

What Goes On in that Little Head

Phyllis Porter, M.A.
Educarer, Inc.

Educarer, Inc. 2013

Educarer, Inc. www.educarer.org

- Our philosophy is based on Magda Gerber and Maria Montessori and emphasizes respect for the child.

Courses and Articles on this website:

- SIDS / SBS "In-Service" courses & certificates
- Overindulgence Infant Social Relationships
- Cultural Dynamics Fetal Alcohol Syndrome
- Multilingual: (French, Spanish, German, Italian, Portuguese, Japanese, Korean, and Chinese)

Educarer, Inc. is a 501(c)(3) non-profit organization

Objectives

- To be able to identify important parts of the brain.
- To understand the roles of both cortisol and touch in brain development.
- To understand the caregiver's role in brain development.
- To be able to discuss fear and its implication on brain development.

Educarer, Inc.

Quiz (T/F)

- T Basic brain connections are laid down before birth.
- T Babies are born with the ability to learn all the languages in the world. *→ will loose sounds if not used*
- T A human baby's brain has the greatest density of brain cells connectors (synapses) by age 3.

Educarer, Inc.

Quiz

- F Because the brain is making so many connections pre-birth to age 3, the first three years of life are the most critical for brain development. After age 3, the "window of opportunity" closes.
- T Good nutrition is one of the best ways we know to aid healthy brain development.

Educarer, Inc.

Quiz

- F Reading to a newborn infant is the best way to help a child learn to read in the future. *→ talking/building language is best prior to reading*
- F/T Living in an orphanage as a baby will likely result in negative, long-lasting effects on the brain.
- T There are times when a negative experience or the absence of appropriate stimulation is more likely to have serious and sustained effects on the child. *→ drug/alc. abuse ex.*

Educarer, Inc.

Quiz

- T The large majority of what we've learned about the brain comes from research conducted on animals rather than on humans.
- T Brain research has been misunderstood and misapplied in many contexts.

Educator, Inc.

7

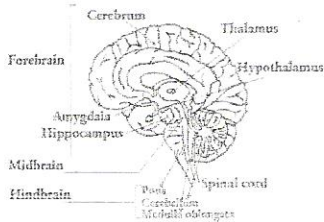
Misunderstandings

- Mozart Effect → claim that listening to Mozart will ↑ intelligence. *Best results*
- Balanced Beginnings → *flour kit for building "best" baby brain (was kids biggest)*
- Baby Einstein, etc.
- Free is best!

Educator, Inc.

8

Brain



Educator, Inc.

9

Fear and Anxieties

- Amygdala → hypothalamus → pituitary and adrenal glands = adrenaline, norepinephrine and cortisol
- Prolonged stress = physiological consequences.

Fear is processed through amygdala → adrenaline etc. released to the body

Educator, Inc.

10

** If child's needs are not met (coming from a stressful home environment), they are focused on taking care of need & very challenging to learn when they're so focused on their need.*

Anxieties & Fear

- Anxious children get stomachaches and physical malaise
- Too much fear leads to phobias, posttraumatic stress disorder.
- The amygdala hijacks the brain!

↳ especially for children because they don't have the knowledge/understanding

for now to move on.

Environmental Implications

- What can we do as parents and caregivers?

** sleep allows learning to take place because that is when truly process
* comfort/create a safe place when children are anxious*

*↑ cortisol can cause low immune strength which means they are very susceptible to getting sick
↓
high cortisol common at major milestones ex: 1 yr learning to walk sick all the time*

Rest & Nutrition

- Enough restful sleep - how much is enough?

12-14 hrs for infant/day

- Protein, fatty 3 acids - myelin sheath

- Leafy green vegetables (how?)

↓
garden - what they make they like. 😊

↓
can't see how it's building but when they feed themselves are able to rotate wrist - shows 13

the myelin sheath is complete as it came through whole arm!

toddler 10-12 hrs
preschool 8-10 hrs

Water

- Water washes the brain!

- Thirsty brains cannot think.

* If a child is acting out, take a minute to support them & give them water to support brain/calm down. → breast milk for infants (same concept)

Multi-sensory Toys

- More senses involved - more learning

Sensory bottles & tables

- The more senses involved in the learning situation, the more likely the child is to process the information.

Novelty

- Novelty causes the brain to be more alert.

ex: don't move everything in childcare (too much at once) but switch up some & it is interesting/noticed

Aromas

- Peppermint, orange, cinnamon - more alert

- Chamomile, lavender, rose - calm us

- Play-doh, paints, potpourri
- ↳ can trigger seizures so ask parents for

* sense of smell memory is the one we remember longest

Music

- Harmonies - rewire brain
- Certain areas of cortex is 5% bigger in musicians' brains.
- Corpus callosum is 15% larger in musicians.
- Professional musicians' auditory cortex has 130% more grey matter.

