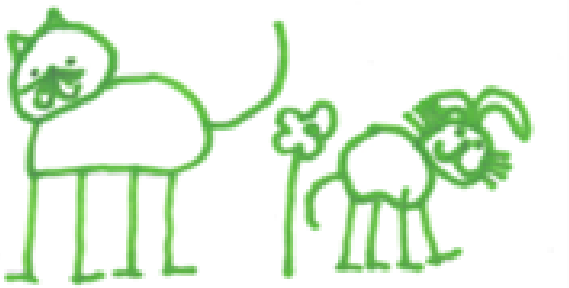


Sensory Integration for SLTs

Amy Stephens
Highly Specialist Speech & Language Therapist
Advanced Practitioner, Sensory Integration

Handouts here:
Password = Smart

Orientation to Sensory Integration and Processing challenges

What barriers to participation do your clients experience which you suspect may reflect sensory processing challenges?

Plan for Today

- Review sensory systems and sensory processing
- Neuroscience – sensory processing for neural organisation and learning
- Engagement, participation and communication challenges
- SI therapy principles and strategies
- Onward learning and further information

"Sensory integration...the ability to organize sensory information for use, results in perception and… synthesis of sensory data that enables [people] to interact effectively with the environment." Jean Ayres (1971)

Image – Pixabay

Sensory Integration

- Continuous, whole-brain process
- Adaptive responses create neural network
- Inner drive to develop adaptive responses
- Central Nervous System (CNS) is plastic, and can change across the life span

Sensory Systems

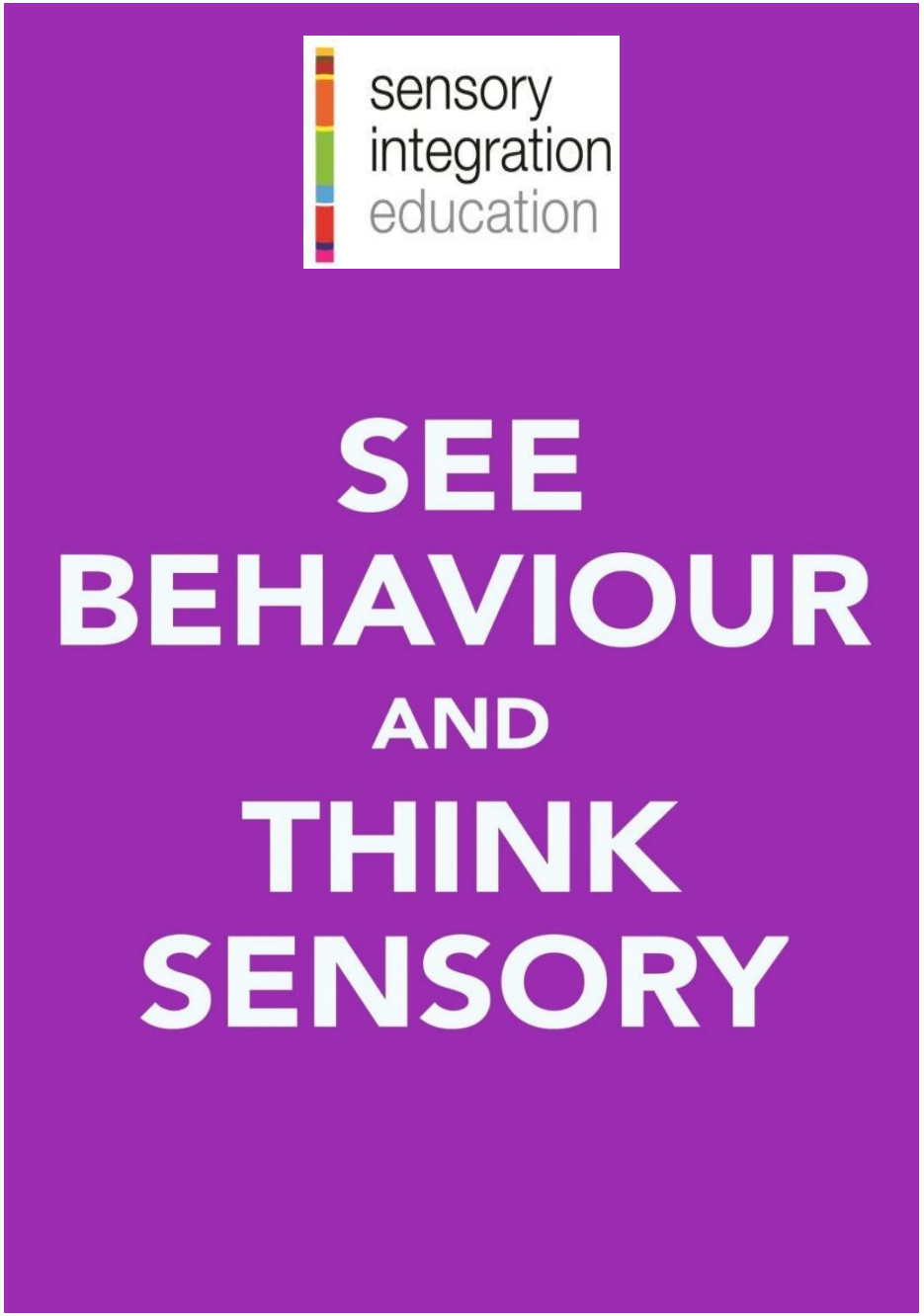
Layman's term	Medical Term	End organ	Stimulus
Sight			
Hearing			
Touch			
Smell			
Taste			
Body awareness			
Head position/ movement			
Internal sensations			

