INFANCY AND EARLY CHILDHOOD DEVELOPMENT:

A MULTISENSORY EXPERIENCE

SENSATION AND PRE-LITERACY

TOUCH

- Strongest sense at birth

- Embryo responds to touch at 3 weeks.

- 5 ½ weeks gestation- lips/nose sensation } withdrawal

- 12 weeks- entire body sensation } reflexes

- By 3rd trimester, touch is associated with all other senses through thalamic sensory pathways, i.e., rooting reflex - turns head and opens mouth in direction of touch to cheek.

- Sensations prepare for birth process

- Face and mouth are most sensitive, even at 5 years of age.

- Babies love massage.

- Bouncing activates all senses (movements through vibration).

LET KIDS PLAY/USE TOUCH WHILE READING WITH THEM (Lap Time).

SMELL

- Helps select food and avoid toxins

- Mother finds baby's smell very appealing and vice versa.

- Smell aids development though other sensory pathways.

- Smell-odor triggers electrical chemical excitation through networks to limbic/mood system. Smell and mood are strongly linked (i.e., odor memory).

- Thousands of chemical detectors are in the nose versus taste/tongue that has only 4 chemical categories (sweet, salty, bitter, sour).

USE PLEASANT ODORS IN THE ROOM WHILE READING – PLAYING.

TASTE

- Amniotic fluid is rich in chemicals to excite taste.
- Taste is a survival mechanism and prepares the fetus for the sweet taste of mother's breast milk and nurturing.
- Taste buds mature toward the end of the 1st trimester (the same time that the fetus begins to suck/swallow).
- Four chemicals categories: sweet (strongest), salty, bitter, sour
- Flavor is the interaction of taste and smell.
- Taste in the womb may influence later taste.
- Sweets induce pleasure and energy (endogenous opiates in the brain).
- Yes, nutrition is very important yet the universal joy of sweets tell us of a positive relationship with learning.

A "SWEET TREAT" CAN BE GOOD WHEN READING/LEARNING

VISUAL

- Light is converted into electrical signals for color and intensity of visual stimuli.
- Light strikes rods and cones of eye (photoreceptors).
- At 24 weeks gestation the fetus reacts to light on the mother's abdomen.
- Infant's vision is approximately 8 inches in front of them at birth.
- Very many connections in visual brain within a few months: the eye moves with movement stimuli more than color at birth.
- Eye movements show control at even 6 months.
- 1960's Nobel Prize for Huber and Wiesel: they sewed eyes of kittens shut shortly after birth. The deprivation significantly affected growth in the visual cortex. More importantly, if one eye lid was closed shut the impact was worse. When both eyes were closed the electrical activity was reduced yet it was symmetrical. When one eye lid was closed the minimal electrical activity was overwhelmed by the other eye and lost space in the visual cortex.

EFFICIENT EYE MOVEMENT IS NECESSARY FOR THE DEVELOPMENT OF READING AND WRITING. EYES MUST GUIDE READING AND WRITING VERSUS HEAD MOVMEMENT GUIDING READING AND WRITING.

<u>HEARING</u>

- Hearing is wired inutero.
- Movement → Vibration → Sound
- Vibration changes pressure in a surrounding medium (i.e., air, bone, water).
- Sound waves have frequencies (pitch) and amplitude (loudness).
- Humans hear 20 – 20,000 hertz (vibrations per second). The lower the number, the deeper the tone.
- Normal conversations (60 decibels) versus jet plane (140 decibels)
- Vibrations from sound (or implant) charge sodium/potassium ions and affect electrical signals that excite/inhibit auditory information in the brain.
- 4 weeks inutero, auditory pathways develop.
- At 6 months gestation various sounds can be differentiated.
- Fetus responds to sound stimuli on the mother's abdomen (ultrasounds show movement with sound). The fetus blinks in response to large sounds.
- Hearing is closely connected with mood and all senses.

READ-READ-READ TO INFANTS AND YOUNG CHILDREN (with much expression).

ALL SENSES STIMULATE GROWTH, INTELLIGENCE, AND LEARNING.
ALL SENSES ACTIVATE ATTENTION – MOTOR- MEMORY – SPEECH/ LANGUAGE (VERBAL AND NON-VERBAL) – EXECUTIVE AND MOOD FUCNTIONS.
ALL SENSORY EXPERIENCES IMPACT SOCIAL DEVELOPMENT.