

# DEFINABLE FORMED PATTERNS

Glen T. Steele, O.D. FCOVD FAAO  
Professor of Pediatric Optometry  
Southern College of Optometry  
Memphis, TN

# INTRODUCTION

- From the beginning, we assess “looking ability.”
- As the newborn begins to “look” in their new world, the function and control is random and sporadic.
- Through the course of development, function and control become more accurate and sophisticated.
- These observations can be made during the course of an examination

# INTRODUCTION

- Depending upon what they “practice,” the developing infant acquires abilities.
- If there is little to no purposeful movement and interaction with the environment (passive development), eventual levels of function and performance will potentially be limited.
- This includes issues from academic performance, sports, work ethic, language development, social interaction, and contributes (contributor, not cause) to such diagnoses as developmental delay and even autism.

# INTRODUCTION

- Why? One reason is that during development, they never learned or were never curious enough to “LOOK.”
- Learning to look is paramount to the overall process of development. But – developing looking ability while maintaining awareness of surrounds is also important.
- Looking and seeing are different processes

# INTRODUCTION

- Why? Because one can “look” and not be aware of where to look or what to do when they acquit.
- What is the foundation of learning to look?

# INTRODUCTION

- Mark Twain was quoted as saying, “You can’t depend on your eyes when your imagination is out of focus.”
- Imagination forms as a result of internal curiosity, visually looking, reaching, doing, and doing over and over again.
- This form of “looking” becomes a pattern. The patterns become defined and then become a part of the child’s fabric.

# BUBBA'S EIGHT A'S

- Activation
- Awareness
- Attention
- Anticipation
- Action
- Adjustment
- Accomplishment
- Acquittal

# BUBBA'S EIGHT A'S

- This is the visual action
- There are also actions in all other processes and systems
- Richards and Casey – A model of heart rate defined attention phases in infants

