A person is captured in mid-air, jumping joyfully with their arms and legs spread wide. They are silhouetted against a bright, low sun on the horizon, which creates a warm, golden glow. The sky is a mix of blue and orange, with scattered white clouds. The foreground shows the tops of tall grasses in a field. The overall mood is one of freedom and happiness.

# SI in the field of adult psychiatry

Irina Katajisto-Korhonen  
2022

Baltic-Nordic Sensory Integration Congress

# About me

Occupational Therapist since 2005 (master's degree 2016):  
worked in care home / assisted living for mental health  
clients

Vocational Teacher (2018)

Sensory Integration Practitioner (2021, Sensory Integration  
Education)

Entrepreneur in Laatuterapia Terapiapalvelut (lecturer, writer,  
developer, 2016 ->)

Lecturer in Turku University of Applied Sciences (full time  
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# Sensory integration from adult perspective (in general)

- "Adults with SI and processing issues are an underserved and underidentified group despite an emerging body of literature supporting the presence of sensory processing deficits in adult populations."
- Children whose sensory processing and integration problems continue to adulthood, some are first identified in adulthood.
- Sensory processing problems can occur in general adult population (without mental or physical health conditions)
- May not be aware of sensory processing disorder – might consider it to be as part of their constitutional makeup (aspect of behavior, personality or temperament)
- Develop often effective coping mechanism (e.g. avoiding, preparing for situations) to manage difficult situations – techniques can be exhausting / time consuming, and don't take the problem away...

*(Pfeiffer 2020)*



# Typical sensory processing difficulties with mental health clients



- **Sensory processing issues** are seen in many different diagnoses (schizophrenia, anxiety disorders, personality disorders, autism spectrum disorder, PTSD, psychosis) (*Azuela 2018*)
  - eg. Sensitivity to particular sensations, fail to notice sensory stimuli, difficulties filtering sensory input (*Bobier et al. 2015*)
- Many MH clients face challenges in regulating arousal and emotions (Bobier et al. 2015)
- People with sensory overresponsivity are at higher risk for mental health issues and decrease in social functioning (*Kinnealey 2011*)





Sensory processing difficulties -> negative affect on occupational engagement + withdrawal from social situations (*Williamsson 2017, Andersson et al. 2020*) -> negative influence on personal recovery (*Andersson et al. 2020*)



Many MH clients (+ substance users, clients with trauma history) are not aware of their own sensory needs or reactions to stress (*Andersson et al. 2020*)



# Schizophrenia

- On Brain level (*Brown 2019*):
  - Enlargement of cerebral ventricles and decrease of gray matter in cortical areas.
  - Brain changes are seen before the outbreak of SCH -> more synapse pruning in youth?
  - Dopamine regulation dysfunctions
- Sensitivity to stress (reinforce psychosis) (*Brown 2019*)
- On CNS level disturbances that affect the ability to interpret and organize sensory information efficiently (*Machingura et al. 2018*)
- Aberrant & reduced neural activity in several brain regions which involve multisensory integration (temporal cortex, frontal & occipito-parietal [ the dorsal stream] regions). (*Gröhn et al 2022*)

- **Abnormal patterns of sensory processing**, even prior to the onset of schizophrenia (*Lipskaya-Velikovsky et al. 2015*)
- Schizophrenia **seems to affect all sensory modalities**, most significant impairments in **visual** and **auditory** system. (*Lipskaya-Velikovsky et al 2015*)
- Individuals with schizophrenia can experience reduced **proprioception**, which may lead to motor symptoms and difficulties in self-awareness (*Harrison et al 2019, Bailliard & Whigham 2017*).
- *Machingura et al. (2018) systematic literature review*: decreased patterns of sensation avoiding and low registration and decreased pattern of sensory seeking, there was a significant relationship between sensory defensiveness and anxiety.





