3 months, the infant follows his mother's face in a smooth arc, crossing midline. By 1 to 2 months of age, an infant learns to swipe at objects placed at his or her side. This first pattern of reaching is inaccurate, but by 5 months, the accuracy of reaching toward objects increases greatly.¹¹⁹ The infant struggles to combine grasp with reach and may make several efforts to grasp an object held at a distance. As postural stability increases, the infant also learns to control arm and hand movements as a means of exploring objects and materials in the environment. By the time an infant is 6 months old, direct unilateral and bilateral reaches are observed, and the infant smoothly and accurately extends the arm toward a desired object.¹⁴³ Table 3-4 describes how the stages of motor learning are exemplified by the development of reach and grasp.

Grasp changes dramatically in the first 6 months (Figure 3-13). Initially, grasping occurs automatically (when anything is placed in the hand) and involves mass flexion of the fingers as a unit. The object is held in the palm rather than distally in the fingers or fingertips. Infants 3 to 4 months of age squeeze objects within their hands, and the thumb does not appear to be involved in this grasp. At 4 to 5 months of age, the infant exhibits a palmar grasp in which flexed fingers and an adducted

FIGURE 3-12 Supported stance is a favorite play position for infants 8 to 11 months old.

TABLE 3-4 Stages of Motor Learning for Reach and Grasp

Stage/Age	Motor Pattern
Reach	
I. Exploratory 1-3 months	Swipes at objects, reach is inaccurate; infant cannot combine reach and grasp.
II. Perceptual learning/ transitional stage 3-6 months	Reaching becomes more accurate, becomes more direct; infant reaches to midline. By 6 months, combines reach and grasp with two hands.
III. Skill achievement/adaptability and flexibility 6-9 months	Reaches with one or two hands; accurate and direct reach; can change direction of reach midstream. By 8-9 months, infant can reach in all directions. Reach is smooth and efficient. Infant easily combines reach and grasp. Infant carries object through space.
Grasp	
I. Exploratory 3-5 months	First voluntary grasp begins between 2 and 3 months. Infant squeezes object with all fingers, thumb does not participate. Release is random, without voluntary control. Grasp is inefficient and infant cannot move object in his hand.
II. Perceptual learning/ transitional stage 6-12 months	Radial palmar and radial digital grasping patterns emerge. Infant actively uses thumb to grasp objects. Infant is unable to move an object within his hands but can transfer hand to hand and explore in his mouth. Voluntary release begins at 6-7 months. Infant awkwardly prehends small objects.
III. Skill achievement/adaptability and flexibility 12 months-2 years	By 12 months, infant demonstrate a pincer grasp; this grasp is precise by 18 months. By 18 months, demonstrates precision release. By 2 years, grasp is dynamic, allowing tool use; the child can use an object while holding it (toothbrush, spoon). Blended grasping patterns develop—the child can move an object while maintaining his grasp of the object.

B

FIGURE 3-13 A and B, Grasping patterns evolve from palmar grasp without active thumb use (A) to radial digital grasp (B). C, At 4 months, the infant holds the object tight against the palm, with all fingers flexing as a unit. D, At 8 months, the infant holds objects in the radial digits.

thumb press the object against the palm (Figure 3-13, C). At 6 months, the infant uses a radial palmar grasping pattern in which the first two fingers hold the object against the thumb. This grasp enables the infant to orient the object so that it can be easily seen or brought to the mouth (Figure 3-13, D). The infant secures small objects using a raking motion of the fingers, with the forearm stabilized on the surface.

Grasp continues to change rapidly from 7 to 12 months.^{22,34} A radial digital grasp emerges in which the thumb opposes the index and middle finger pads. At approximately 9 months, wrist stability in extension increases, and the infant is better able to use the fingertips in grasping (e.g., the infant can use fingertips to grasp a small object, such as a cube or cracker). By holding objects distally in the fingers, the infant can move the object while it is in the hand; movement of objects within the hands allows the infant to explore them and use objects for functional purposes. A pincer grasp, with which the infant holds small objects between the thumb and finger pads, develops by 10 to 11 months. A 12-month-old infant uses various grasping patterns, often holding an object in the radial fingers and thumb.

The infant may also grasp a raisin or piece of cereal with a mature pincer grasp (i.e., the thumb opposes the index finger).

In the second year of life, grasping patterns continue to be refined. The child holds objects distally in the fingers, where holding is more dynamic. By the end of the second year, a tripod grasp on utensils and other tools may be observed. Other grasping patterns may also be used, depending on the size, shape, and weight of the object held. For example, tools are held in the hand using first a palmar grasp and then a digital grasp. Blended grasping patterns develop toward the end of the second year, allowing the child to hold a tool securely in the ulnar digits while the radial digits guide its use.

Voluntary release of objects develops around 7 to 8 months of age. The first release is awkward and is characterized by full extension of all fingers. The infant becomes interested in dropping objects and practices release by flinging them from the highchair. By 10 months of age, objects are purposefully released into a container, one of the first ways the infant relates separate objects. As the infant combines objects in play, release becomes important for stacking and accurate placement. For

example, the play of 1-year-old children includes placing objects in containers, dumping them out, and beginning the activity again.

By 15 to 18 months of age, the infant demonstrates release of a raisin into a small bottle and the ability to stack two cubes. Stacking blocks is part of relational play because the infant now has the needed control of the arm in space, precision grasp without support, controlled release, spatial relations, and depth perception. The infant can also place large, simple puzzle pieces and pegs in the proper areas. At the same time, the infant acquires the ability to discriminate simple forms and shapes. The infant's learning of perceptual skills is supported by improved manipulative abilities, and increased perceptual discrimination promotes the infant's practice of manipulation.¹⁰⁷ Perception of force increases, enabling the infant to hold an object with the just-right amount of pressure (e.g., so cookies are not crushed before eaten).

The complementary use of both hands to play with objects develops between 12 months and 2 years. During this time, one hand is used to hold the object, while the other hand manipulates or moves the object. It is not until the third year that children consistently demonstrate use of two hands in simultaneous, coordinated actions (e.g., using both hands to string beads or button a shirt).⁴⁴

Cognitive

In the first 6 months, the infant learns about the body and the effects of its actions. Interests are focused on the actions with objects and the sensory input these actions provide. The infant's learning occurs through the primary senses: looking, tasting, touching, smelling, hearing, and moving. The infant enjoys repeating actions for their own sake, and play is focused on the action that can be performed with an object (e.g., mouthing, banging, shaking), rather than the object itself.⁸⁶ By 8 to 9 months of age, the infant has an attention span of 2 to 3 minutes and combines objects when playing (e.g., placing a favorite toy in a container). At this age, children begin to understand object permanence; that is, they know that an object continues to exist even though it is hidden and cannot be seen.³⁰ They can also find a hidden sound and actively try to locate new sounds.