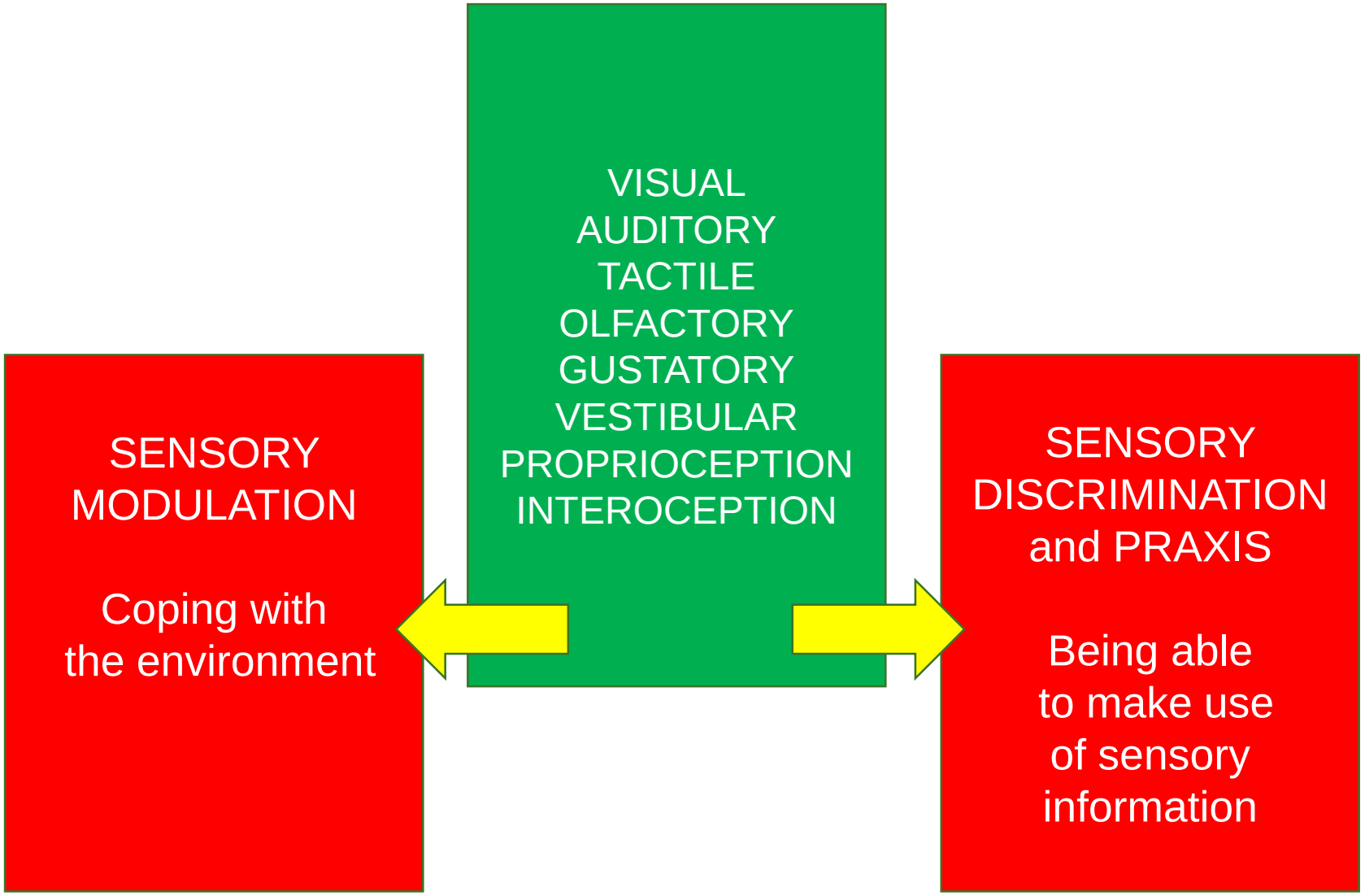
Sensory Systems

Layman's term	Medical Term	End organ	Stimulus
Sight	Visual	Retina (back of eye) Rods and cones	Light
Hearing			
Touch			
Smell			
Taste			
Body awareness			
Head position/ movement			
Internal sensations			

Sensory Systems

Layman's term	Medical Term	End organ	Stimulus
Sight	Visual	Retina (rods, cones)	Light (intensity, hue, movement)
Hearing	Auditory	Cochlea (hair cells)	Vibration
Touch	Tactile	Skin	Temperature, light touch, pain, pressure, skin stretch
Smell	Olfactory	Nose (olfactory receptors)	Airborne chemical particles
Taste	Gustatory	Tongue (taste buds)	Chemical particles
Body awareness	Proprioceptive	Muscle spindles, joint capsules	Movement
Head position/ movement	Vestibular	Labyrinths and otoliths	Head movement
Internal sensations	Interoceptive	Digestive tract locations e.g. sphincters	Pressure, stretch as a consequence of digestion


sensory
integration
education
SEE
BEHAVIOUR
AND
THINK
SENSORY


VISUAL
AUDITORY
TACTILE
OLFACTORY
GUSTATORY