# Anxiety disorders



- Stress reaction strong contributing factor
- On brain level:
  - Amygdala critical in fear and anxiety, but also other neural structures are responsible for anxiety (medial prefrontal cortex, hypothalamus, hippocampus)
  - Dysregulation of HPA-axis (hypothalamic-pituitary-adrenal -axis)
  - Elevated cortisol levels
  - GABA receptor system is implicated in panic disorder and general anxiety disorder (supports emotional modulation by producing a calming effect when faced with stressful situation)
  - Serotonin key neurotransmitter when managing fear

*(Davis & Noyes 2019)*

- Adults with **sensory over-responsivity** demonstrate **depression, anxiety and maladjustment**  
-> affects the **ability to fully participate and engage** in everyday occupations  
(*Lipskaya-Velikovsky ym. 2015; Kinnealey ym. 2011, Wallis ym. 2018*)
- Anxiety disorder (+ PTSD) clients may have **associated sensory processing issues**, including difficulties in **filtering out** less important sensory stimuli and **hypersensitivity** to specific input. (*Andersson et al 2020*)
- Many studies support relationship between **sensory over responsiveness**, but also **sensory under responsiveness** patterns or **low sensory registration** has been linked with trait anxiety. Also **problems with vestibular functioning** is seen (*Champagne & Pfeiffer 2020*)
- **Panic disorder**
  - **Interoception** central in the disorder, increased interoceptive sensitivity (*Harrison et al 2015*)

# Obsessive-compulsive disorder



- Sensory processing differences have been proposed in both adults and children with OCD; increased **sensory sensitivity**, **sensation avoiding behavior**, **compulsions to relieve or gain sensory stimuli** (rather than compulsions or obsessions), e.g. pursuing **"just right"** perceptions. **Ritualistic behaviors** are developed in response to abnormal sensory experience in order to create control over one's sensory environment. (*Harrison et al. 2019, Ben-Sansson et al. 2017*)
- People with OCD often describe **not just right experiences**, resembles sensory over-responsivity: **being bothered how things feel** on the skin, certain **sounds are distressing**, **rigid preference** for certain tastes and clothing. -> Traditional medication + methods (CBT, exposure and response prevention) may be less effective (*Ben-Sansson et al 2017*) -> *OT: integrated sensory-based CBT, which incorporates sensory knowledge, exposure and calming techniques*
- Aberrant sensory gating of **auditory stimuli** -> inability to filter out irrelevant information + **higher** scores on low registration, sensory sensitivity, sensation avoiding, **lower** scores on sensation seeking (*Bailliard & Whigham 2017*)

# Mood disorders

- Dysregulation of energy and arousal level are common in mood disorders and appear quite similarly in individuals with sensory modulation disorders (*Champagne & Pfeiffer 2020*)

On brain level:

- Neurochemical imbalance (norepinephrin, serotonin): depression associated with decreased availability of neurotransmitters, in mania excess activity
  - Prolonged stress and effects on HPA axis
  - Circadian rhythms are affected in both, depression and bipolar disorder (e.g sleep disturbances)
- > overall disorders in homeostatic mechanism

(*Tse & Spangler 2019*)



## Bipolar disorder

- Inability to filter irrelevant auditory information
- Basic auditory deficits have been linked to impairments in emotion recognition
- Disruptions at the latest stage of visual processing
- Higher scores on sensation avoiding behavior

*(Bailliard & Whigham 2017)*

## Depression

- Visual and auditory sensory experiences often accompany depressive thoughts
- Can affect all senses (*Blurt team*)





# Personality disorders

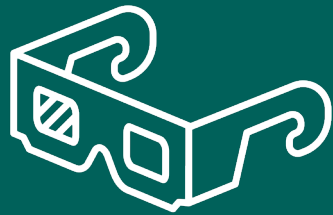
- Abnormal findings at the brain level:
    - In amygdala in paranoid personality disorder
    - In the temporal lobes in schizotypal personality disorder
    - In the prefrontal cortex in borderline and antisocial personality disorder
    - In the fronto-limbic regions in narcissistic and obsessive-compulsive personality disorders
  - **Many clients have trauma background**
  - Impulse control problems
- (Doughty & Brown 2019)*
- BDP: sensory sensitivities, sensory seeking behaviors, missing interoceptive signals (Fitzgibbon & O'Sullivan n
  - BDP may be confused with SDP (sensory processing disorder) – both have sensory hypersensitivity and sensory avoidance -> SI -based sensory processing therapy is recommended (Brown, Shankar & Smith 2009)