By 12 months of age, the infant's understanding of the functional purpose of objects increases. Play behaviors are increasingly determined by the purpose of the toy, and toys are used according to their function. The infant also demonstrates more goal-directed behaviors, performing a particular action with the intent of obtaining a specific result or goal. Tools become important at this time because the infant uses play tools (e.g., hammers, spoons, shovels) to gain further understanding of how objects work. At the same time, the infant begins to understand how objects work (e.g., how to activate a switch or open a door).

In the second year, the child can put together a sequence of several actions, such as placing small "people" in a toy bus and pushing it across the floor. The sequencing of actions indicates increasing memory and attention span. Some of the first sequential behaviors illustrate the child's imitation of parent or sibling actions; increased ability to imitate and increased play sequences appear to develop concurrently (Figure 3-14).

Social

The infant's emotional transition from the protective, warm womb to the moment of birth is a dramatic change. The primary purpose of the newborn's system is to maintain body

FIGURE 3-14 This 1½-year-old boy engages in social play, imitating an adult, sequencing action, taking turns, and demonstrating understanding of object permanence on self.

functions (i.e., cardiovascular, respiratory, and gastrointestinal systems). However, as the infant matures, the focus shifts to increasing competence in interaction with the environment. The sense of basic trust or mistrust becomes a main theme in the infant's affective development and is highly dependent on the relationship with the primary caregivers. According to Erikson,⁴² the first demonstration of an infant's social trust is observed in the ease with which he or she feeds and sleeps (see Table 3-3).

The basic trust relationship has varying degrees of involvement. Parent-infant bonding is not endowed but is developed from experiences shared between parent and child over time. These feelings are seen in the progression of physical contact between parent and infant. The infant shows a differentiated response to the parent's voice, usually quieting and calming. Although infants are capable of crying from birth, they begin to express other emotions by 2 months, such as smiling and laughing.

By 5 to 6 months, the infant becomes very interested in a mirror, indicating a beginning recognition of self. By 4 to 5 months, he or she vocalizes in tones that indicate pleasure and displeasure. In the second year of life, the parents (or caregivers) remain the most important people in the child's life. The 2-year-old infant likes to be in constant sight of the parents and expresses emotions by hugging and kissing them.

TABLE 3-5 Development of Emotion Regulation and Related Social Behaviors

Age	Emotion Regulation	Social Interaction Skills
0-12 months	Self-soothes Learns to modulate reactivity Regulates attention Relies on caregiver for support during stressful situations	Discriminates others' expressions Shows expressive responsiveness to stimuli Demonstrates different facial expressions
12-30 months	Shows increasing self-awareness Shows emerging consciousness of own emotional responses Can be irritable because of constraints and limits imposed when desiring to explore	Expresses self-consciousness, shows shame, pride, coyness Understands more language and more emotions Expresses affective state

Adapted from Saarni, C. (1999). *The development of emotional competence* (pp. 18–19). New York: Guilford Press; Kopp, C. (1982). Antecedents of self-regulation: A developmental perspective. *Developmental Psychology*, 18, 199–214.

Although toddlers practice their autonomy around parents, they have no intention of giving up reliance on them and may become upset or frightened when the parents leave. Children at age 2 are interested in other children, but they tend to watch them rather than verbally or physically interacting with them. In a room of open spaces, 2-year-olds are likely to play next to each other. Their side-by-side play often involves imitation, with few verbal acknowledgments of each other. As discussed in the section on [emotion regulation](#), [Table 3-5](#) describes how the development of emotion regulation influences social interaction during infancy.

Contexts of Infancy

Cultural Contexts

The family's cultural beliefs and values influence caregiving practices and determine many of the child's earliest experiences. Breastfeeding practices influence the infant's development. Breastfeeding and bottle-feeding practices vary across different cultures and ethnic groups. In the United States, breastfeeding rates in the first 6 months for all ethnic groups is 73%; however, among women of Hispanic background, it is 80%, and among black mothers, it is 54%. Hispanic mothers tend to seek breastfeeding advice from their families; in contrast, white mothers tend to rely on advice from their health care providers.²⁴ In the United Kingdom, black and Asian mothers have the highest breastfeeding rates compared with white mothers.⁷⁷ Culture (as well as education) interacts with race and ethnicity in determining breastfeeding rates. Factors that contribute to a woman's decision to breastfeed include social and cultural norms, social support, guidance and support from health care providers, work environment, and the media,^{24,88} illustrating Bronfenbrenner's ecological model of social influences. The mother's decision to breastfeed can affect the child's nutrition, health, eating habits, and growth.

Race and ethnicity also influence how attentive parents are, how often they hold the infant,⁵⁰ how quickly a crying infant is consoled,¹³⁹ and many other aspects of infant caregiving.¹³ For example, Chinese parents are often very attentive, carrying and holding their infants throughout the day, even during naps. When infants are not held, they are kept nearby and picked up immediately if they cry.²⁶

Physical Contexts

Although many infants have a supplemental play area in a childcare center, the home provides the infant's first play

environment. The crib is often a play environment, providing a place for comforting toys (e.g., music boxes, colorful mobiles). Other early play spaces include a playpen, infant seat, and swing. The infant also spends time playing on the floor's carpeted surface or on a blanket. Because the infant is not yet mobile, safety is not as much of a concern as it will be in the next 2 years of life. Early play also occurs in the parent's or caregiver's arms. Exploratory play and attachment occupations are pursued on the parent's lap, and the infant is fascinated by the parent's face and clothing. At the same time, the infant feels safe and comforted by the parent's presence.

In the second 6 months, the infant requires less support to play, and a major role of the parent becomes one of protector from harm. As the infant becomes more mobile, spaces are closed, and objects now within reach are removed. Exploration of all accessible spaces becomes an infant's primary goal.

In the second year of life, the child's environment may expand to the yard, to neighbors' homes and yards, and to previously unexplored spaces in the home. Most children have opportunities for play in their home's yard or in the fenced-in areas of their childcare centers. Although the child's increasing interest in visiting outdoor spaces provides important opportunities for sensory exploration, it also creates certain safety concerns. Parents invest in gates and other methods of restricting the child's mobility to safe areas.

Early Childhood: Ages 2 to 5 Years

Play Occupations

The three types of play that predominate in early childhood are (1) *pretend*, or *symbolic play*; (2) *constructive play*; and (3) *rough-and-tumble*, or *physical play* ([Boxes 3-6](#) and [3-7](#)). Similar changes are observed in each type of play. First, the child's play becomes more elaborate—the child now combines multiple steps and multiple schemas. Short play sequences become long scripts involving several characters or actors in a story.^{79,86} Second, play becomes more social. The preschool-age child orients play toward peers, involving one or two peers in the story and taking turns playing various roles. When preschool-age children play with peers, the interaction appears to be as important as the activity's goal. As the child approaches 5 years of age, all play becomes increasingly social, generally involving a small group of peers.^{79,132}

Beginning at 2 years of age and continuing through the early childhood years, the child's play is symbolic and imaginative.