VESTIBULAR
PROPRIOCEPTION
INTEROCEPTION
SENSORY MODULATION
Coping with the environment
SENSORY DISCRIMINATION and PRAXIS
Being able to make use of sensory information

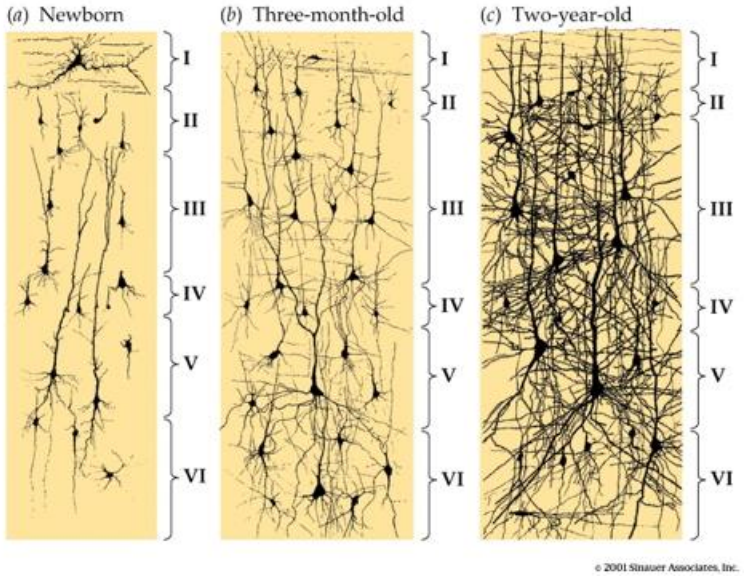
Sensory processing and integration as a developmental process

Image – Pixabay

Sensations are ‘food’ or nourishment for the nervous system, the brain needs continuous variety of sensory nourishment to develop and then to function

Ayres 1979

Sensation: Building Brains



- Synaptogenesis
- Experience-dependent cortical organisation
- Synaptic pruning

Clinical populations with differences in sensory processing

- Autism
- Premature birth
- Conditions resulting from Infections and illnesses
- Foetal Alcohol Syndrome
- Neglect and trauma
- Mental Health conditions including depression, anxiety and schizophrenia
- Physical disabilities
- Hearing loss
- Dyslexia, dyscalculia, auditory processing disorders
- DCD/Dyspraxia
- Intellectual disabilities
- Acquired neurological conditions, esp. dementias