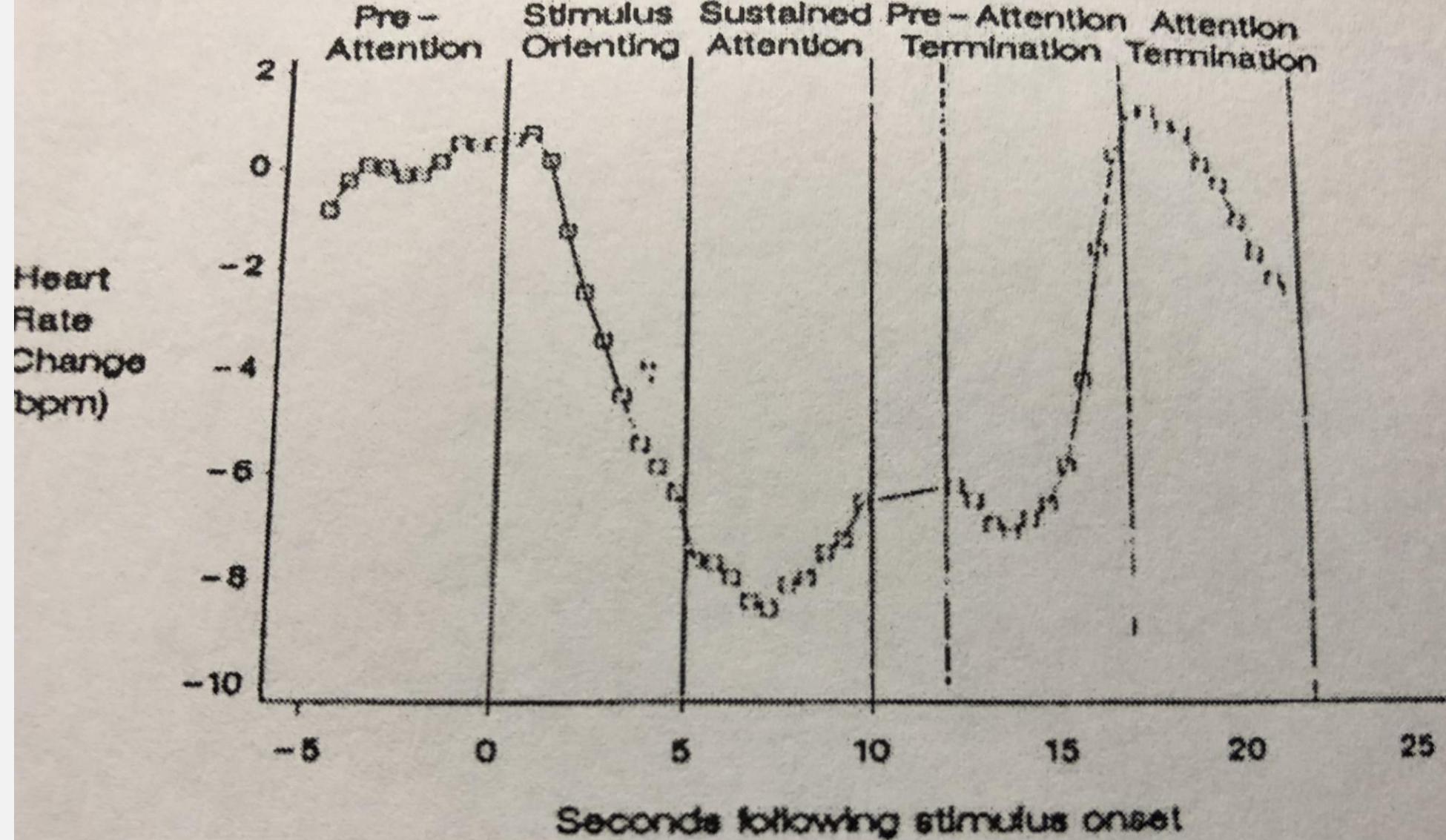


FIG. 2.1. The HR-defined information-processing phases (Copyright © 1990, The Society for Psychophysiological Research. Reprinted with permission of the publisher from Richards & Casey, 1991).

# CONCEPT

- The processes of development are a continuum that begins with conception and ends at death.
- Babies are born with certain hardware.
- Through development, they must shift from reflex control to a pattern of self control.
- It is an artificial process to try to define concrete and separate phases and stages of these processes as entities unto themselves.

# CONCEPT

- At the same time, the sequences of development have a hierarchy and each phase becomes a foundation for the next phase.
- It is within this process that individual definable formed patterns become evident.
- Definable formed patterns that serve the needs of the developing infant in an appropriate manner are expected

# CONCEPT

- It is when the developing patterns are incomplete or inadequate that problems arise in the individual.
- If sufficient numbers of patients also show the same definable formed pattern(s) over a similar time other than typical development, it can lead to a definable formed syndrome.

# CONCEPT

- Gesell briefly mentioned definable formed patterns in the 1940's.
- It related to the emergence of patterned formed responses that were consistent and occurred across several patients.
- Examples of today are developmental delay, refractive issues, CI, AI, etc., that show a specific and consistent response to a specific and consistent stimulus.

# CONCEPT

- We know this only through practice.
- If it happens only once, it would/could be coincidental.
- In developmental biology, pattern formation refers to the generation of complex organizations of cell fates in space and time.
- As we see more and more cases showing the same patterns and as we practice more and more, we better understand the definable formed pattern as described by Gesell.

# DEFINABLE FORMED PATTERNS

- **Definable formed patterns** begin to appear very early during the developmental process and are the result, not the cause or director of such patterns. At this stage, we might call them definable **forming** patterns.
- Too often, we think of these definable forming patterns as occurring from birth. Not so!
- Repetitive movements in the womb lead to defined patterns that are manifest at birth. These are often less controlled with guidance than those that are formed after birth.

# DEFINABLE FORMED PATTERNS

- Definable formed patterns (DFP) are developed as the result of the manner in which the infant and young child goes about their daily living.
- At any point in time, the definable forming patterns can be altered whether by internal change or external guidance.
- However the longer one has “practiced” the DFP, the more difficult it is to restore to the appropriate track of development.

# DEFINABLE FORMED PATTERNS

- As an example, partner discussion often centers around the term “selective hearing.”
- Using that concept, the term “selective seeing” or more accurately, “selective looking” can be in play during all waking hours, occurring not only in the developing infant and young child but in the adult as well.
- The definable formed patterns become one of focus while ignoring other information to which the individual might attend.

