

CONSIDERATIONS FOR PRAXIS ASSESSMENT FOR INDIVIDUALS WITH TRAUMA BACKGROUNDS

Teresa A. May-Benson, ScD, OTR/L, FAOTA

CONTACT INFORMATION

- Teresa A. May-Benson, ScD, OTR/L, FAOTA
- tmb@tmbeducation.com
- Facebook: TMB Education
- Instagram: [tmbeducation](https://www.instagram.com/tmbeducation)

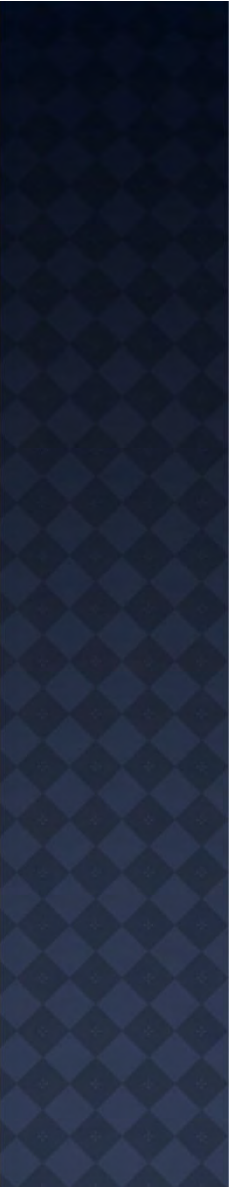
GRATITUDE

- ⦿ Jane Koomar, PhD, OTR/L, FAOTA, friend, mentor and colleague whose work in trauma and sensory integration I endeavor to continue.

- ⦿ To the children and adults and their families we have learned so much from and for allowing us to share their stories.

INTRODUCTION TO TRAUMA AND PRAXIS

© T May-Benson, 2021



WHY OT AND TRAUMA/ATTACHMENT

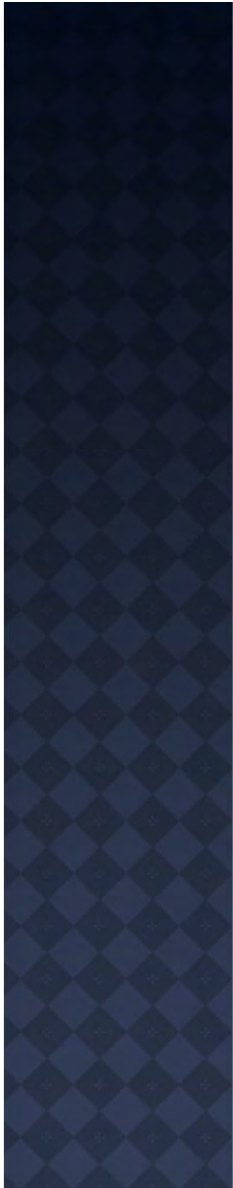
- ⦿ Occupational therapists with sensory integration training are treating increasing numbers of children who also have trauma and attachment disorders.
- ⦿ These children and adults with trauma often have sensory sensitivities secondary to trauma and can benefit from knowing how sensory strategies can help with:
 - regulation
 - body awareness
 - motor skills
 - planning and organization.



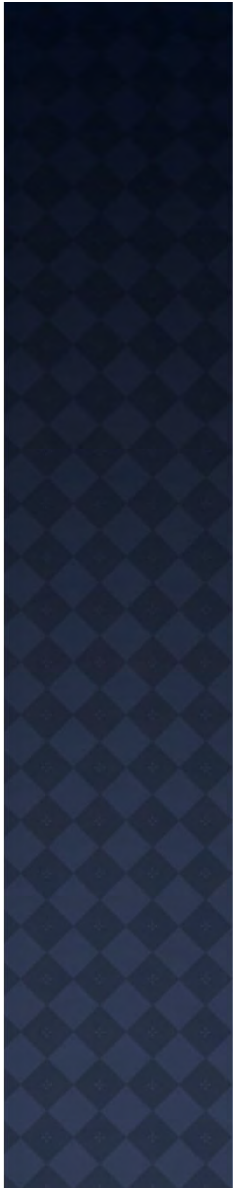
CASE: AVI - MEDICALLY FRAGILE INFANT



CASE: ROB - PHYSICAL ABUSE YOUNG ADULT



CASE: LIAM - INTERNATIONAL ADOPTEE



TRAUMATIC STRESS IMPACTS SENSORY INTEGRATION

- ◉ Dysregulates physical functioning
- ◉ Interferes with relationships
- ◉ Disrupts beliefs about oneself, others and the world
- ◉ Interferes with development of sensory, praxis and play



VULNERABLE POPULATIONS



- ◉ Post-institutionalized children from orphanages
- ◉ Children who have received foster care
- ◉ Premature infants/medically fragile
- ◉ Individuals with autism
- ◉ Inner city/ lower income

DIAGNOSES ASSOCIATED WITH SENSORY PROCESSING AND TRAUMA DIAGNOSES

- ⦿ ADHD, Learning Disorders and Developmental Coordination Disorders
- ⦿ Anxiety Disorders (including Obsessive-Compulsive Disorder, Panic)
- ⦿ PTSD/Attachment Disorders
- ⦿ Mood disorders (Major Depressive Disorder, Bipolar Disorder)
- ⦿ Oppositional Defiant/Conduct Disorder

RELATING SENSORY INTEGRATION AND TRAUMA



Many children who experience trauma demonstrate signs of sensory integration problems.