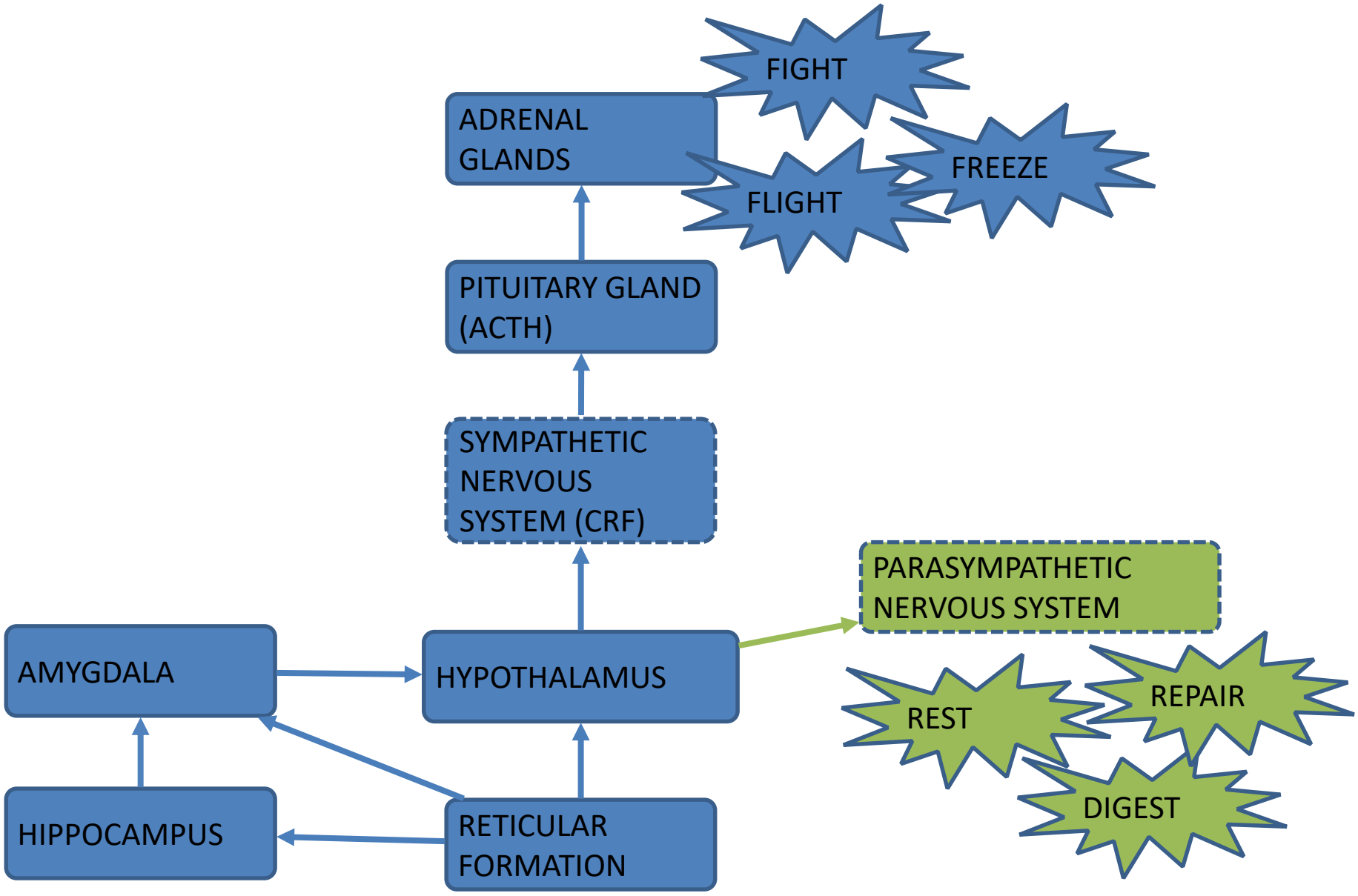
Sensory processing and arousal regulation

Arousal and Regulation

“An optimum level of arousal represents the level of neuron excitability needed to remain focused on the task in hand”

Dahl Reeves (2001)

Thresholds for Response


FIGHT
ADRENAL GLANDS
FREEZE
FLIGHT
PITUITARY GLAND (ACTH)
SYMPATHETIC NERVOUS SYSTEM (CRF)
PARASYMPATHETIC NERVOUS SYSTEM
AMYGDALA
HYPOTHALAMUS
REST
REPAIR
DIGEST
HIPPOCAMPUS
RETICULAR FORMATION


SEE
BEHAVIOUR
AND
THINK
SENSORY

Homeostasis

Image – Pexels.com

How the brain works to balance acceleration (fight-flight-freeze) with braking (rest-digest-repair) across the activities of the day.