BOX 3-6 Development of Play Occupations:
Preschoolers—24 to 36 Months**Play Occupations****Symbolic Play**

Links multiple schema combinations into meaningful sequences of pretend play

Uses objects for multiple pretend ideas

Uses toys to represent animals or people

Plays out drama with stuffed animals or imaginary friends

Plays house, assigning roles to others, taking on specific roles

Constructive Play

Participates in drawing and puzzles

Imitates adults using toys

Gross Motor Play

Likes jumping, rough-and-tumble play

Makes messes

Social Play

Associative, parallel play predominates

Performance Skills**Regulatory/Sensory Organization**

Handles fragile items carefully

Enjoys interesting tactile surfaces

Plays with water and sand

May experience difficulty with transitions

Fine Motor/Manipulation

Snips with scissors

Traces form, such as a cross

Colors in large forms

Draws circles accurately

Builds towers and lines up objects

Holds crayon with dexterity

Completes puzzles of 4-5 pieces

Plays with toys with moving parts

Gross Motor/Mobility

Rides tricycle

Catches large ball against chest

Jumps from step or small height

Begins to hop on one foot

Cognitive

Combines actions into entire play scenario (e.g., feeding doll, then dressing in nightwear, then putting to bed)

Shows interest in wearing costumes; creates entire scripts of imaginative play

Matches pictures

Sorts shapes and colors

Plays house

Social

Cooperative play, takes turns at times

Shows interest in peers, enjoys having companions

Begins cooperative play and play in small groups

Shy with strangers, especially adults

Engages in dialog of few words

Can be possessive of loved ones

Data from Parks, S. (2007). *HELP Strands*. Palo Alto, CA: Vort; Linder, T. (2008). *Transdisciplinary play-based assessment* (rev. ed.). Baltimore: Brookes.

The child pretends that dolls, figurines, and stuffed animals are real. The child may also imitate the actions of parents, teachers, and peers. At ages 3 and 4, pretend play becomes more abstract, and objects, such as a block, can be used to represent something else. Pretend play now involves many steps that relate to each other. Children develop scripts as a basis for their play (e.g., one

BOX 3-7 Development of Play Occupations:
Preschoolers—3 to 4 Years**Play Occupations****Complex Imaginary Play**

Creates scripts for play in which pretend objects have actions that reflect roles in real or imaginary life

May use complex scripts for pretend sequences; portrays multiple characters with feelings

Constructive Play

Creates art product with adult assistance

Works puzzles and blocks

Rough-and-Tumble Play

Enjoys physical play, swinging, sliding board at playground, jumping, running

Social Play

Participates in circle time, games, drawing, and art time at preschool

Engages in singing and dancing in groups

Associative play: plays with other children, sharing and talking about play goal

Performance Skills**Fine Motor/Manipulation**

Uses precision (tripod) grasp on pencil or crayon

Colors within lines

Copies simple shapes; begins to copy letters

Uses scissors to cut; cuts simple shapes

Constructs three-dimensional design (e.g., 3-block bridge)

Manipulates objects within the hand

Gross Motor/Mobility

Jumps, climbs, runs

Begins to skip and hop

Rides tricycle

Stands briefly on one foot

Alternates feet walking upstairs

Jumps from step with 2 feet

Cognitive

Uses imaginary objects in play

Makes dolls and action figures carry out roles and interact with other toys

Categorizes and sorts objects

Shows a sense of humor

Social

Attempts challenging activities

Prefers play with other children; group play replaces parallel play

Follows turn-taking in discourse and is aware of social aspects of conversation

Shows interest in being a friend

Prefers same-sex playmates

Data from Knox, S. (2008). Development and current use of the Knox Preschool Play Scale. In L. D. Parham & L. Fazio (Eds.), *Play in occupational therapy for children* (2nd ed., pp. 55–70). St. Louis: Mosby; Folio, M. R., & Fewell, R. R. (2000). *Peabody Developmental Motor Scales* (rev. ed.). Austin, TX: Pro-Ed.

child is the father and one is the mother). They base these scripts on real-life events and play their roles with enthusiasm and imagination, creating their own stories and enjoying the power of their imaginary roles (Figure 3-15). Their dramatic play is quite complex at this time. However, when they are in small groups, their interaction with their peers seems to be more important than the play goal, and they can easily turn to new activities suggested by one member of the group.

Play Occupations**Games with Rules**

Begins group games with simple rules
 Engages in organized play with prescribed roles
 Participates in organized gross motor games such as kickball or "duck, duck, goose"

Constructive Play

Takes pride in products
 Shows interest in the goal of the activity
 Constructs complex structures

Social Play/Dramatic Play

Participates in role play with other children
 Participates in "dress up"
 Tells stories
 Continues with pretend play that involves scripts with imaginary characters

Performance Skills**Fine Motor/Manipulative**

Draws using a dynamic tripod grasp
 Copies simple shapes
 Completes puzzles of up to 10 pieces
 Uses scissors to cut out squares and other simple shapes
 Colors within the lines
 Uses two hands together well, one stabilizing paper or object and the other manipulating object
 Draws stick figure or may begin to draw trunk and arms
 Copies own name
 Strings small beads

Gross Motor/Mobility

Jumps down from high step; jumps forward
 Throws ball
 Hops for long sequences (4-6 steps)
 Climbs on playground equipment, swinging from arms or legs
 Throws ball and hits target
 Skips for a long distance
 Walks up and down stairs reciprocally

Cognitive

Understands rules to a game
 Remembers rules with a few reminders
 Makes up stories that involve role playing few

FIGURE 3-15 Pretend play of this 4-year-old focuses on his interests.

By 5 years of age, this imaginary play is predominantly social, as small groups of two and three join in cooperative play. A 5-year-old child engages in pretend play about one third of the time.¹²² However, this pretend play is based on imitation of real life and dressing up to play certain roles (e.g., firefighter, police officer, ballerina). Although children of this

age demonstrate some understanding of adult roles, they erroneously assume that roles are one-dimensional (e.g., a firefighter has one role, that of putting out fires). Through pretending, children develop creativity, problem solving, and an understanding of another person's point of view (Boxes 3-8 and 3-9).¹²⁹ Case Study 3-1 presents an example of applying Vygotsky's theories to a preschooler's learning the skills that support pretend play.