Some aspects of sensory processing dysfunction may be traumatizing to some children.



Understanding of the shared neurobiological foundations, mechanisms and effects of trauma and related attachment disorders and their relationship to sensory processing is rapidly developing.

SOURCES OF TRAUMATIC STRESS



⦿ Environmental:

- Man-made
- Natural disasters

⦿ Societal:

- Terrorism
- Community/school violence
- Military Combat
- COVID

SOURCES OF TRAUMATIC STRESS



Physical:

- Accidents
- Disease
- Medical procedures
- Birth trauma

Relational:

- Loss of a loved one
- Domestic violence
- Neglect
- Physical abuse
- Sexual abuse

TRAUMA, PRAXIS AND AROUSAL REGULATION

- ⦿ Regulation of arousal a primary concern in trauma interventions
- ⦿ Arousal regulation may be affected by
 - Sensory stimuli
 - Task demands
 - Motor skills
 - Emotional/social demands
- ⦿ Not all dysregulation of arousal is due to sensory may be due to praxis-related issues

PRAXIS AND TRAUMA

- ◉ Motor performance problems and developmental delays are recognized in children who demonstrate trauma and attachment concerns
- ◉ Praxis allows one to adaptively interact with the world of people and things around them
- ◉ Traumatic experiences interfere with the ability to adaptively interact with the world

PRAXIS AND TRAUMA

- ◉ The ability to make an adaptive response to an environmental demand.
- ◉ Issues that disrupt development of praxis interfere with adaptive behavior like play
- ◉ However, the motor implications of trauma is a little discussed area of functioning



PLAY AND TRAUMA

- ◉ Play depends on good praxis in typical development and is a mechanism by which children develop more complex praxis skills
- ◉ Play is part of development of and regulation of social behaviors...when children cannot play they cannot interact well with others
- ◉ Traumatic experiences are known to interfere with development of social aspects of play
- ◉ Play with caregivers can promote bonding and attachment



WHY TALK ABOUT PRAXIS AND PLAY

Understand

Understand the relationship between praxis, play, adaptive behavior and arousal regulation

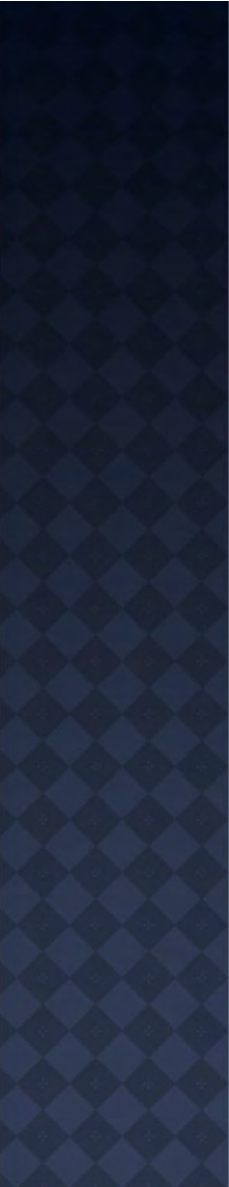
Understand

Understand what is known about the relationship between praxis, play, adaptive behavior and trauma and attachment concerns

Recognize

Recognize ways to begin to assess and address praxis, play and adaptive behavior in traumatized children.