→ playing & making music supports this

Repetition

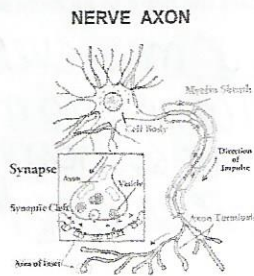
- Repetitions strengthen the brain connections.
- Use it or lose it.

Patterns

- The ability to see patterns and build relationships on those patterns leads to increased intelligence.

ex: seasons → routines
→ days of week

Synapses



Synapses

- Dendrites & axons meet at a synapse which is where actual information exchange occurs. *learning takes place*
- 1,000 trillion occur by age three.
- The communication consists of chemical and electrical signals.
- The neurotransmitter chemical is serotonin, dopamine or endorphins. → *all of which are produced when one is happy * ↑ happiness, ↑ synapses*

= great learning

How synapses occur

- Degradation / *disappear*
- Diffuse / *spread*
- Re-uptake
- Synapse occurs

** often the more we talk to kids the less they are touched → be conscious to this*

Causes of synapses

- Touch → *everytime touch infant more synapses occur*
- Each new experience → *all is new for newborn*
- Use it or lose it
- Experience is important in wiring the brain

Maturational Processes

- Synaptogenesis
- Myelination
- Cell death/pruning
- Postnatal neurogenesis

→ you can develop new neurons post birth

The Dendrite Song

Use your dendrites
Use your dendrites
To connect throughout your brain
Take in info, analyze it,
Grow some new ones
Unrestrained.

Dendrite Song

Axons send out
Neurotransmitters
To the dendrites all around
Across the synapse
Jumps the impulse
New ideas can now abound.

Dendrite Song

Stimulation
Is what the brain needs
To make dendrites stretch and grow
New connections
Make us smarter
In what we think and what we know.

Dendrite Song

Use your dendrites,
Use your dendrites,
To connect throughout your brain
Take in info, analyze it,
Grow some new ones
Unrestrained.

Fun Facts

- At birth:
 - > 100 billion neurons – as many as the stars in the Milky Way – brain cells (cell body, axon and many dendrites)
 - Neurons send info through a single axon.
 - > One trillion glia, the “glue” form a honeycomb that protects the feeds the neurons.
 - Pattern of wiring needs to stabilize. → *after birth*

Fun Facts

- Post Birth: Neural activity is driven by a flood of sensory experiences.

- 0-3: Trillions more connections between neurons
 - 2-10: Excess synapses pruned *2-22 yrs actually* / *lost if not used*
- Bad experiences can stop growth.

Ten Things the Brain Needs

Interaction

- Quality
 - Good prenatal care
 - Warm & loving attachments
 - Positive stimulation
 - Interplay between nature and nurture
 - Positive physical touch
 - Language development
 - Early experiences

Touch

- Each touch builds synapses in infants' brain.

Stable Relationship

- Dr. Spitz study in the '40s
- Romanian orphanages – video
- Necessary for survival

Self Esteem

- Root of feelings is in brain stem.
- Takes one and a half years for child to learn to control feelings
- Parents play crucial role. *→ they are the necessary ones for a child to develop (+) self esteem*

Safe & Healthy Environment

- Lead-free
- High fat diet increases lead absorption

Educarer, Inc

37

Quality Care *1:3 ratio ideal*

- Small group sizes and low child-adult ratios
- Consistent primary caregivers - attachments
- Low staff turnover
- Active parent participation → *invite to read/play pot luck/picnic*
- Staff trained in child development *art/project snow*
- 10 hour rule
- Benefits and living wages for caregivers *parents welcome*

Educarer, Inc

38

Communication

- Conversation is critical!
- Exposure to many words pays off in school.
- Get needs met.

Educarer, Inc

39

Play

- Play is essential to a child's development.
- Play is linked to mental development.
- Adults playing with children gives the best results.

Educarer, Inc

40

Music

- Babies need to be involved with music.
- *talk about history/style/differentiating factors*
- Parents and children together.

- Many benefits!

→ *all types of music for exposure but don't have it on 100% of time*

Educarer, Inc

41

(becomes background music)

Reading

- Brings parents' relationship with child to the active reading experience
 - Sharing a book leads to learning to read.
 - More you do it, more brain connections!
 - Read over & over (repetitions)
 - Two parts of reading:
 - Decoding → *what symbols mean (letters, etc.)*
 - Uses → *why we read*
- ex: directions, have to read to know how to do*

Educarer, Inc

42