BOX 3-9 Development of Play Occupation: Kindergartners—5 to 6 Years**Play Occupations****Games with Rules**

Board games
Computer games
Competitive and cooperative games

Dramatic Play

Elaborate imaginary play
Role plays stories and themes related to seasons or occupations
Emphasis is on reality
Reconstructs real world in play

Sports

Participates in ball play

Social Play

Participates in group activities
Organized play in groups
Goal of play (winning) may compete with social interaction at times

Performance Skills**Fine Motor/Manipulation**

Cuts with scissors
Prints name from copy
Copies triangle; traces diamond
Completes puzzles of up to 20 pieces

Traces letters, begins to copy letters

Manipulates tiny objects in fingertips without dropping
Uses two hands together in complementary movements

Gross Motor/Mobility

Hops well for long distances
Skips with good balance
Catches ball with two hands
Kicks with accuracy
Stands on one foot for 8-10 seconds

Cognitive

Reasons through simple problems
Bases play more on real life than on imaginary world

Participates in organized games

Uses complex scripts in play

Demonstrates deferred imitation

Sorts objects in different ways

Copies elaborate block structures

Social

Participates in groups of two to four that play in organized, complex games

Has friends (same sex)

Enjoys singing and dancing; reflects meaning of words and music

Demonstrates understanding of others' feelings

**CASE STUDY 3-1****Example of Vygotsky: Scaffolding and the Zone of Proximal Development**

Sarah is a 4-year-old girl with autism spectrum disorder. She demonstrates age-appropriate development in motor skills; however, she has difficulty with motor planning and sequencing a series of movements. Her communication, play, and activities of daily living skills appear to be at a 2-year-old level. She also has difficulty with perceptual skills and often confuses concepts such as up-down, right-left, and spatial awareness. Teresa, an occupational therapist, selected a dress-up activity to promote Sarah's self-care, self-identity, and pretend play development. Teresa, who has collaborated with the speech-language pathologist, also tries to elicit simple questions and use of action verbs in this play scenario.

Teresa sets up the activity by inviting Sarah to come explore the large bin of dress-up clothes in the preschool classroom. As Teresa holds up a fireman's jacket and a doctor's coat, she asks Sarah to identify the top and bottom and to state what part of the body it fits. When Teresa asks Sarah what she wants to be ("Would you like to be a princess, a nurse, a superhero?"), Sarah's pretend skills are not sufficiently developed to choose. Teresa suggests that she be a princess, wearing a gown, princess shoes, and a crown. Teresa asks, "How will you get on your gown?" Sarah is hesitant, so Teresa points to the top and bottom, shows the zipper, and indicates that she can step into the gown. Sarah hesitates, and Teresa holds her hand to encourage her to step into the gown. She verbally cues her to slide her arms through the sleeves and models the action with an imaginary dress. Physical assistance is unnecessary as Sarah dons the gown with this cueing.

Throughout the activity, Teresa helps Sarah learn and integrate body awareness, saying, "Where are your toes? Let me see your hands and fingers." When Sarah has her gown, shoes, and crown on, Teresa suggests that she dance in front of a mirror to see how the gown flows and to imagine being a princess. They parade through the preschool classroom so that the other children can see her gown. When it is time to go outside and Sarah must take off the gown, Teresa decides to allow Sarah to sequence the undressing activity without verbal or physical cueing. She kneels by Sarah, prepared to help or give guidance, but knowing that undressing is easier, she hopes that Sarah can accomplish it on her own. Although Teresa begins the zipper, Sarah removes her princess clothing independently. Teresa reminds her of top and bottom, right and left during the undressing to reinforce those concepts.

Although this is a simple play scenario, common in preschool classrooms, Teresa has applied principles of Vygotsky's theories. She selected an activity within Sarah's proximal zone of development that she could achieve with a minimal amount of support. Teresa was prepared at each step to provide assistance (e.g., physical assistance in donning), but she first observed what support was needed to give the just-right amount of support. She promoted Sarah's development of pretend play, self-care, and self-identity by selecting an appropriate activity, providing just-right cues and guidance, and reinforcing perceptual concepts.

FIGURE 3-16 Children enjoy reading and writing activities at school. Molly is proud of her first book!

Play that involves building and construction also teaches the child a variety of skills during early childhood. At first, these skills are demonstrated in the completion of puzzles and toys with fit-together pieces (Figure 3-16). However, with mastery of simple pegs and puzzles, the child becomes more creative in construction. For example, a 4-year-old child can develop a plan to build a structure with blocks and then carry out the steps to complete the project. With instructions and a model, a 5-year-old child can make a simple art project or create a three-dimensional design. A 5-year-old child can also put together a 10-piece puzzle. The final product has become more important, and the child is motivated to complete it and show others the final result. The planning and designing involved in building and construction play help the child acquire an understanding of spatial perception and object relationships. This activity also appears to be foundational to academic performance in school.

Children 2 to 5 years of age are extremely active and almost always readily engage in rough-and-tumble play. They continue to delight in movement experiences that provide strong sensory input. Activities such as running, hopping, skipping, and tumbling are performed as play without any particular goal. Although rough-and-tumble play generally involves other children, it is generally noncompetitive and rarely organized. Children enjoy this activity for the simple, simultaneous pleasure of movement as they play together.²³

In associative physical play, children are generally more interested in being with other children than in the goal of the activity. However, some children enjoy primarily social play,

whereas others enjoy solitary play. These differences do not relate to ability as much as they relate to preferences and temperament.¹³⁸

Performance Skills

Gross Motor and Mobility

Young children are amazingly competent individuals, and their repertoire of motor function leaps forward during the preschool years (see Performance Skills in Boxes 3-6, 3-7, 3-8, and 3-9). By age 2 years, the child walks with an increased length of stride and an efficient, well-coordinated, and well-balanced gait. Although children begin to run by 2 years, they do not exhibit true running (characterized by trunk rotation and arm swing) until 3 to 4 years of age. The 4-year-old child demonstrates a walking pattern similar to that of an adult. By 5 to 6 years of age, the mature running pattern has developed, and children test their speed by challenging each other to races.

As mobility develops, children gain access to spaces previously unavailable to them. By 2 years of age, a child walks up stairs without holding onto a parent's hand, and at 2½ years, the child can walk down stairs without support. A child 3½ years old walks up and down stairs by alternating the feet and without needing to hold onto a rail.

Running and stair climbing become possible, in part, because the child's balance and strength increase. Emerging balance can be observed as the 2-year-old child briefly stands on one foot to kick a ball. By 5 years of age, the child can balance on one foot for several seconds and walk on a curb without falling.⁴⁹ Between 3 and 5 years, the child may successfully attempt to use skates or roller blades.