WHAT DO WE KNOW ABOUT PRAXIS AND TRAUMA/ATTACHMENT



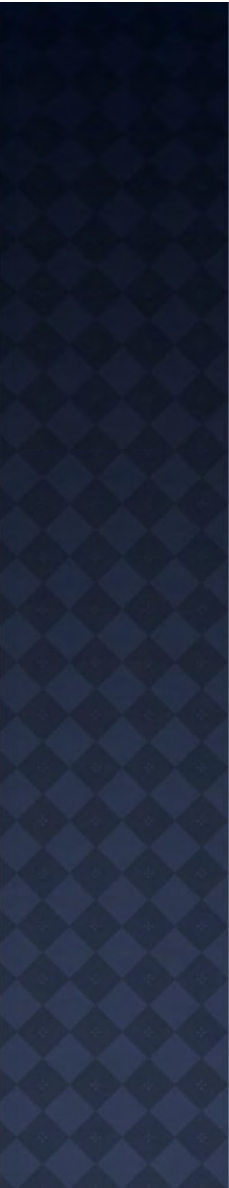
PRIMARY NEUROBIOLOGICAL CONSEQUENCES OF TRAUMA



Alterations in structure and
function of brain regions



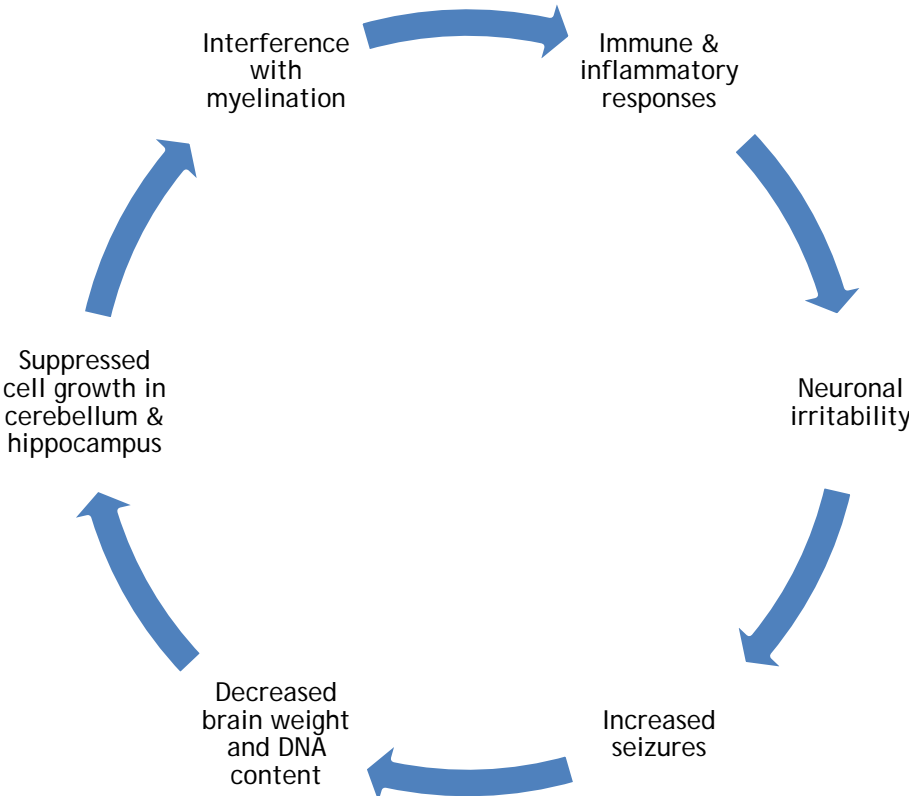
Alterations in brain connectivity
and network architecture



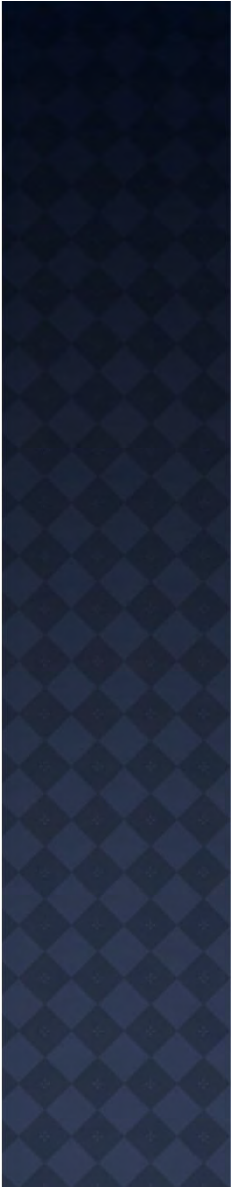
NEUROBIOLOGICAL AREAS OF IMPACT OF TRAUMA

- ⦿ Trauma impacts the following:
 - Maturation of specific brain structures at particular ages
 - Physiological and neuroendocrine responses
 - Capacity to coordinate cognition, emotional regulation and behavior
- ⦿ Understanding the multiple possible responses to fear, stress and trauma
 - Van der Kolk - Developmental Trauma
 - Porges - Polyvagal Theory

POOR CORTICOSTEROID METABOLISM



Teicher



HIPPOCAMPUS

Abnormalities associated with PTSD, stress disorder, major depression, schizophrenia, bipolar disorder, and borderline personality disorder

Is densely populated with glucocorticoid receptors & susceptible to high levels of glucocorticoids/cortisol

Adults with maltreatment have smaller hippocampus

Female hippocampus less vulnerable to effects of stress possibly due to protective effects of estrogen

Maybe a silent period between maltreatment exposure and neurobiological differences between puberty and adulthood

HIPPOCAMPUS

- ◉ Bilateral hippocampal volume affected by sexual abuse at 3-5 years but less at 11 - 13 years
- ◉ Right hippocampal volume sensitive at 7 - 14 years
- ◉ Early separation stress affects hippocampus more than prefrontal cortex
- ◉ Adolescent stress affects prefrontal cortex more than hippocampus
- ◉ Left hippocampus only affected at age 3 - 6 years by affluence-poverty ratio
- ◉ Right hippocampus affected by supportive-hostile parenting

IMPACT ON ASSOCIATION & POLYSENSORY CORTEX

Prefrontal area changes impact

- Decision making
- Emotional regulation
- Role in anticipation & lack of inhibition of addition
- Increases addition risk

Sexual Abuse associated with atypical gyri

- Medial & inferior frontal gyri
- Inferior & superior temporal gyri
- Precentral gyri and inferior parietal gyri

TRAUMA IMPACT ON SENSORY CORTEX

- ⦿ Young adults exposed to severe parental verbal abuse demonstrated deficits in
 - Left arcuate fasciculus
 - Links superior temporal gyrus with frontal cortex
 - Critical for language and praxis
 - Associated with decreased language comprehension and verbal IQ

TRAUMA IMPACT ON THE CEREBELLUM

- ⦿ High density of glucocorticoid receptors, especially in neonatal periods.
- ⦿ High levels of glucocorticoids in early development result in lower cerebellar volume in rats
- ⦿ Human studies find alterations in vermis in response to trauma
- ⦿ Other studies find decreased volume of cerebellar hemispheres