# DEFINABLE FORMED PATTERNS

- At some point, this might be called a “**habit.**” Some are “good” habits and some need to be “broken.”
- We must understand that this did not become an issue at this later stage but had been building as a definable formed pattern for some time prior to recognition as a “habit.”
- Another view of “visual habit” would be a **diagnosis.** These patterns go from an infrequent occurrence to a defined formed pattern to a habit or diagnosis

# DEFINABLE FORMED PATTERNS

- At any stage, the move can be made from a definable forming pattern to a defined formed pattern to a habit/diagnosis if “practiced.”
- Moving into this pattern, determining action, and releasing to the next task is appropriate but even that is a definable formed pattern.
- For instance, it is important for patients to go into a myopic response when necessary but the key is retaining the ability to release – a definable formed pattern that is a positive response to a situation.

# GENETIC MAKE-UP

- While genetic makeup is a part of pattern formation, defined formed patterns are less influenced by [genes](#) in the developing infant. Genetic makeup is only the starting point.
- Following birth, the manner in which the developing infant engages within the environment becomes much more a part of development. As the infant begins to form patterns through synapse development, they become unique within the individual pattern of development.

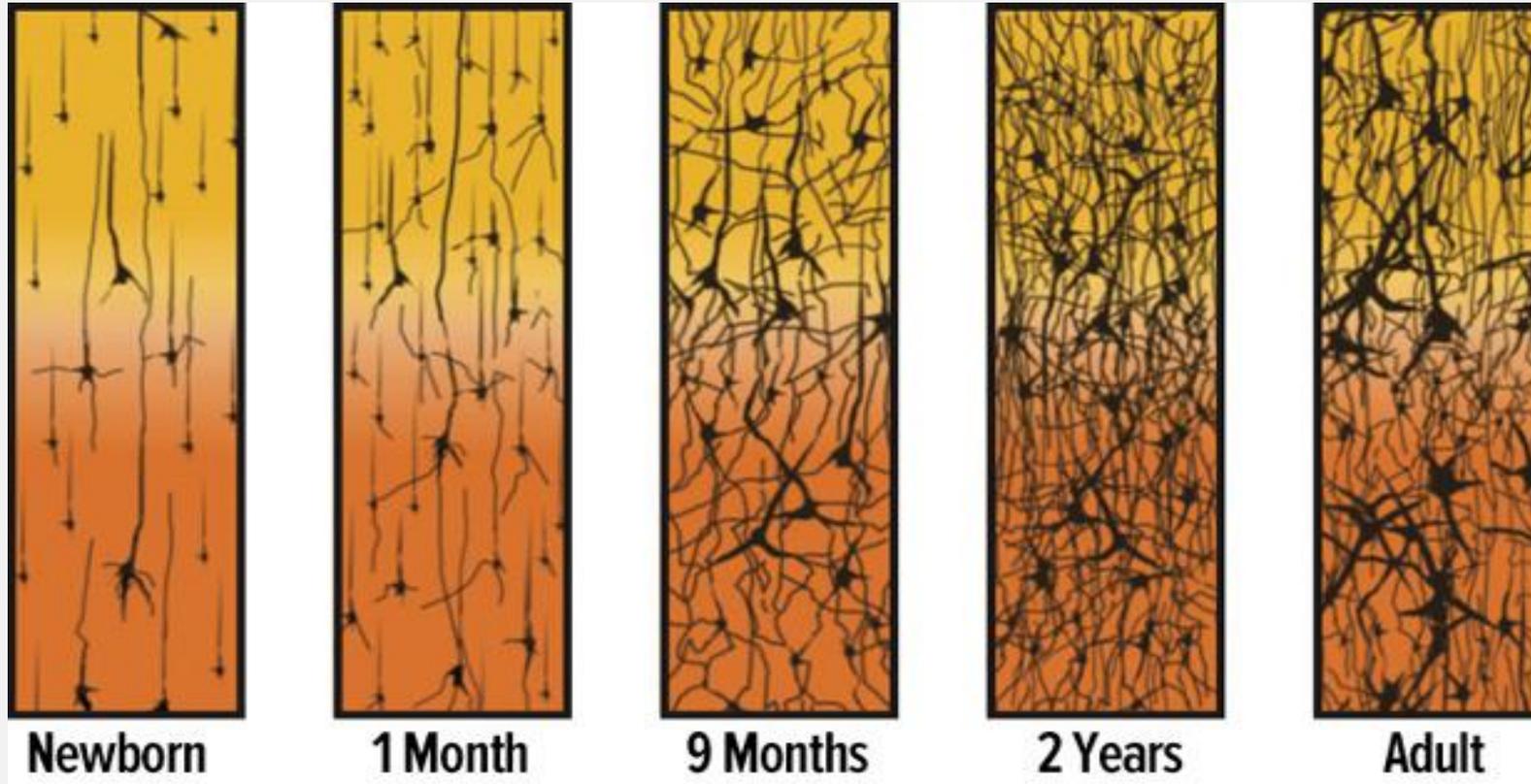
# MODEL OF DEVELOPMENT

- Babies born with fragmented and inaccurate movements
- As they begin to look, the movements become more accurate
- As they become more accurate, their internal curiosity moves them to look for things beyond their immediate reach
- Their internal curiosity leads them to be more accurate and more sophisticated as they gain control and ability
- Bottom line – VISION leads all of this and therefore is the foundation for overall development

# MODEL OF DEVELOPMENT

- As vision becomes more accurate and sophisticated, so does the activity. If vision is impaired in any manner, the activity is not performed as accurately and the baby will not reach the level of sophistication necessary to appropriately move on in the process of development
- Think deeply into the curiosity-looking-movement-doing process – and Vision becomes the primary leader of overall development

# SYNAPSE DEVELOPMENT



Synapse Density Over Time FIGURE 3

Source: Corel, J.L. The postnatal development of the human cerebral cortex. Cambridge, MA: Harvard University Press; 1975

# SYNAPSE DEVELOPMENT

- In the previous image above, the patterns are seen forming. A few are already shown at birth but more developing the first, ninth and 24<sup>th</sup> months. The patterns then begin to be pruned due to activity and interest and full patterns, habits, or diagnoses are made by adulthood.
- The motor signal for an infant or toddler is not the same as a similar motor signal of an adult – Richard Breneuch, PhD.

# OUTCOME OF SYNAPSE DEVELOPMENT





# SYNAPSE DEVELOPMENT

- Movement requires a brain. **Purposeful** movement requires a more complex brain. Higher learning requires higher motor abilities - I of the Vortex, *Rodolfo Llinas*