Jumping is first observed in 2-year-old children. This skill requires strength, coordination, and balance. By 3 years of age, the child can jump easily from a step. Hopping requires greater strength and balance than jumping and is first observed at 3½ years. Skipping is the more difficult gross motor pattern because it requires sequencing of a rhythmic pattern that includes a step and a hop. A coordinated skipping pattern is not observed until 5 years of age.⁷⁸

A 2-year-old child can begin to pedal a tricycle and move small riding toys. By 3 years of age, the child can pedal a tricycle but may run into objects. A 4-year-old child can steer and maneuver a tricycle around obstacles.

By 2½ years, most children can catch a 10-inch ball. This pattern of maturity enables the 4-year-old child to catch a much smaller ball, such as a tennis ball, successfully.⁴⁹ The first pattern of throwing involves a pushing motion, with the elbow providing the force for the throw. The 4-year-old child demonstrates more forward weight shift with throwing, increasing the force of the ball and the distance thrown. Kicking emerges in the 2- to 3-year-old child, with accurate kicking to a target exhibited by 6 years of age. Ball skills become increasingly important as the child begins participating in organized sports during the primary grades.

Fine Motor and Manipulation

Early childhood is a time of rapid improvement in fine motor and manipulation performance. By 4 years of age, children learn to move small objects efficiently within one hand (i.e., in-hand manipulation). A 4-year-old child can hold several small objects in the palm of the hand while moving individual pieces with the radial fingers.¹⁰⁷ In-hand manipulation indicates that isolated finger movement is well controlled and that the

thumb easily moves into opposition for pad-to-pad prehension. These skills also indicate that the child can modulate force and that he or she has an accurate perception of the gentle force needed to handle small objects with the fingertips.¹⁰⁷

With efficient in-hand manipulation, the preschool child also learns the functional use of drawing and cutting tools. Most 3-year-old children hold a pencil with a static tripod grasp (i.e., with the pencil resting between the thumb and first two fingers) and use forearm and wrist movement to draw; however, by 5 years, a child demonstrates a mature, dynamic tripod. In this grasp pattern, the pencil is held in the tips of the radial fingers and is moved using finger movement. By controlling the pencil using individual finger movements, the child can make letters and small forms.

Drawing skills progress from drawing circles to lines that intersect and cross in a diagonal (e.g., an X). The 5-year-old child can draw a person with multiple and recognizable parts. Drawing is often a strong interest at this age and contributes to the child's imaginative play.¹⁴⁸ He or she can also draw detailed figures created in the imagination (i.e., monsters, fairies, and other fanciful creatures) (Table 3-6).

The development of scissors skills follows the development of controlled pencil use. The first cutting skill, observed at 3 years, is snipping with alternating full-finger extension and flexion. Between 4 and 6 years, bilateral hand coordination, dexterity, and eye-hand coordination improve, enabling the

child to cut out simple shapes. Mature use of scissors is not achieved until 5 to 6 years because it requires isolated finger movements, simultaneous hand control, and well-developed eye-hand coordination for cutting accuracy.^{49,103}

Other fine motor skills acquired during the preschool years are important to the child's constructive and dramatic play. Activities such as putting puzzles together, building towers, stringing small beads, using keys, and cutting out complex designs usually require dexterity, bilateral coordination, and motor planning.

Cognitive

Preschool-age children create symbolic representations of real-life objects and events during play. In addition, they begin to plan pretend scenarios in advance, organizing who and what are needed to complete the activity. Play becomes an elaborate sequence of events that is remembered, acted out, and later described for others. For example, the child may act out the role of an adult, imitating action remembered from an earlier experience. This form of role play demonstrates the child's understanding of how roles relate to actions and how actions relate to each other (e.g., the child may role play a grocery store clerk, displaying items for sale, taking money from the customer, and placing the money in a toy cash register).

Abstract thinking begins in the preschool years as the child pretends that an object is something else. For example, the

TABLE 3-6 Dynamical Systems Theory Perspective on Development of Drawing Skills (4-6 Years)

Stages of Drawing Development	
Age	Developmental Skills
2-3 years	Makes scribbling marks on paper that are without symbolic meaning (exploratory phase). Repetitious marks.
3-4 years	Interprets drawing after it has been produced. Shapes emerge from scribbling.
4-5 years	Draws an image, draws with intent a picture that represents an object, person, or event. Has shapes and distinct elements, may be disordered, incorrect sizing, but has some semblance to intent.

Dynamical Systems Influencing Drawing Skill, 3-5 Years

Performance	Intrinsic Factors (Individual)	Extrinsic Factors (Environment)
Dynamic grasp of pencil or marker	Haptic perception of pencil in hand. Moves object in hand while holding (efficient intrinsic muscle use). Demonstrates dynamic tripod grasp.	Experience holding different drawing utensils, e.g., crayons, markers. Experience drawing on different surfaces. Experience in manipulating small objects, e.g., puzzles, blocks, small figurines.
Eye-hand coordination	Visual acuity. Visual perception. Motor coordination. Coordination of arm, hand, and finger action.	Experience in eye-hand coordination, e.g., stringing beads, stacking, puzzles. Available colors, contrasts, lighting, sizing of drawing utensils.
Draws shapes	Motor planning skills. Visual motor coordination.	Experience moving through the environment, handling objects with different shapes. Available colors, contrast, shapes in 2 and 3 dimensions. Cues from adults or others. Feedback from adults.
Draw figures and forms	Motor planning skills. Spatial relation skills.	Cues that guide drawing, e.g., models, examples. Adult reinforcement. Available color, lighting, surfaces, utensils.
Drawing represents an action, person, object, or event	Cognitive skills of attributing symbolic meaning, demonstrating representational thinking.	Play opportunities. Adult guidance. Peer models. Experience with books, pictures, stories, art.

From Ziviani, J., & Wallen, M. (2006). The development of graphomotor skills. In A. Henderson & C. Pehoski (Eds.), *Hand function in the child* (2nd ed., pp. 217–238). St. Louis: Mosby.

child may pretend a block is a doll bed; later the same block may become a telephone receiver or a train car.

In construction play (e.g., constructing train sets or building castles with Lego blocks), the child discriminates object size and shape. Building in three dimensions also requires spatial understanding and problem-solving skills. When building from a set of blocks, the child usually must first categorize and organize the blocks. Next, the child must solve the problem of how to fit them together to replicate a model or create the imagined structure.