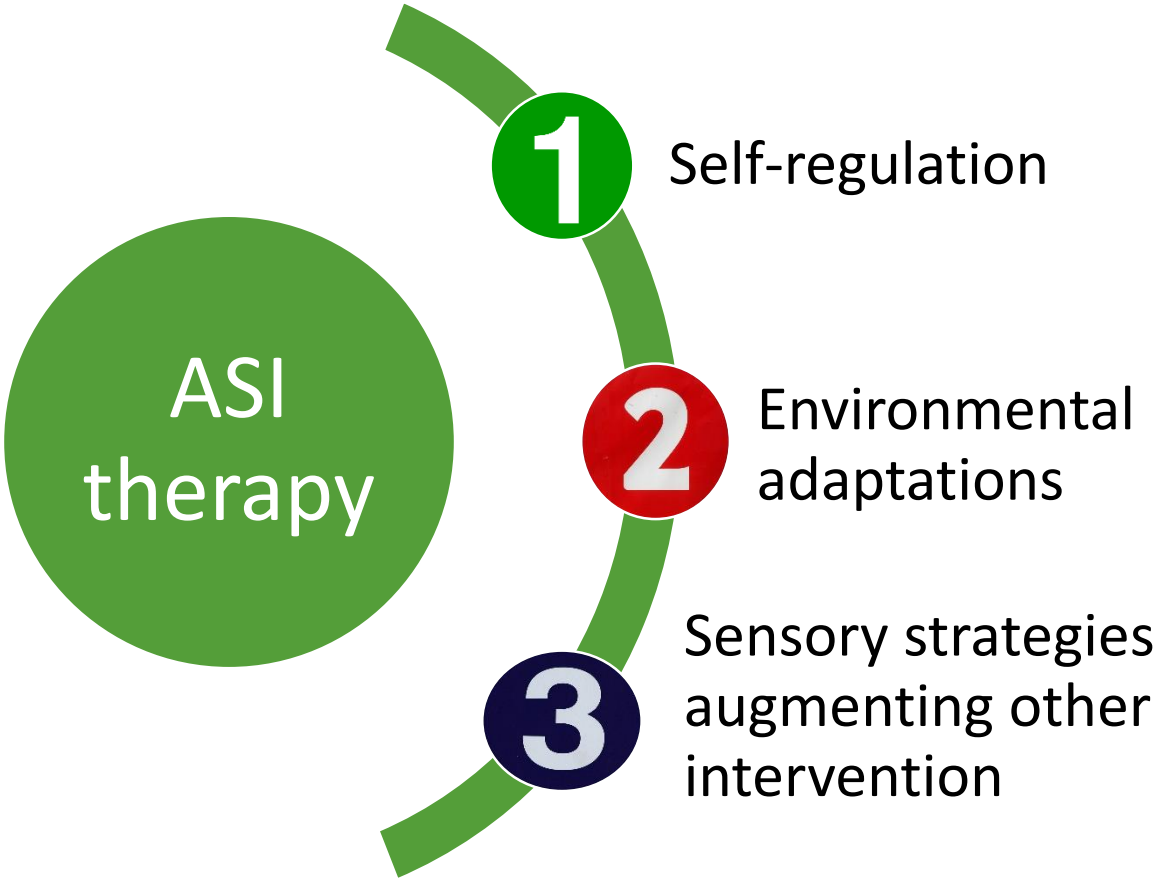
The optimal state of arousal is calm and alert.

HYPO-RESPONSIVITY	HYPER-RESPONSIVITY
Difficulty sitting still and attending	*Hypervigilence, difficulty achieving and maintaining a calm, alert state*
Slow to notice stimuli	*Strong/extreme response to stimuli*
Slow to marshal a response to stimuli	*Possible limbic system responses to stimuli*
Sensory seeking behaviours	*Sensory avoiding behaviours*

Underpinning principles for working within an SI frame of reference

- Sensory intake and processing underpins planning and carrying out activities.
- Differences in an individual's ability to process sensation can interfere with participation, learning and behaviour.
- Targeted sensory opportunities, as part of meaningful activity that yields an adaptive interaction, improve the ability to process sensation, thereby enhancing participation, learning and behaviour.

Complementary Intervention Strands



What can I do?