CEREBELLUM

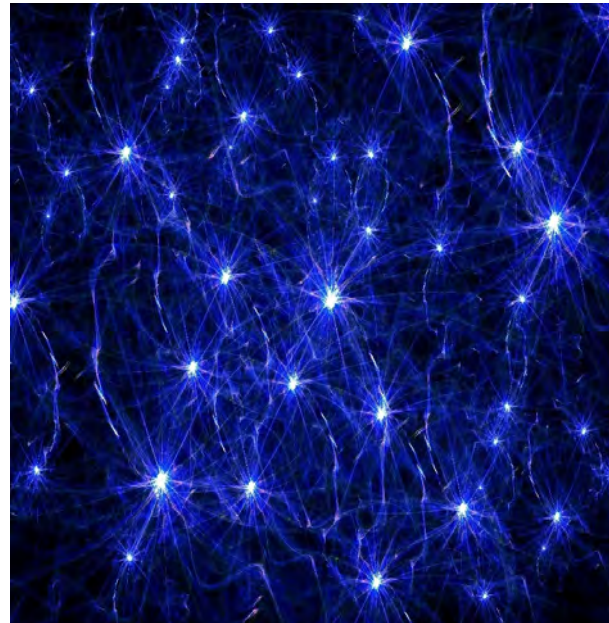
- ◉ Vermis of cerebellum considered to be the “limbic cerebellum”
 - has connections to the fastigial nuclei which goes to the limbic system
- ◉ Vestibular and proprioceptive inputs seen as protective in face of early separation and isolation
- ◉ Abnormal vermis volume seen in autism, ADHD, schizophrenia, bipolar and major depression

IMPLICATIONS FOR SENSORY INTEGRATION AND PRAXIS

- ◉ Vestibular-proprioceptive inputs may facilitate improvement
- ◉ Praxis, sequencing, judgment, anticipation may be impacted by deficits in this area.
- ◉ Implications for memory, storage of knowledge of events, retrieval of information
- ◉ Positive social relationships with positive attachment can help mitigate negative effects

TRAUMA AND NEURONAL MODELS

- ⦿ Trauma results in difficulties regulating emotions and behavior
 - Results in decreased attention and increased anxiety
- ⦿ Trauma interferes with the formation of neuronal models - needed for development of praxis



CONNECTIONS BETWEEN TRAUMA AND PRAXIS

- ⦿ Research on specific populations but not general trauma populations
 - Post-institutionalized children - adoptees
 - Deprivation
 - Decreased SIPT scores - PPr, OPr, PrVC, SPr
 - Decreased balance and bilateral coordination (cerebellar/vestibular)
 - Foster children who experienced trauma or neglect
 - 84% of children had problems with planning and ideas on SPM
 - Males had more “Some problems”; girls had more “definite problems”

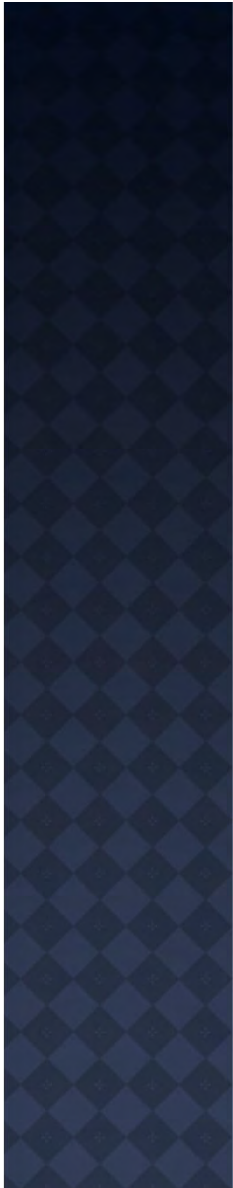
CONNECTIONS BETWEEN TRAUMA AND PRAXIS

- ⦿ Premature infants and medically fragile

- Delayed motor skills
- High incidence of SI problems
- Delayed somatosensory processing

- ⦿ Physically abused children

- Atypical motor patterns
- Lack of movement/passivity
- Delayed motor skills



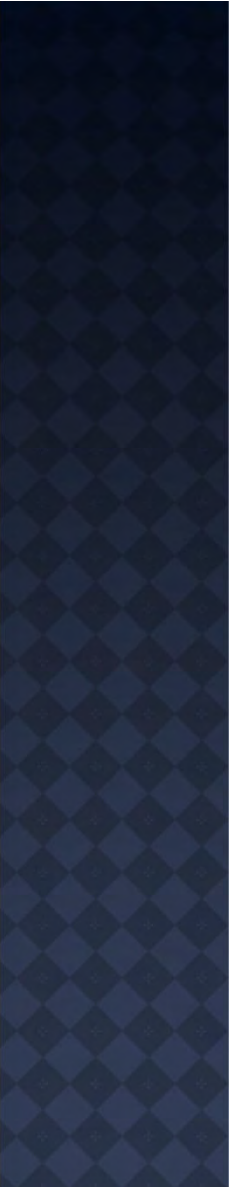
CONNECTIONS BETWEEN TRAUMA AND PRAXIS

⦿ Juvenile delinquents

- Fine motor problems
- Decreased praxis on SIPT
- Vestibular-related tests on SIPT