In a similar way, the emergence of drawing skills reflects cognitive abilities, motor planning, and perceptual skills. The 3-year-old child makes crude attempts to represent people and objects in drawings. By 4 years of age, a child can draw a recognizable person, demonstrating the ability to select salient features and represent them on a two-dimensional surface. The 4-year-old child not only identifies the parts of a person but also relates them correctly, although the size of the parts is rarely proportional to real life. At 5 years, the child's drawing is more refined, more realistic, and better proportioned. By this age, pictures begin to tell stories and reflect the child's emotions (see Table 3-6).^{86,148}

Social

In early childhood, interaction and play with peers take on increasing importance. Children become social beings and identify themselves as individuals (i.e., separate from parents). Autonomy dominates psychosocial development from 2 to 4 years as the toddler shows his or her independence by moving away from the parent. The child is adamant about making personal decisions. The development of trust in the environment and improvements in language bring forth control over self, strengthening the child's autonomous nature.

The discovery of the body and how to control it promotes independence in self-care. Success in acting independently instills a sense of confidence and self-control. The child also begins to perceive that now all of his independent actions meet the approval of adults. See previous section on self-identity development.

Children need to achieve a balance between initiative to act independently and the responsibility they feel for their own actions. Children 4 to 5 years old explore beyond the environment, discovering new activities. They seek new experiences for the pleasure of learning about the environment and for the opportunities they offer for exploration. If the child's learning experiences are successful and effective and his or her actions meet parental approval, a sense of initiative is developed. Through these activities, the child learns to question, reason, and find solutions to problems.

Adult-child relationships and early home experiences also influence later peer relations. According to research, children whose attachments to their mothers are rated as secure tend to be more responsive to other children in childcare settings. They are also more curious and competent.⁸⁰ Peer play becomes an important avenue for the child's development of social and cognitive abilities. With their peers, they practice social roles, engage in dramatic play, and enjoy rough-and-tumble play.¹⁰⁹

The development of autonomy provides a foundation for the child's imagination. The young child explores the world not only through the use of his or her senses but also by thinking and reasoning. Although play can be reality based, it usually

includes fantasy, wishes, and role play. Words, rhymes, and songs also complement this type of play.¹⁰⁸

Contexts

Cultural and Social Contexts

The social roles of young children are influenced by cultures, ethnicity, and community. In the United States, the importance of interaction with peers is stressed at young ages. Most American children begin to interact with their peers (same age group) at about 3 years of age. Same-age peers become increasingly important through elementary school and dominate the social life of a teenager. In the United States and much of the world, children are grouped exclusively by age. These age groupings may provide more opportunities for play, but they also diminish opportunities for older children to teach and nurture younger children. Younger children have fewer opportunities to imitate older children.

Children in other parts of the world play and socialize with people of different ages. Cultural influences on social play behaviors are time and space to play, access to objects and materials, adult behavior and attitudes, and the availability of play partners.⁴⁵ For example, in Hispanic communities, children spend almost all of their time with siblings and other young relatives of a wide range of ages and primarily play with family members, including extended family. They socially participate in mixed-age groups, playing "on the edge" and watching intently until they can join in the play. Toddlers play with children of various ages, and they often play with older siblings. This "enduring social network" remains in place over time to care for, teach, and discipline children to adulthood.¹¹⁶ When children spend their days with people of various ages, they have many opportunities to imitate and learn from older children and adults. Interaction with children of varying ages provides older children the opportunity to practice teaching and nurturance with young children and provides young children the opportunity to imitate older children.¹⁴⁸

At very young ages, Mayan children play within their parents' work activities.¹¹ For example, children engage in play activities while helping their mothers wash clothes. The children's play in the Mayan culture is tolerated during daily work activities but is not specifically encouraged.¹¹ Bazyk and colleagues¹¹ found that children's work was playful, blurring the European American distinction between work and play. When children play in work activities, they are learning skills that will serve them well in adulthood. In contrast, the age-based groupings used in U.S. childcare centers and preschools provide children with opportunities to play with same-age peers but reduce their opportunities to play within adult work activities.

Families in the United States specifically design and encourage their children's play and at times become playmates with children. Although play is emphasized as the primary occupation for young children, children demonstrate interest in helping parents accomplish their work. Parents may encourage young children (e.g., 5 to 6 years old) to participate in household tasks, such as picking up their own toys. When children begin school, parents usually expect them to participate more in household tasks such as cleaning and meal preparation (see Chapter 16).⁸³

Physical Contexts

By the age of 5, a child's outdoor environment has expanded beyond the areas around the home and childcare center. A

variety of outdoor environments offer space for rough-and-tumble play, and expanded social and physical environments give the child new opportunities for learning (and generalizing) the skills he or she has achieved. Although adult supervision remains essential, the entire neighborhood may become the child's playground.

The availability of new indoor environments is also to be expected. Preschool classrooms usually have centers for different types of activities (e.g., creating art, listening to stories, playing games). In addition, community groups often sponsor a variety of indoor activities (e.g., preschool gymnastics, organized play programs) in which the child can participate.

Expanded environments offer children the opportunity to adapt play skills learned at home to the constraints of new spaces. For example, the child who climbs and slides down the stairs at home learns to climb a 6-foot ladder and slide down the slide in the neighborhood park. Parks and playgrounds also provide the child with new surfaces that challenge balance and equipment that offers intense vestibular experiences.

Cultural and socioeconomic differences can influence a child's physical environment. Inner-city parents frequently confine their children to the immediate household and forbid them to go outside after school, particularly to play. These protective strategies limit children's exposure to dangerous neighborhood influences, but they also restrict the physical context available for play.^{20,51,144,145}

Most preschool-age children also enjoy spending time in quiet spaces. Quiet spaces can be organizing and calming after a day in a childcare center (Figure 3-17). Based on sensory preferences, arousal levels, and activity levels, other children may seek stimulating environments that are full of activity, or they may create their own high activity in an otherwise quiet space.

When placed in new environments, children often respond by instinctively exploring the new spaces (e.g., hallways, cupboards, corners, furniture). Exploring the features of an environment can help orient children to the spaces that surround them, promote perceptual learning, and provide an understanding of the play possibilities in that environment.

FIGURE 3-17 Children enjoy pretend play and creating fun games that may challenge balance, strength, postural stability, and coordination.

Middle Childhood: Ages 6 to 10 Years

Play Occupations

Although 6-year-old children continue to enjoy imaginative play, they begin increasingly to structure and organize their play. Box 3-10 describes Piaget's classification of games that correspond to stages of cognitive development. By the time a child is 7 or 8 years old, structured games and organized play predominate (Box 3-11). *Games with rules* are the primary mode for physical and social play. Groups of children organize themselves, assign roles, and explain (or create) rules to guide the game they plan to play. The goal of the game now competes with the reward of interacting with peers, and children become fascinated with the rules that govern the games they play.