# Eating disorders

- Deficits in interoception associated with disordered eating behaviors (*Martin et al 2019*)
- Anorexia and bulimia may have altered taste perception, which may contribute to alterations in food consumption. (*Harrison et al. 2019*)
- Serotonin dysregulation (which may be aggravated by dieting) (*Lock & Pépin 2019*)
- *ARFID*: presentations of sensory sensitivity (*Thomas et al 2017*)
- Higher risk of eating disorders with autism spectrum disorders (*Lock & Pépin 2019*), especially *ADHD*





# Assessment



# Evaluation

- In the assessment of adults sensory processing should also be taken into account (as well as other physical, cognitive and socio-emotional challenges that may have an impact on participation in daily activities and quality of life).
- Measurements that are aimed at adults are more focused on the sensory modulation perspective.

*(Pfeiffer 2020; Champagne & Pfeiffer 2020)*



- Research shows that mental health clients can have various sensory processing difficulties
- Some sensory processing difficulties may lead to mental health problems (especially if not found), or some sensory processing difficulties can be wrongly diagnosed as mental health issues (*see eg. Kranowitz, C. 2016: The out-of-sync child grows up*)
- Including sensory processing point of view in assessment is very important!

**Intervention:**  
SI based therapy/  
ASI (Ayres Sensory  
Integration) therapy

# SI based therapy with adult population

- Intervention is most often implemented in the client's natural environments.
- Adults play an active role in their own therapy process.
- Access to information about one's own situation is emphasized in adults
  - Understanding your own sensory system, needs and reactions (behavior) & identification of activities (that provide right kind of sensory stimuli) that could help performing daily occupations
    - increased motivation for therapy
    - increased self-awareness
    - skills to tell others about one's own situation and thus, for example, to defend one's own rights (changes suitable for the workplace) (If the client doesn't have sufficient skills -> family involvement)

- Utilization of sensory activities (especially tactile, vestibular and proprioceptive) -> should be based on individual needs (assessment)
- Identification of individualized sensory strategies -> personal self-care plans, grounding, self-soothing, mindfulness practice, decreased undesirable or unsafe behaviors etc..
- Utilization of other models in general (eg. PEO)
- Sensory modulation intervention: using senses to change how you feel (sensory modulation rooms, sensory kit, sensory cart, sensory diet, personal safety plans etc)
- Can be group-based
- Avoidance behavior is common: intervention should provide new means to symptom management rather than avoidance – adaptive strategies that support participation and engagement

# ASI -therapy

Recommended when there's in the background especially SI-dysfunctions

## Sensory modulation challenges

- Providing information, resources & strategies
- Modifying environment or activities
- -> Aiming to increase well-being and the ability to participate in necessary and desired daily activities at home, at work and in the community

*(Pfeiffer 2020)*

## Sensory processing motor disorders

- Individual clinic-based therapy is recommended
- Providing information
- Teaching clients to identify the type of sensory input that work toward improving their SI functions
- Utilization of home programs and supportive hobbies
  - Eg. Martial arts, gym training, swimming

