AUTISM: THE VISION CONNECTION

Autism One
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WHAT IS VISION?

- Is vision equivalent to sight?
- Is vision both a sensory and motor process?

VISION

- Perceiving
- Processing
- Performing

EXAMPLES OF VISION

- Toddler and vase
- Driving a car

❖ Why is vision is important?

VISION DIRECTS THE TOTAL MOTOR RESPONSE

- Who gives the orders when driving a car: accelerate, de accelerate, turn, stop?
- Who gives the orders when we walk: where to step, how big a step to take and our speed?
- Who gives the orders when we write: size and spacing of letters and words?
- Who gives the orders when we read: are we fixated on a word or two or looking ahead?

VISION: MAIN OPERATING SYSTEM OF THE BRAIN

- Retina is brain tissue
- At least 10 different visual pathways to other brain functions
- In large part, our response to the world is based on what we perceive and process through our vision.

ROLE OF VISION IN ORIENTATION

- Define orientation
- Orientation:
  - Reference point
  - Direction
- Spatial or Visual Relationships:
  - We have to know our body and the space it occupies.
  - We have to know where we are in space.
  - We have to know our body parts and their relationships to one another.
  - We have to know where we are in relationship to objects in our surrounding space, and the relationship of objects in space to one another.
- What we can't see we must visualize.

VISUALIZATION

- Spelling Sports Memory
- Visualization is foundational for the following:
  - Orientation
  - Organization
  - Following directions
  - Directionality
  - Creativity
- Visualization is built on other visual skills.

HOW DO WE LEARN ORIENTATION?

- Vision plays a major role in knowing how much space our bodies occupy, i.e. internal map.
- Vision allow us to develop a picture of our body parts and their relationship, i.e. internal map.
- Vision plays a major role in knowing where we are in space by allowing us to see the total spatial volume.
- Vision allows us to determine what is around us by answering the following questions:

  Where is it? What is it?

MISMATCHES IN SPACE

- Most vision problems are actually mismatches in space. A mismatch is a discrepancy in where you see it and where it is.
- Mismatches cause bumping into objects, spilling milk, knocking over things, food stains on clothes, clumsy writing, skipping lines, inappropriate timing in general, etc.

PURPOSE OF VISION

- Extract meaning and guide action, e.g. reading, writing, driving, catching and throwing a ball, etc.
- Select an area for attention and simultaneously see the total spatial volume or the bigger picture, e.g. reading, writing, orientation, and organization.

VISION ANSWERS 4 QUESTIONS

- Where am I in space (orientation)?
- Where is it?
- What is it?
- What do I do with it (organization)?

ROLE OF VISION IN ORGANIZATION

- Cleaning a room
- Cooking a meal
- Verbal expression
- Written expression

TWO VISION SYSTEMS

- Focal vision system
- Ambient vision system

FOCAL VISION SYSTEM

- Identification
- Content or details
- Anchor point: the selection of an area for attention

AMBIENT VISION SYSTEM

- Governs or has a major impact on posture, balance and movement systems through the midbrain
- It is a spatial orienting system
- Fundamental for creation of a "Personal experienced space world", i.e. a map.
- It answers the question: Where am I (in space)?
- Allows us to select an area for attention and simultaneously see the total spatial volume
- Sets the stage for the Focal Vision System

WHY IS THE PERIPHERY/AMBIENT VISION SYSTEM SO IMPORTANT?

- Humans require light to be evenly distributed across the back of the eye.
- Light is both energy and information:
  Energy necessary to regulate many brain and body functions.
  Information to inform us about the real world.
- All vision problems and adaptations are constrictions or distortions of how we use energy and information provided by light, e.g. myopia and tunneling.
- The way we organize the periphery is the foundation or context for thinking, movement, speaking and listening.

TUNNELING: A Common Visual Adaptation

Defined: We lock into the task visually and ignore all other sensory information

Examples:

- Calling someone several times to get their attention when they are reading, working on a computer or watching TV
- Locked in on the road and *missing* exit sign
- Going off on tangents in conversations
- Answering a question, but not responding to the question being asked

TUNNELING: SUPPRESSION **of CONSCIOUSNESS**

Webster's Dictionary:

- Avoidance of thoughts or feelings
- Cessation of function

TUNNELING: Suppression of consciousness

- Collapsed space world
- Subconscious adaptation
- Monocular and binocular phenomena
- Constricted fields are often asymmetric.
- Reduced amount of information perceived
- What is meaningful can be limited to what is directly in front of our faces
- It is as if we are seeing the world through a telescope or binoculars.
- We can have figure without ground or a much constricted ground.
- Often unaware of body.**
- Common strategy among all visual adaptations

TUNNELING: SIGNS & OBSERVATIONS

- Unaware of surroundings, e.g. misses exit signs, social cues
- Difficulty making transitions
- Reduced or lack of body awareness
- Have to be called several times before responding when watching TV, reading or working on a computer
- Difficulty following multiple directions
- Difficulty reading social cues in a group

TUNNELING DEMONSTRATION

Walking: 2 ways about 10 steps

1. Look at the ground 2-3 feet in front of you.
2. Look as far away as you can, centering on something in the distance.

CHANGES TO OBSERVE

- Size of steps
- Posture
- Body tension
- Breathing
- Awareness of space

THOREAU

"The question is not what you look at, but what you see. You can't say more than you see".

