Quadrant II – Transcript and Related Materials

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Notes

MOTOR DEVELOPMENT

THE DYNAMIC SYSTEMS VIEW

Arnold Gesell (1934) revealed how people develop their motor skills. He had discovered that infants and children develop rolling, sitting, standing, and other motor skills in a fixed order and within specific time frames. These observations, said Gesell, show that motor development comes about through the unfolding of a genetic plan, or *maturation.*

Later studies, however, have demonstrated that the sequence of developmental milestones is not fixed and not due as much to heredity as Gesell argued.

In the last two decades, the study of motor development experienced a renaissance as psychologists developed new insights about *how* motor skills develop. One increasingly influential theory is dynamic systems theory, proposed by Esther Thelen.

According to **dynamic systems theory,** infants assemble motor skills for perceiving and acting. To develop motor skills, infants must perceive something in the environment that motivates them to act and then use their perceptions to fine-tune their movements.

When infants are motivated to do something, they might create a new motor behavior. The new behavior is the result of many converging factors: the development of the nervous system, the body's physical properties and its possibilities for movement, the goal the child is motivated to reach, and the environmental support for the skill. For example, babies learn to walk only when maturation of the nervous system allows them to control certain leg muscles, when their legs have grown enough to support their weight, and when they want to move.

Thus, according to dynamic systems theory, motor development is not a passive process in which genes dictate the unfolding of a sequence of skills over time. Rather, the infant actively puts together a skill to achieve a goal within the constraints set by the infant's body and environment. The story of motor development begins with reflexes.

REFLEXES

The newborn is not completely helpless. Among other things, it has some basic reflexes. **Reflexes** are built-in reactions to stimuli; they govern the newborn's movements, which are automatic and beyond the newborn's control. Reflexes are genetically carried survival mechanisms. They allow infants to respond adaptively to their environment before they have had an opportunity to learn.

The **sucking reflex** occurs when newborns automatically suck an object placed in their mouth. This reflex enables newborns to get nourishment before they have associated a nipple with food; sucking also serves as a self-soothing or self-regulating mechanism.

The **rooting reflex** occurs when the infant's cheek is stroked or the side of the mouth is touched. In response, the infant turns its head toward the side that was touched in an effort to find something to suck. Disappears at about 9 months of age

The **Moro reflex,** occurs in response to a sudden, intense noise or movement. When startled, the newborn arches its back, throws back its head, and flings out its arms and legs. Then the newborn rapidly closes its arms and legs. The Moro reflex is believed to be a way of grabbing for support while falling. 3 months of age disappears

The movements of some reflexes eventually become incorporated into more complex, voluntary actions. One important example is the **grasping reflex,** which occurs when something touches the infant's palms. The infant responds by grasping tightly. By the end of the third month, the grasping reflex diminishes, and the infant shows a more voluntary grasp.

Babinski

Stimulation: Sole of foot stroked

Infants response: Toes fan out and curl. Disappears about 4 months

Stepping

Stimulation: Infant held above surface and feet lowered to touch surfaces

Infants response: Moves feet as if to walk. 4 months of age disappears

Tonic Neck

Stimulation: Infant placed on back

Infants response: Forms fists with both hands and usually turns head to the right (Fencer's pose) 5 months of age disappears.

Some reflexes—coughing, sneezing, blinking, shivering, and yawning, for example— persist throughout life. They are as important for the adult as they are for the infant. Other reflexes, though, disappear several months following birth, as the infant's brain matures, and voluntary control over many behaviors develops. The rooting and Moro reflexes, for example, tend to disappear when the infant is 3 to 4 months old.

Although reflexes are automatic and inborn, differences in reflexive behavior are soon apparent. For example, the sucking capabilities of newborns vary considerably. Some newborns are efficient at forcefully sucking and obtaining milk; others are not as adept and get tired before they are full.

GROSS MOTOR SKILLS

Gross motor skills involve large-muscle activities, such as crawling, moving one's arms sitting and walking. As a foundation, gross motor skills require postural control. For example, to track moving objects, you must be able to control your head in order to stabilize your gaze; before you can walk, you must be able to balance on one leg.

Posture is more than just holding still and straight. Posture is a dynamic process that is linked with sensory information in the skin, joints, and muscles, which tell us where we are in space; in vestibular organs in the inner ear that regulate balance and equilibrium; and in vision and hearing.