⦿ Mental health disorders

- Anxiety related to poor vestibular functioning
- Decreased balance



POTENTIAL NEUROBIOLOGICAL CONNECTIONS BETWEEN TRAUMA AND PRAXIS

◉ Martin Teichert, et al

- *Limbic irritability*
 - temporal lobe epilepsy, increased EEG (brain wave) abnormalities.
- *Deficient development and differentiation of the left hemisphere*
 - throughout cerebral cortex and the hippocampus (memory retrieval)

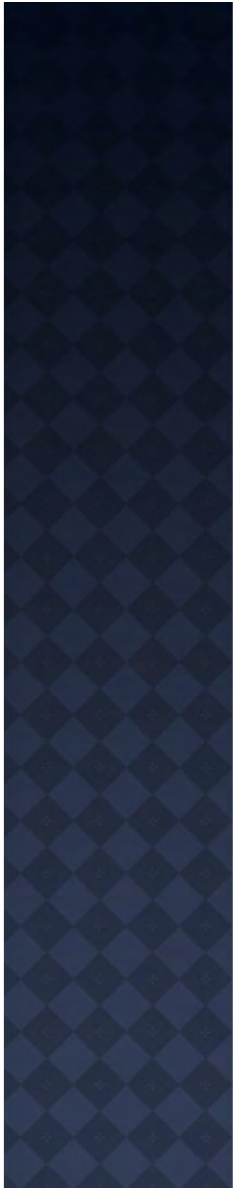


POTENTIAL NEUROBIOLOGICAL CONNECTIONS BETWEEN TRAUMA AND PRAXIS

- *Deficient left-right hemisphere integration*
 - shifts in hemispheric activity during memory recall
 - underdevelopment of middle portion corpus callosum
- *Abnormal activity in the cerebellar vermis*
 - plays role in emotional and attentional balance and regulates electrical activity in the limbic system

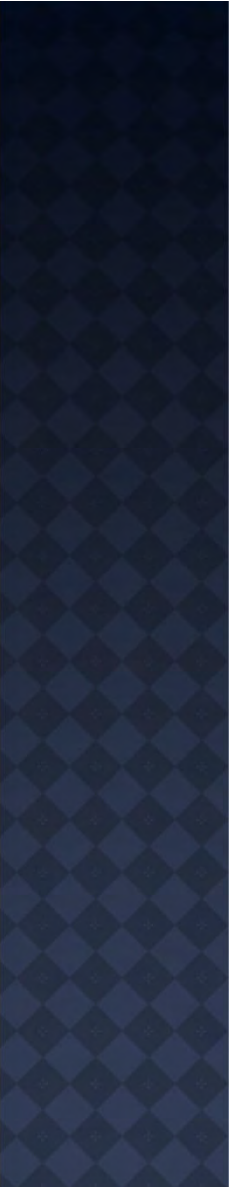


WHAT DO SENSORY AND PRAXIS ISSUES LOOK LIKE IN TRAUMATIZED CHILDREN



MAJOR PROBLEM AREAS TO EXAMINE

- ⦿ Sensory modulation
- ⦿ Sensory discrimination
- ⦿ Motor coordination
- ⦿ Behavior
- ⦿ Social-emotional difficulties
- ⦿ Performance daily life skills
- ⦿ Play



IMPORTANCE FOR SENSORY INTEGRATION

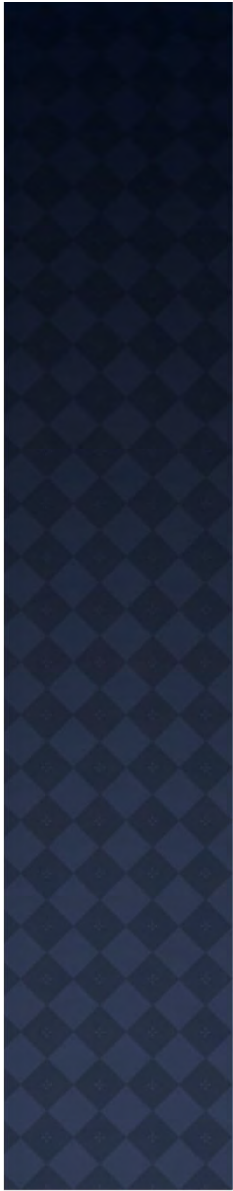
Behavioral
dysregulation

Trauma-related
hyper-arousal

Fight/flight/freeze
reactions

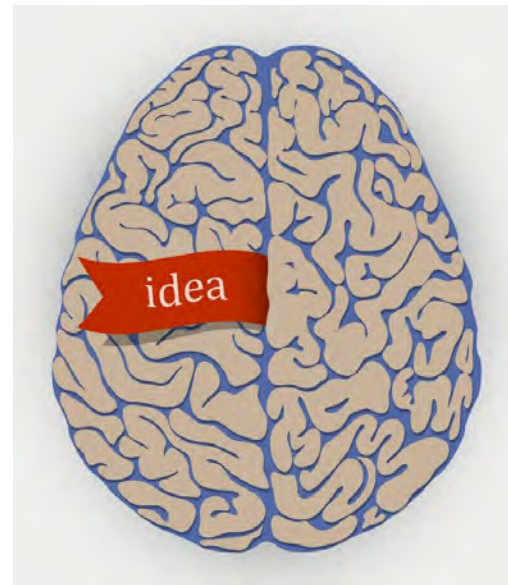
Numbing on a
deeply somatic
level -dissociation