At 7 or 8 years of age, children do not understand that rules apply equally to everyone involved in the game, and they are often unable to place the rules of the game above the personal need to win.⁴⁸ However, breaking the rules may incur the criticism of peers, who also acknowledge the importance of rules at this time. By 9 and 10 years of age, children are more conscientious about obeying rules. They also learn to negotiate the rules of a game and construct their own rules.

BOX 3-10 Piaget's Stages of Cognitive Development as Expressed in Children's Games

Dimitri's Favorite Games

Dimitri, who is 5 years old, loves games, and although he has spastic diplegia cerebral palsy, he fully engages in games that match different cognitive levels as defined by Piaget.

Practice (Sensorimotor Exploratory) Games

Dimitri loves to wrestle with his brother on the living room rug. In this game, Dimitri pulls his 7-year-old brother to the floor. Mostly they roll on top of each other vying for the top position. This game does not have rules or structure, and, most often, the wrestling ends without a victor, when Dimitri tires or his mother intervenes.

Symbolic Games

Dimitri also loves playing with his dinosaurs, doing battles, roaming for food, and running over hills and valleys in the sandbox. The dinosaurs can talk and often bargain with each other for dominion of the sand mountain. This game also lacks structure. Dimitri plays with his friend Samuel or alone, and the dinosaurs' play scenarios are often the same.

Games with Rules

Dimitri also plays "Go Fish" and "Candyland" with his brother. Dimitri knows most of the rules, plays cooperatively and takes turns, and knows how the game ends. At 5, he does not always figure out when his older brother breaks the rules to gain the lead in the game.

Although these classifications of play reflect different cognitive levels, children play at all three levels over an extended period of time.

These play categories also have different goals and outcomes for the child's performance across developmental domains. All three play categories can be social play, object play, or both.

From Parham, L.D. (2008). Play and occupational therapy. In L.D. Parham & L.S. Fazio (Eds.), *Play in occupational therapy for children*. St. Louis: Mosby.

BOX 3-11 Development of Play Occupations:
Middle Childhood—6 to 10 Years**Play Occupations****Games with Rules**

Computer games, card games that require problem solving and abstract thinking

Crafts and Hobbies

Has collections

May have hobbies

Organized Sports

Cooperative and competitive play in groups or teams of children

Winning and skills are emphasized

Social Play

Play includes talking and joking

Peer play predominates at school and home

Plays with consistent friends

Performance Skills**Fine Motor/Manipulation**

Good dexterity for crafts and construction with small objects

Bilateral coordination for building complex structure

Precision and motor planning evident in drawing

Motor planning evident in completion of complex puzzles

Gross Motor/Mobility

Runs with speed and endurance

Jumps, hops, skips

Throws ball well at long distances

Catches ball with accuracy

Cognitive

Abstract reasoning

Performs mental operations without need to try physically

Demonstrates flexible problem solving

Solves complex problems

Social

Cooperative, less egocentric

Tries to please others

Has best friend

Is part of cliques

Is less impulsive, is able to regulate behavior

Has competitive relationships

Children who are 8 or 9 years old become interested in sports, and parents are generally supportive of sports activities. Although a form of play, organized sports can assume a serious nature (i.e., intrinsic motivation and the internal sense of control are overridden by the external demands of practice and serious competition with peers). In addition to organized sports, physical play is a favorite interest, including climbing, rollerblading, skipping rope, and skateboarding (Figure 3-18).

Interest in creating craft and art projects continues into middle childhood. During this time, the child shows an increased ability to organize, solve problems, and create from abstract materials. However, the completion of craft and art projects continues to require the support of adults to organize materials and identify steps. The final product, which is relatively unimportant to younger children, is now valued. Computer play and video games are popular and may dominate play in middle childhood into adolescence (see Chapter 4).¹²⁸

In middle childhood, children play in cooperative groups and value interaction with their peers. Increasingly, social

FIGURE 3-18 Favorite play activities for all children include swimming, ball play, and outdoor sports.

contact is virtual, through e-mail, texting, and social media websites. When friends come together, almost all activity is play and fun. Simply talking and joking become playful and entertaining. Children spend more than 40% of their waking hours with peers.³¹ In these peer groups, children learn to cooperate but also to compete.⁴⁸ They are now interested in *achievement* through play; they recognize and accept an outside standard for success or failure and criteria for winning or losing. With competition in play comes risk taking and strategic thinking. Children who compete in sports and other activities exhibit courage to perform against an outside standard.¹¹³

Performance Skills**Gross Motor and Mobility**

During the elementary school years, gross motor development reflects the refinement of previously acquired skills with increases in speed, precision of movement, and strength. To achieve this refinement, children spend hours in repetition of favorite physical activities, including sports, to attain mastery. Children ride bicycles, scale fences, swim, skate, and jump rope (Figure 3-19). Although motor capabilities are highly varied for this age group, balance and coordination improve throughout the middle childhood years, providing children with the agility to dance and play sports with proficiency. Research indicates that children who struggle with physical skills have lower self-esteem and are very socially marginalized.⁹⁰ Not only does self-esteem improve as children master physical skills, but also peer acceptance improves.

Fine Motor and Manipulation

By middle childhood, children become increasingly efficient in tool use (e.g., scissors, tweezers) and demonstrate precise drawing skills. Children handle and manipulate materials (fold, sort, adhere, cut) with competency. The drawing skills of 8- and 9-year-old children demonstrate appropriate proportions and accuracy, and handwriting skills improve in speed and accuracy as children learn manuscript and then cursive writing.⁶⁵ These improvements provide evidence of increased dexterity and coordination. Construction skills, manipulation, and abilities to use tools continue to generalize across performance areas, with increases in speed, strength, and precision.

FIGURE 3-19 Children enjoy playing and swimming at the beach.

Cognitive

In middle childhood, concepts and relationships in the physical world are understood and applied. The child relates past events to future plans and comprehends how situations change over time. Thinking has become more flexible and abstract. The child has become a reasoning individual who can solve problems by understanding variables and weighing pertinent factors before making decisions. The child now has a clear understanding of the difference between fantasy and reality, and he or she chooses to move from one to the other.

At younger ages, children could apply only one solution, and they often were stuck when the solution of choice did not work. However, by 8 and 9 years of age, children recognize that different solutions can be tried, and they arrive at answers through abstract reasoning rather than through concrete trial-and-error. At this age, children can also pay attention to more than one physical characteristic at a time and can systematically put elements together.

In play, children order objects by size or shape, demonstrating the ability to discriminate perceptual aspects of objects and to order them accurately. They also understand the relationship of the whole to the parts, and they imagine pieces as parts of a whole. With this understanding, they become more competent in organizing tasks and organizing time. Children 9 to 10 years of age can give instructions to others and tell stories in detail.