“The Central Nervous System was not at all designed to sustain attention and engagement in a sedentary position”

Emily Ruben, SCERTS 2013

- Notice what is happening. Appropriate framing is a huge benefit to you, to the client and to making the most of the resources available.
- Proprioception is always organising and calming. Think push-pull-stretch-lift-carry.
- Adapt therapy activities to embed sensory opportunities rather than adding in separate sensory activities
- Consider whether your therapy is playful – across the age range – and whether there are opportunities for exploration and adaptation about how the client participates.

Further information and training

- www.sensoryintegration.org.uk
- Facebook – Sensory Integration Network UK
- Facebook – SI CEN

SI CEN Mailing List

https://mailchi.mp/c28fd6bb66df/sensoryintegrationcen?fbclid=IwAR0JGr3yFCswffK91d8zH-RPSHoZl2--BAGH_Zi2JhbGLJ36dhvWjisgzxo

References and further reading

Ayres, AJ (1972) Sensory Integration and Learning Disorders. Los Angeles: Western Psychological Services.

Ayres, AJ (1979/2005) Sensory Integration and the Child – 25th Anniversary Edition. Western Psychological Services, Los Angeles

Ahn RR, Miller LJ et al (2004) Prevalence of parents' perceptions of sensory processing disorders among kindergarten children.American Journal of Occupational Therapy 58(3):287-93.

Baranek G, Foster L et al (1997) Sensory defensiveness in persons with developmental disabilities. Occupational Therapy Journal of Research 17(3): 173-85

Bharadwaj SV, Daniel LL, et al (2009) Sensory Processing Disorder in Children with Cochlear Implants. American Journal of Occupational Therapy 63:2 pp208-213

Blanche EI (2002) Observations Based on Sensory Integration Theory. Pediatric Therapy Network, Western Psychological Services, Los Angeles

Bundy AC and Murray EA (2002) Sensory Integration: A.Jean Ayres' Theory Revisited. In Sensory Integration – Theory and Practice (2nd Ed), Bundy AC, Lane SJ et al (Eds) , F.A. Davis Company, Philadelphia.

Dawson G and Watling R (2000) Interventions to facilitate auditory, visual, and motor integration in autism: a review of the evidence. Journal of Autism and Developmental Disorders 30(5):415-21.

Dunn W (1999) Sensory Profile. The Psychological Corporation, USA

Kranowitz CS (2005) The Out-of-Sync Child, Perigee, Penguin, London

Lesny I, Stehlik A et al (1993) Sensory disorders in cerebral palsy: two-point discrimination. Developmental Medicine and Child Neurology 35(5):402-5.

Mailloux Z, May-Benson TA et al (2007) Goal Attainment Scaling as a Measure of Meaningful Outcomes for Children with Sensory Integration Disorders. American Journal of Occupational Therapy 61:2 pp 254-259

May-Benson TA, Koomar JA et al (2009) Incidence of pre-, peri- and post-natal birth and developmental problems of children with sensory processing disorder and children with autism spectrum disorder. Frontiers in Integrative Neuroscience 3 Article 31 pp 1-12

Miller LJ, Anzalone ME et al (2007) Concept Evolution in Sensory Integration: A Proposed Nosology for Diagnosis. American Journal of Occupational Therapy 61(2) 135-140

Murray-Slutsky, C and Paris, BA (2005) Is It Sensory or Is It Behavior? Hammill Institute on Disabilities, Austin, Texas.

Parham LD, Cohn ES et al (2007) Fidelity in Sensory Integration Intervention Research. American Journal of Occupational Therapy 61:2 pp 216 – 227

Reisman J & Hanschu B (1992) Sensory Integration Inventory-Revised for Individuals with Developmental Disabilities. Hugo MN, PDP Inc Press

Rhoades EA and Chisolm TH (2001) Global language progress with an auditory-verbal approach for children who are deaf or hard of hearing. Volta Review 102:5-24

Schaaf RC and Miller LJ (2005) Occupational therapy using a sensory integrative approach for children with developmental disabilities. Developmental Disabilities Research Reviews 11(2):143-8

Schaaf RC and Smith Roley S (2006) Sensory Integration: Applying Clinical Reasoning to Practice with Diverse Populations. Pro-Ed Inc., Austin, Texas.

Smith Roley S, Blanche, EI et al (2001) Understanding the Nature of Sensory Integration in Diverse Populations. Psychological Corporation, San Antonio, Texas

Stickids, Muscles, Motion ‘n Touch (2005) Community Therapy Associates Inc, Alberta, Canada

Yekutiel M, Jariwala M et al (1994) Sensory deficit in the hands of children with cerebral palsy: a new look at assessment and prevalence. Developmental Medicine and Child Neurology 36(7):619-24