Newborn infants cannot voluntarily control their posture. Within a few weeks, though, they can hold their heads erect, and soon they can lift their heads while prone. By 2 months of age, babies can sit while supported on a lap or an infant seat, but they cannot sit independently until they are 6 or 7 months of age.

Standing also develops gradually during the first year of life. By about 8 to 9 months of age, infants usually learn to pull themselves up and hold on to a chair, and they often can stand alone by about 10 to 12 months of age.

Learning to Walk Locomotion and postural control are closely linked, especially in walking upright. To walk upright, the baby must be able to balance on one leg as the other is swung forward and to shift the weight from one leg to the other.

Even young infants can make the alternating leg movements that are needed for walking. The neural pathways that control leg alternation are in place from a very early age, even at birth or before. Researchers have found that alternating leg movements occur during the fetal period and at birth.

When infants learn to walk, they typically take small steps because of their limited balance control and strength. However, one study revealed that infants occasionally take a few large steps that even exceed their leg length, and these large steps indicate increased balance and strength.

The First Year: The timing of milestones, and experiences can modify the onset of these accomplishments. Some infants do not follow the standard sequence of motor accomplishments. For example, many American infants never crawl on their belly or on their hands and knees. They may discover an idiosyncratic form of locomotion before walking, such as rolling, or they might never locomote until they get upright. In the African Mali tribe, most infants do not crawl.

Development in the Second Year: The motor accomplishments of the first year bring increasing independence, allowing infants to explore their environment more extensively and to initiate interaction with others more readily. In the second year of life, toddlers become more motorically skilled and mobile. Motor activity during the second year is vital to the child's competent development, and few restrictions, except for safety, should be placed on their adventures.

By 13 to 18 months, toddlers can pull a toy attached to a string and use their hands and legs to climb up a number of steps. By 18 to 24 months, toddlers can walk quickly or run stiffly for a short distance, balance on their feet in a squatting position while playing with objects on the floor, walk backward without losing their balance, stand and kick a ball without falling, stand and throw a ball, and jump in place.

Fine Motor Skills

Fine motor skills are motor skills that involve more finely tuned movements, such as finger dexterity.

Grasping a toy, using a spoon, buttoning a shirt, or doing anything that requires finger dexterity demonstrates fine motor skills.

Infants have hardly any control over fine motor skills at birth, but they do have many components of what will become finely coordinated arm, hand, and finger movements.

The onset of reaching and grasping marks a significant achievement in infants' ability to interact with their surroundings. During the first two years of life, infants refine how they reach and grasp. Initially, infants reach by moving their shoulders and elbows crudely, swinging toward an object. Later, when infants reach for an object they move their wrists, rotate their hands, and coordinate their thumb and forefinger. Infants do not have to see their own hands in order to reach for an object. Cues from muscles, tendons, and joints, not sight of the limb, guide reaching by 4-month-old infants.

Infants refine their ability to grasp objects by developing two types of grasps. Initially, infants grip with the whole hand, which is called the *palmer grasp.* Later, toward the end of the first year, infants also grasp small objects with their thumb and forefinger, which is called the *pincer grip.* Their grasping system is very flexible. They vary their grip on an object depending on its size, shape, and texture, as well as the size of their own hands relative to the object's size. Infants grip small objects with their thumb and forefinger (and sometimes their middle finger too), whereas they grip large objects with all of the fingers of one hand or both hands.

Perceptual-motor coupling is necessary for the infant to coordinate grasping. Which perceptual system the infant is most likely to use to coordinate grasping varies with age. Four-month-old infants rely greatly on touch to determine how they will grip an object; 8-month-olds are more likely to use vision as a guide. This developmental change is efficient because vision lets infants preshape their hands as they reach for an object.

Around 18 to 24 months of age, toddlers begin to build towers with blocks. Initially, they can only balance two- to three-block towers, but soon the tower increases to four, five, and even more blocks. To build a tower, toddlers must engage in the cognitive activity of planning, in this case a plan that involves a number of sequential movements in picking up and stacking blocks in a precise way. Also, they need to have developed the motor skill to release blocks smoothly so the tower won't topple. In a recent study, substantial individual differences in the tower building of 18- to 21-month-olds occurred. In this study, toddlers

who built higher towers at this age continued to be more advanced in tower building at 3 years of age.

References

Santrock, J.W, 2014. *Child Development*. 14th ed. New York: McGraw-Hill.