Similarities and
differences to
Sensory Processing
Disorder



ASPECTS OF PRAXIS TO ADDRESS

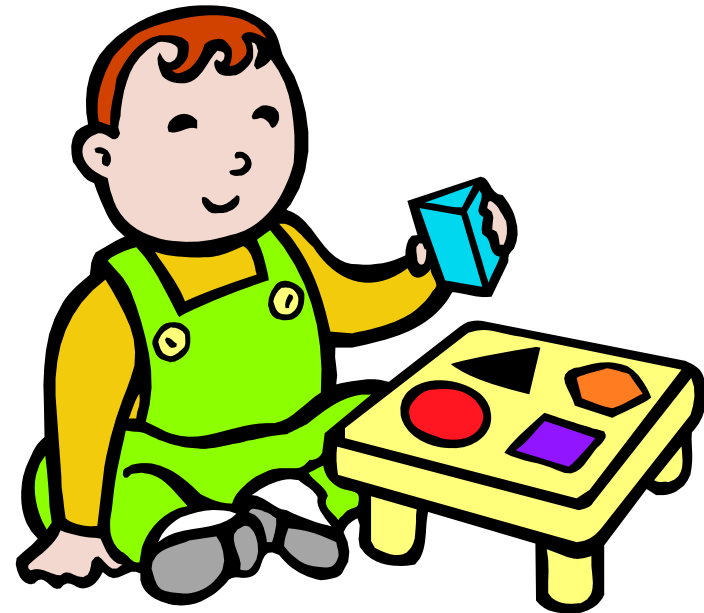
- ◉ Ideation
- ◉ Motor Organization
- ◉ Feedback
- ◉ Feedforward
- ◉ Sequencing/Organization



IDEATION

Definition:

- The process of conceptualizing intentional and purposeful actions, identifying a goal for the action, accessing internal schemas of the action, and motor preparation of the act.
- Is dependent on the knowledge of action and object affordances



MOTOR ORGANIZATION

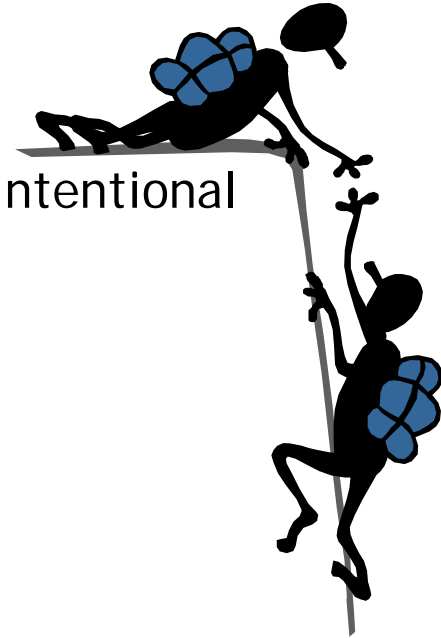
- Organizing actions for use
- Motor Planning
- Bilateral Coordination
- Projected Action Sequences



MOTOR PLANNING

◎ Definition:

- The ability to plan, order and sequence a series of intentional motor actions
- Related to and depends on the ability to sequence
- Depends primarily on somatosensory inputs



BILATERAL COORDINATION

◎ Definition:

- Involves organization and coordination of various parts of the body
- Depends primarily on vestibular inputs
- Develops from primitive postural reflexes



PROJECTED ACTION SEQUENCES

⦿ Definition:

- Involves planning and organizing actions that require timing and movement through space
- Usually performed automatically and planning is largely unconscious
- Depends primarily on vestibular, proprioceptive, and visual inputs



CHARACTERISTICS OF CHILDREN WITH PRAXIS DISORDERS

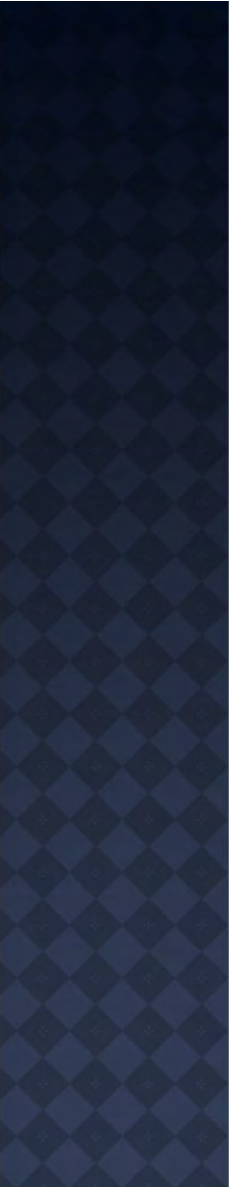
- ⦿ Clumsy child
- ⦿ Problems with sports, dressing, eating, handwriting
- ⦿ Disorganized
- ⦿ Longer than average to learn new tasks
- ⦿ Frustrated
- ⦿ Does not know what to do
- ⦿ Maybe socially awkward in a physical sense
- ⦿ Poor body awareness
- ⦿ Poor impulse control

SYMPTOMS OF MOTOR PLANNING CHALLENGES

- ⦿ Needs more practice than other children to learn new skills.
- ⦿ Poor self-esteem, lack of confidence.
- ⦿ Avoids physical education or sports activities.
- ⦿ Finds it difficult to make friends with children of the same age, prefers to play with adults or younger children rather than peers.
- ⦿ Difficulty following several step instructions for motor tasks.