# CHILD BORN WITH VISUAL HUNGER

- How we (caregivers) feed that hunger or allow it to be fed is so very important
- Definable formed patterns emerge out of how the hunger is fed. Bad habits are the result of inappropriate definable formed patterns over time
- Intervention while the DFP is developing is less complicated than “breaking” a bad habit

# BUBBA ON DEVELOPMENT

- When young, babies reach with their eyes but the whole body reacts.
- Eventually, they begin to isolate certain functions but vision still leads.
- One must look and reach with eyes as they link their internal curiosity with their physical abilities to the external world.

# BUBBA ON DEVELOPMENT

- Contrary to Getman, babies reach first with their eyes. The following is from the Gesell video - The Embryology of Human Behavior.
- “A baby reaches with eyes long before they reach with their hand or move their body.
- The eyes are pathfinders.”

# A MODEL OF INTERVENTION

- A step in development is not in a straight line – it is a spiral and you keep coming back to things you thought you understood to find deeper truths. For example, after doing a procedure that is a part of your fabric, you suddenly make a consistent observation that you have not made before. Your “looking” for this becomes a definable formed pattern.
- But it must become intentional and purposeful

# A MODEL OF INTERVENTION

- The doing part of intervention – doing is intentional - initially done with thinking. We understand academically before we understand clinically.
- Intentional intervention – if it doesn't become intentional there is no perceived value. Know what you can do.

# A MODEL OF INTERVENTION

- Purposeful intervention – intervention with a purpose and that purpose is to provide intervention at the earliest possible time in the development of definable formed patterns
- Early Intervention - intervention for the purpose of changing the definable formed patterns in early development before it has a chance to become a full blown pattern, habit, or diagnosis

# CONCLUSION

- Earliest development consists primarily of doing – Bubba's Eight A's
- As a child goes about the continuing process of development, their doing becomes more consistent
- Consistent doing evolves into definable formed patterns. It becomes a part of one's fabric

# CONCLUSION

- Definable formed patterns will become automatic – done without thinking
- Definable formed patterns can become habits and even diagnoses
- Definable formed patterns occur as a result of the manner in which we go about our activities of daily living and can be observed during a comprehensive visual examination.

# CONCLUSION

- The examination should not be considered as doing a number of tests but in making clinical observations of the manner in which the patient approaches the task and the observation of the child in developing their **DEFINABLE FORMED PATTERNS**
- Earliest diagnosis and intervention allows the infant/young child to progress in a more typical pattern of development based on their cultural expectations.