By middle childhood, children learn to combine tasks and routines into complex games and competitive sports. Because numerous rules are needed to play sports, such as baseball or hockey, the child understands the need to combine the rules into a complete game. To participate in the activity successfully, the child also understands when rules apply and when rules can be negotiated. Most children also know rules can be implemented with flexibility and can be negotiated with adults.¹⁰⁹ The child's progression from games with some structure and flexible rules to highly competitive games demonstrates progression in moral development.

Social

Children 6 to 10 years old form close friendships and "belong" to one or more peer groups that greatly influence their

FIGURE 3-20 Brothers and cousins enjoy outdoor activities at their family farm, including tractor rides.

decisions, how they spend their time, and what they value. Florey and Greene explain, "In the beginning of middle childhood, friendships are characterized by sharing of interests. Toward the end of this period, children tend to organize around common values, commitment, loyalty, and mutual support" (p. 282).⁴⁸

Children in middle childhood focus on meeting challenges in themselves as well as challenges presented by others. Children appreciate the recognition that comes with successful completion of assignments or projects. Comparison with peers is increasingly important during this time. If a child's schoolwork is compared with the work of a more successful student, a negative evaluation can reduce his or her sense of mastery and may produce feelings of inferiority.

School-age children seek independence of identity. They are not as egocentric as young children and demonstrate a more objective view of themselves. Children at this age have a definite subculture, or clique, that includes only certain friends (Figure 3-20). At this age, children are quick to criticize others who do not conform to the group esthetic. Rejection by the child's peers may result from a lack of conformity in dress or physical appearance. Children who have difficulty communicating or who do not know how to initiate relationships are less likely to have close friendships. Children who are socially able and positive are more accepted and have more close friendships. At this age, children develop a peer culture and derive self-worth from their group of peers.⁴⁸

During middle childhood, children become disinterested in adults, including their parents. The values of peers become significantly more important than those of adults. Data indicate that children 7 to 10 years old are highly compliant with and easily shift in the direction of their peers.⁴⁸

Contexts

Cultural Contexts

Expectations for children to work vary across cultures. These expectations determine the timing and type of occupations children develop and the balance between work and play. Examples for countries other than the United States and countries of Europe illustrate these differences. In a study of 50

communities, children at 5 to 7 years of age were given responsibility for caring for younger children, for tending animals, and for carrying out household chores.¹¹⁸ Larsen and Verma⁸² reported that in nonindustrial populations, work during middle childhood exceeds 5 hours per day. In the United States, chores are rarely given to children younger than 8 or 9 years old. Many American families do not expect children to take responsibility for chores until the age of 10 or 11. In contrast, Polynesian children develop household skills by 3 or 4 years, at which time they gather wood, sweep, or run errands to the store. In West Africa, children have duties and run errands when they are 3 years old. In Kenya, 8-year-old girls perform most of the housework.¹¹⁶

Mayan children are continuously at their parents' side during work days. At early ages, they participate in work tasks, such as running errands and helping with cleanup. Bazyk et al.¹¹ found that although Mayan children began work activities at a very early age, they embedded play in these chores. Children in Central Africa acquire work experience from toddler age, and by age 12 they can trap animals, kill game, make medicines, and garden.¹¹⁶ In Nigeria, young children are taught to be helpful, responsible, and respectful. Before age 5, Nigerian girls are taught to perform household chores such as washing, sweeping, cooking, and caring for their younger siblings, and by middle childhood, the girls take full responsibility for these work roles. The number of errands a child was required to run and cognitive performance were significantly related, indicating that having children participate in work tasks at an early age may enhance cognitive competence.¹⁰⁵

In the United States, most children and youth have very few opportunities to work with adults. By one estimate, children contribute about 15% of all labor in households.⁶³ Rogoff et al.¹¹⁶ believe that American children are missing valuable opportunities for learning and gaining self-satisfaction. Compared with practices in societies outside the United States, the lack of work opportunities for American children limits their practice of skills important to their future and may delay their entry into adult work roles. Through experiences in school and guided participation in household work, children may develop work skills and learn social rules and cultural values.⁸³ Children who participate in household chores have higher self-esteem, are more responsible, and can cope more easily with frustrations. One of the best predictors of success as an adult is participation in household tasks during childhood.¹²⁰

Physical Contexts

In middle childhood, the child's play environment is now large and complex; more activities take place in the neighborhood and at school. The school's playground supports both social and physical play of small groups (or pairs) of children. Play occurs on ball fields and in community centers, amusement parks, and sports arenas. Organized activities are often sponsored by churches or by groups such as the Young Men's Christian Association (YMCA). By middle childhood, children have the mobility skills to maneuver through all environments (e.g., rough terrain, busy city streets). The society of school-age children dominates neighborhood streets and backyards, with bicycle races and spontaneous street hockey games. These children explore the woods and go on adventures in nearby parks to find areas unexplored by others. Although supervision by

adults is still needed at times, intermittent supervision usually suffices.

Children spend many of their waking hours in school. Schools offer complex environments (e.g., playgrounds, computer rooms, libraries, classrooms, lunchrooms) with many social and learning opportunities.

Summary

The development of occupational performance is influenced by many systems and variables in the individual child and in the environment. The various patterns observed in children provide insight into how and why a child follows a certain developmental trajectory. Sensory, motor, cognitive, and social skills support the child's performance in play occupations. At the same time, a child's activities are highly influenced by his or her cultural, social, and physical contexts. As an essential occupation of childhood, play provides a means of understanding and appreciating children's performance and a means for enhancing functional performance when development is delayed. The ability to play is also an important outcome of occupational therapy, one that reflects the being of childhood.

Summary Points

- Cognitive development reflects the interaction of genetic endowment and experience. Piaget and Vygotsky theorized that children learn through interaction with the environment and are particularly influenced by their social environment.
- Occupational therapists understand that children acquire new skills within their zone of proximal development through adult scaffolding of the just-right challenge to the child's learning.
- In dynamical systems theory, children acquire new skills through the interaction of intrinsic and extrinsic factors that are flexibly assembled to meet goals that are meaningful to the child.
- Children actively explore their environment. Manipulation skills emerge from perceptual exploration of objects and surfaces. Tactile, proprioceptive, and haptic perception develops from active manipulation of objects.
- Attachment, temperament, and emotion regulation contribute to social-emotional development. Children who develop emotion regulation can cope with stressful events by flexibly using multiple strategies.
- Children develop self-determination by attaining a sense of autonomy, competence, and relatedness. When a child can act independently and competently with the support of others, the child develops intrinsic motivation and self-determination.
- Children develop occupations through participation in family activities and cultural practices. Cultural context influences the child's self-identity, motivations, values, and interests and determines the range of activities and occupations in which the child can participate.
- Occupational therapists working with children must be knowledgeable about the child's development of play and its related performance skills.

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