## Somatosensory-based dyspraxia

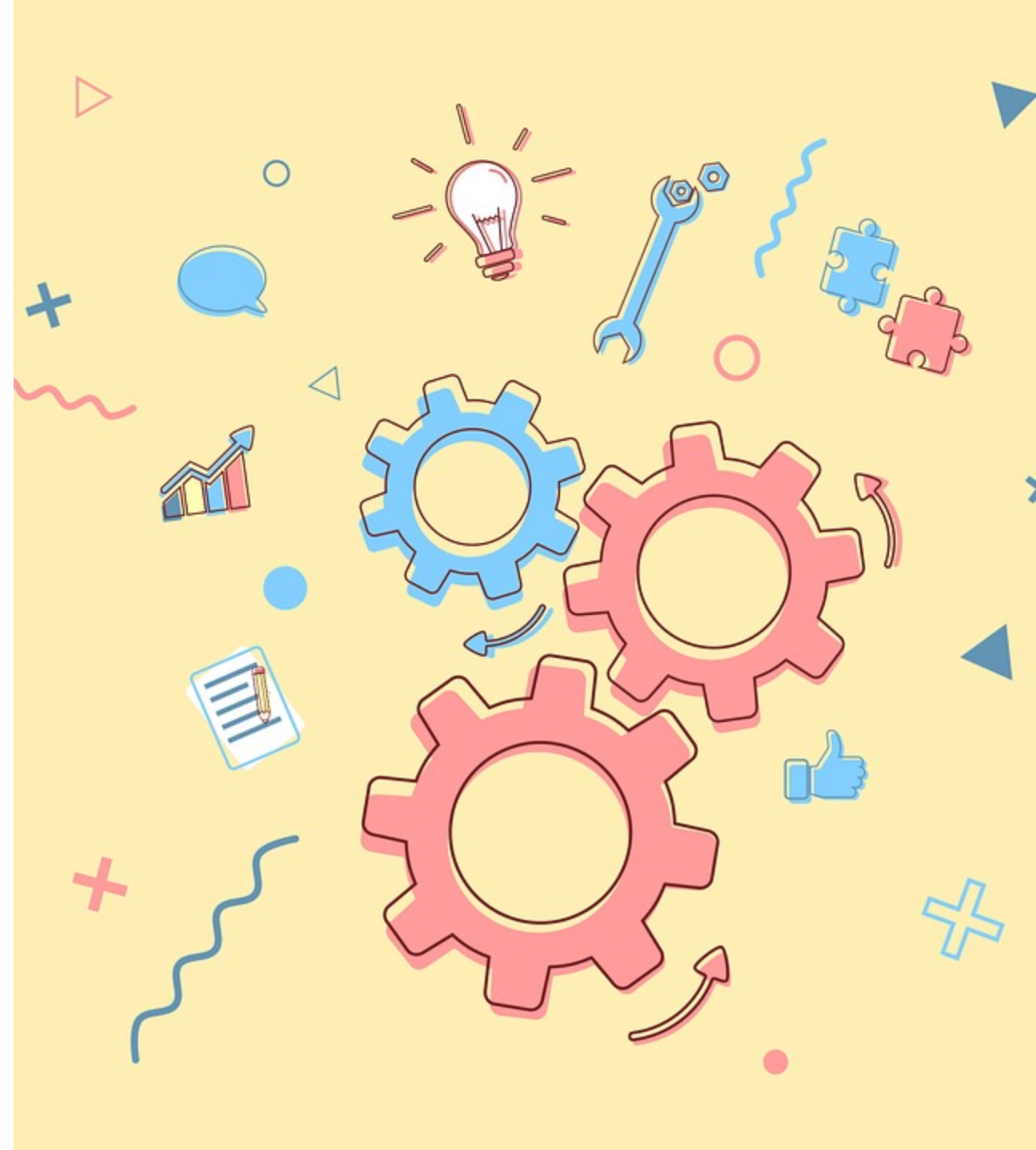
- Utilization of heavy work activities that provide increased somatosensory and proprioceptive input that enhance body awareness
- Practice of problem-solving skills, modeling, and assisting to plan and sequence steps involved in challenging tasks
- -> Utilization of cortical approaches in addition to SI therapy is useful

”