SEEING IN A FRAGMENTED FASHION

- Soccer & basketball
- Classroom: copying, listening, reading, writing

CHARACTERISTICS OF PATIENTS SEEING THE WORLD IN A FRAGMENTED FASHION

- Say "what" or have delayed responses
- Head moves when reading
- When reading the Snellen chart, head moves up and down as eyes move from one letter to the next
- Speaks/reads slowly or with frequent pauses

Continued…

- May read fast (holding breath) to compensate for slowness of seeing the world in small chunks
- Draws shapes/letters in a segmented manner
- Unequal spacing between letters and words

EYE MOVEMENT & LOCATION SKILLS

- Define
- Provide rapport with environment
- Primary for competent and effortless vision functioning, e.g. sports, driving, reading, and writing
- Problems lead to disorganization, disorientation, and distractibility

❖ Tunneling or collapsed visual fields typically is the cause of inadequate eye movement and location skills.

ROLE OF VISION IN THINKING PATTERNS

- Can the we select an area for attention and simultaneously see the big picture?
- Do we have a general idea of the big picture, but have trouble seeing the intra relationships?
- Do we get lost in the details?

VISION is the BRIDGE

- From the concrete to the abstract world:
  We have to see the details/content provided by the focal vision system in context, provided by the ambient vision system .
- When we don't see things in context:
  We jump to the wrong conclusions, go off on tangents and exhibit disorganization, distractibility, disorientation, recklessness, and impulsiveness.

FIGURE/GROUND

- We are really dealing with peripheral and central relationships
- Seeing things in perspective
- The Focal Vision System is the anchor point for the selection of content
- The Ambient Vision System is the big picture or context

AMBIENT VISION SYSTEM COMPROMISED

- Cognition, speech-auditory, balance, movement, posture , emotions and feelings all become impaired, e.g. takes longer to grasp things, miss out on the big picture, read haltingly, experience facial and body tension, we lock our knees and squeeze our toes.
- In addition, we often become fatigued, anxious or irritable.

VISION PROBLEMS ARE SYNDROMES

Vision syndromes affect the following:

- Cognition
- Posture
- Balance
- Movement
- Speech/auditory
- Emotions and feelings

VISUAL SYNDROMES

- Vision Development Syndrome
- Learning or Reading Related Vision Syndrome
- Stress Induced Vision Syndrome
- Strabismus Syndrome
- ABI Syndrome
- **Autistic Spectrum Syndrome**

ROLE OF VISION IN COGNITION

- Disorientation, Disorganization & Distractibility
- Fragmenting space
- Tunneling
- Difficulty following multiple directions
- Reading comprehension problems

❖ Cognitive Intelligence: nature/nurture/interaction

ROLE OF VISION IN POSTURE

- Body & Facial Tension
- Static Posture
- Dynamic posture

ROLE OF VISION IN MOVEMENT

- Hyperope
- Myope
- Esophore
- Exophore

ROLE OF VISION IN SPEAKING

- Inarticulate: communication is compromised by inability to define, describe what we are seeing
- Disorganized
- Go off on tangents
- Voice too loud or too low

ROLE OF VISION IN LISTENING

- Space out when listening
- Frequently requires information to be repeated
- Difficulty listening and taking notes in class
- Difficulty maintaining eye contact and listening

ROLE OF VISION IN EMOTIONS & FEELINGS

- Overwhelmed /Sensory Overload
- Difficulty with transitions
- Anxiety

AUTISTIC SPECTRUM VISION SYNDROME

- Inadequate eye movements & Location skills: poor eye contact, poor control of where looking unless highly engaged in activity
- Tunnel: difficulty making transitions, unaware of surroundings, misses out on social cues, when dealing with a lot of information-disorganization, disorientation, distractibility, failure to see bigger picture or consequences, difficulty following multiple directions

AUTISTIC SPECTRUM VISION SYNDROME…

- Collapsed space world (a lot of information in a smaller space): miss out on details, inaccurate spatial judgments, poor eye contact, unaware of body, ungrounded-require self stimulating acts to ground, or monitor self by seeing self in mirror

SEEING THROUGH NEW EYES by Mel Kaplan

"When these (visual) processes break down, the results can be catastrophic-because seeing a world that's distorted, fragmented, two dimensional, or incomprehensible can be as disabling as not seeing anything at all."

LENS APPROACHES

- Conventional Care-compensating lenses
- Behavioral Care-performance lenses

PRESCRIBING LENSES

1. Compensating Lenses or 20/20 Lenses
   - Prescribed for the following primary rationale:

Improve visual acuity

Compensate for hyperopia

Compensate for presbyopia

2. Performance Lenses
   - Prescribed to change the following: movement, thinking, speaking, listening
   - Low power or reduced power glasses

COMPENSATING LENSES

- Demonstration
- Produce facial and body tension (shoulder, neck and upper back)
- Cause the body to feel short and heavy
- Walking: stride is smaller and steps are typically heavier

PERFORMANCE LENSES

- Enhance overall performance
- Evenly distribute body weight
- Reduce or eliminate body tension
- Posture more in alignment and erect

Continued…

- Time and space relationships are much more valid than prescribing full the power, e.g. read more fluently, speak clearer, breathing is deeper
- Reduce or eliminate mismatches in space
- Train to next level of performance
- Produce calmness

ROLE OF VISION IN BEHAVIOR

- Humanity is built to respond to internal and external feedback.
- Feedback is fundamental to learning.
- Vision plays a major role in sensitizing us to feedback and processing feedback.*

TREATMENT

- Performance lenses
- Visual Training
- Syntonics

❖ When vision is working well, all other therapies are enhanced because that child or adult is more available.

The last thing I would like to leave you with is a quote from the Talmud, a history of Jewish traditions:

"We do not see things as they are.
We see things as we are."