DECREASED IDEATION

- ⦿ Difficulty with novel experiences
- ⦿ Refusals or avoidance of new physical tasks
- ⦿ Low frustration tolerance for learning
- ⦿ Decreased exploration or exploratory play
- ⦿ May be bossy or controlling to the extent of bullying



DECREASED MOTOR PLANNING

- ⦿ Decreased ability to plan, organize or complete occupations
- ⦿ Decreased pride and confidence in abilities
- ⦿ Decreased perceptions of mastery of environment
- ⦿ Difficulties planning body movements
- ⦿ Closely monitors others doing tasks
- ⦿ Avoidance of or asks assistance for challenging tasks
- ⦿ Repetition of unworkable plans

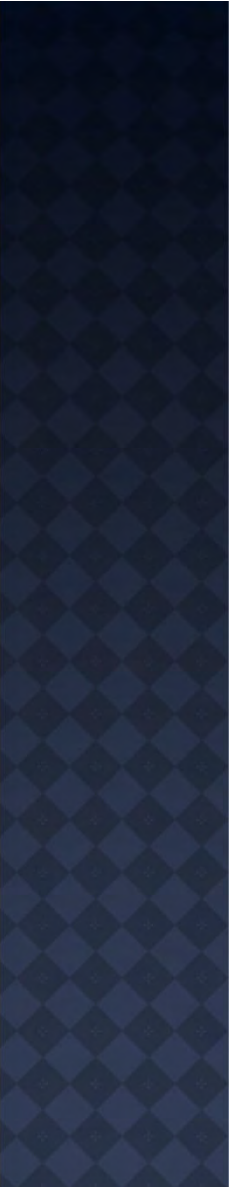
DECREASED SEQUENCING AND ANTICIPATION OF ACTION

- ⦿ Problems following directions
 - ⦿ Difficulty with multi-step activities
 - ⦿ Difficulty anticipating upcoming events
-
- ⦿ Motor problems can manifest differently in different clients depending on type of trauma and other factors

ASPECTS OF PLAY DEVELOPMENT TO ADDRESS

- ⦿ *Demonstration of constructs of play*
 - characteristics that make something play
- ⦿ *Types of play*
 - Function and nature of play behavior
- ⦿ *Developmental levels*
 - Stages and progression of play skills,
- ⦿ *Social stages of play*
 - Ways that children play in relation to others
- ⦿ *Playfulness*
 - Approach that one takes toward an activity to make it play.

ASSESSMENT CONSIDERATIONS FOR CHILDREN WITH TRAUMA AND ATTACHMENT CONCERNS

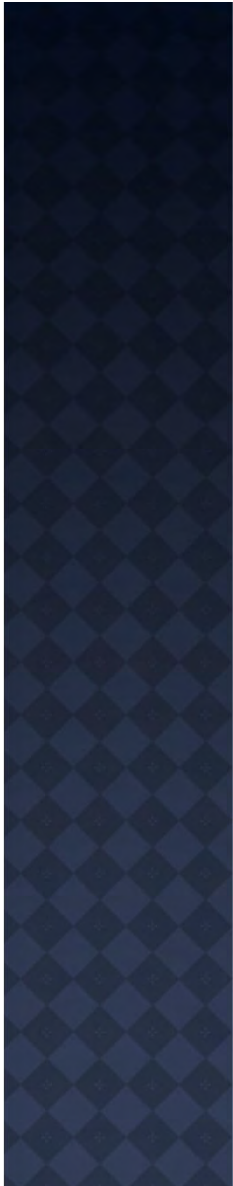


IMPORTANCE OF ASSESSMENT

- ⦿ Behaviors can often be misinterpreted as intentionally disruptive or obstinate, etc. when they are based in the child's own sensory experience which is quite different from ours or other children's.
- ⦿ Sensory processing problems are often quite treatable even in older adults. Changes in sensory processing can be transformative at any age.

AREAS TO ASSESS

- ◉ Sensory Integration
 - Sensory Modulation
 - Sensory Discrimination
 - Praxis
- ◉ Screen for Mental Health Concerns
 - Depression
 - Anxiety
 - Attachment
 - Trauma
- ◉ Parent-Child Fit
- ◉ Parental Sensory Processing Style



POSSIBLE SENSORY INTEGRATION PROFILES



- ◉ Vestibular bilateral integration and sequencing problems
- ◉ Proprioceptive problems - dissociation
- ◉ Tactile problems - defensiveness
- ◉ Postural ocular problems - weak tone and teaming of eyes
- ◉ Sequencing, anticipatory actions, planning

MAJOR PROBLEM AREAS

- **Filtering problems - Sensory Modulation** -over or under-responsivity, resulting in increased arousal, flight, fight, freeze, creating difficulties in coping with many typical daily activities such as shopping, parties, cafeterias, etc. Low arousal can also occur where it takes a lot of stimulation to make an impression on the nervous system.
- **Perceptual motor problems - Sensory Discrimination** - poor body awareness and poor sense of position in space, creating motor coordination and planning (praxis) problems, resulting in frustration, anxiety.