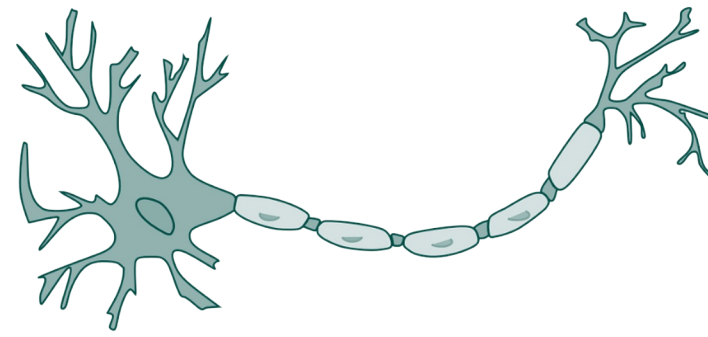
**”Facilitating adaptive responses is key feature of SI intervention for both children and adults, and adaptive responses can be achieved by embedding challenging and novel activities into activity routines, given optimal sensory input or supports.”**

*(Pfeiffer 2020)*

TURKU AMK



# ASI –four assumptions



- **The CNS has neuroplasticity**
  - *Neuroplasticity also affects adults, although it is slower and requires more repetitions compared to children*
- **The brain functions as an integrated whole**
  - *It's good to remember, that eg. a severere / prolonged stress reaction makes it difficult to function at the cortical level*
- **Adaptive interactions are critical to the development of SI**
  - *An important aspect also for adults. Many adult clients may already have poor ways of responding to environment, that should be learned off*
- **Children have an inner drive to develop SI trough participation in sensorimotor activities**
  - *Adults, therefore, have had intrinsic motivation at least at some point in their lives. Some adults may be very passive -> finding motivation for therapy is often the first step in rehabilitation. Access to information can be a good way to restore internal motivation – and why not adding a little bit of play and trying out how your senses can change how you feel..*



# ASI fidelity (ASIFM, Ayres Sensory Integration Fidelity Measure)

(Miller & Parham 2020; Schaaf & Mailloux 2015)

## STRUCTURAL ELEMENTS

- Therapists' Qualifications
  - Few therapists working with adults have sufficient qualifications in Finland
- Safe Environment
  - Suitability of equipment for adults (eg. Size, weight limits)?
- Assessment Report Content (*eg history, current data, evaluation results, goals*)
  - In case of some adults it is not possible to access a comprehensive background information from childhood
  - Less assessment methods compared to children population
- Physical Space for ASI Intervention & Available Equipment
  - Finding suitable tools for adults can be a challenge
- Communication with Parents and Teachers
  - Cooperation with the clients family with the clients permission



1. Therapist ensures physical safety of child
  - An important aspect for adults as well, physical safety may be more challenging in adults (therapist may not support the client as easily)
2. Therapist presents sensory opportunities to the child (especially tactile, vestibular and proprioceptive)
  - Also possible from an adult's perspective, the adult is also more aware of the activities and their purpose
3. Therapist supports sensory modulation for attaining and maintaining a regulated state
  - An important aspect also for adults
4. Therapist challenges postural, ocular, oral, or bilateral motor control
  - Also from the point of adults, it is possible to implement these kinds of sensorimotor activities
5. Therapist challenges praxis and organization of behavior
  - Also successful with adults, the cognitive perspective is strongly involved

6. Therapist collaborates with child in activity choice
  - There is likely to be a little bit more collaboration with adults in terms of choosing activities
7. Therapist tailors the activity to present a just right challenge
  - Basics of occupational therapy also with adults
8. Therapist ensures that activities are successful
  - Also important with adults 😊
9. Therapist supports child's intrinsic motivation to play
  - Playfulness is not ruled out in adult therapy, especially in the case of SI-based therapy
  - *Proyer 2017: As a feature of personality, playfulness has been little studied among adults, but it is still relevant and can affect, eg, social relationships*
10. Therapist establishes a therapeutic alliance with the child
  - Again, very relevant from an adult therapy perspective

# Therapy with MH clients

- SI-based therapy is important part of therapy, if there is evidence of underlying / co-occurring sensory processing dysfunction
- Sensory modulation intervention can be helpful, even if there is no problems with sensory processing



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**Thank you**