SENSORY DISCRIMINATION CHALLENGES

- ⦿ Poor touch (tactile) awareness and poor muscle and joint awareness (proprioception) resulting in poor body scheme awareness, clumsiness and frustration
- ⦿ Poor balance and movement awareness from the inner ear (vestibular system) resulting in poor safety awareness or over cautiousness, poor rhythm, timing, sequencing

SENSORY INTEGRATION AND MOTOR ASSESSMENTS

- ⦿ Infants - Test of Sensory Functions in Infants
- ⦿ Preschoolers - Miller Assessment for Preschoolers/EASI/SP-3D
- ⦿ School age - Sensory Integration and Praxis Tests (SIPT)/EASI/SP-3D
- ⦿ Adolescents - Bruininks Oseretsky/Movement Assessment Battery for Children-2 (MAB-C2)/observations with SIPT subtests
- ⦿ Ayres Clinical Observations of neuromuscular development added to all of the above

SENSORY-MOTOR SCREENING MEASURES FOR MENTAL HEALTH PROFESSIONALS

How Do I Know?

(OTA The Koomar Center, 2012)

Sensory Profile - 2 (Dunn, 2014)

Sensory Processing Measure

(Parham, Ecker, Miller Kuhaneck, Henry & Glennon, 2007)

Developmental/Sensory History

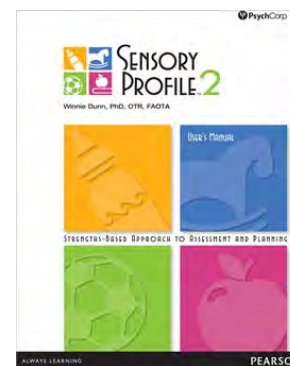
(OTA The Koomar Center, 2011)

Movement ABC - 2 - Checklist

(Henderson, Sugden & Barnett, 2007)

Developmental Coordination Disorder Questionnaire 2007 - DCDQ'07 (Wilson, et al, 2007)

© T May-Benson, 2021



TRAUMA AND ATTACHMENT SCREENING TOOLS FOR OCCUPATIONAL THERAPISTS

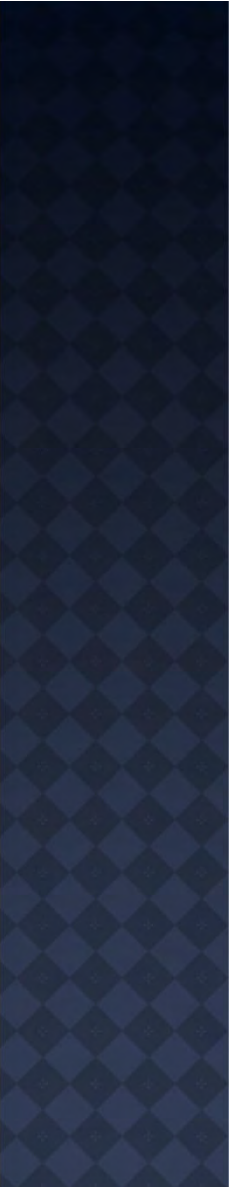
- ⦿ Trauma Screening Questionnaire
 - *Brewin, 2002*
- ⦿ Child Trauma Screening Questionnaire
 - *Kenardy, Spence, & Macleod, 2006*
- ⦿ Traumatic Life Events Questionnaire
 - *Kubany, 2000*
- ⦿ Life Event Checklist for DSM-5 (LEC-5)
 - *Weathers, et al, 2013*
- ⦿ Attachment Questionnaire for Children
 - *Muris, Meesters, van Melick, & Zwambag 2001*
- ⦿ Attachment Insecurity Screening Questionnaire
 - *Wissinik, et al, 2016*



ADDITIONAL ASSESSMENT

- Trauma Symptom Checklist of Young Children (TSCYC) (ages 3-12)
- Trauma Symptom Checklist for Children (TSCC) (ages 8-16)
- Children's Impact of Traumatic Events Scale (CITES-R) (ages 8-16)
- Toddler Attachment Checklist
Working Draft by Lynne Lyon MSW, LCSW
- Family Sensory Preferences
- Parenting Profile for Developing Attachment

IMPLICATIONS OF PRAXIS ASSESSMENT FINDINGS



IMPLICATIONS OF ASSESSMENT FINDINGS

- ⦿ What is sensory integration and what is trauma-related?
 - Use of developmental history
 - May not be able to tell
- ⦿ Awareness of possible trauma triggers and guidance for intervention
- ⦿ When in high arousal cannot access praxis skills

CONSIDERATIONS WHEN ASSESSMENT OF PRAXIS WITH TRAUMATIZED CHILDREN



- ⦿ Trauma triggers
- ⦿ Dissociation & safety
- ⦿ Playing with fears
- ⦿ Competition

ASSESSMENT WITH TRAUMA TRIGGER MANAGEMENT

- ⦿ Triggers related to personal safety
 - Touch
 - Proximity
 - Tone of voice
- ⦿ Orphanage or foster care specific fears
 - Restraints
- ⦿ Sensory specific triggers
 - Sounds
 - Smells
- ⦿ Shame based triggers

CONSIDERATIONS WHEN ASSESSING PRAXIS WITH TRAUMATIZED CHILDREN

- ◉ Superhero play
- ◉ Lovies, transitional objects, substitutes
- ◉ Storytelling



THANK YOU!!! QUESTIONS??

