

# CASE ONNI

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*Pediatric case  
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# REASON FOR REFERRAL

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- Onni was 6 years and 6 months, and he was about to start school next autumn, when he first came to OT.
- He had been evaluated by a pediatric neurologist and a rehabilitation team in a local public health care unit since he was 5 years of age, due to delay in speech development (verbal dyspraxia). His cognitive development was typical as well as speech understanding.
- Former rehabilitation: Speech and language therapy in a private clinic. There had also been a short period of occupational therapy in a public health care unit.
- Difficulties in motor skills such as cycling and writing.

# PARTICIPATION STRENGTHS AND CHALLENGES

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- Onni was very friendly and nice boy, he had friends at preschool, and he really liked imaginative play. He also liked Legos.
- Independent dressing was difficult for him, especially because of the fasteners such as zippers and buttons. Learning how to tie shoe laces was still too difficult task, and Onni was not motivated to practice.
- Parents were actively supporting Onni to participate in motor play, and there were many play equipments he could have used at home both indoors and outdoors. However, he never spontaneously chose to climb on jungle gym, swing, run or jump.
- If the task was familiar to him, he was not afraid of speed or high places, so he liked sledding for example.
- In preschool Onni had difficulties with tools like scissors or pencil. He often felt failure and tried to avoid these as much as possible.

# ASSESSMENT

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- In order to gather more specific information about the underlying factors, the Sensory Integration and Praxis Test (SIPT) was administered.
- Formal but non-standardized clinical observations of sensory motor performance was conducted.
- Parents and teacher completed the Sensory Processing Measure (SPM).
- An unstructured parent interview.

# SENSORY INTEGRATION AND PRAXIS TEST

- Onni's SIPT scores were significantly low ( $< -1.0$  SD) on all the tactile perception and discrimination tests.
- His ability to remember and replicate the direction and extent of arm movements was in the average range, as well as the duration of his postrotary nystagmus.
- Static and dynamic balance abilities were inadequate.

Category	Test	Standard Score
Tactile Perception	Manual From Perception	-1.33
	Localization of Tactile Stimuli	-1.04
	Finger Identification	-2.04
	Graphesthesia	-1.99
Vestibular and Proprioceptive Processing	Kinesthesia	-0.4
	Standing and Walking Balance	-2.28
	Postrotary Nystagmus	-0.2
Praxis	Postural Praxis	-0.52
	Oral Praxis	-2.1
	Sequencing Praxis	-2.5
	Bilateral Motor Coordination	-1.09
	Praxis on Verbal Command	0.65
Visual Form and Space, Visual-Motor, Visuopraxis	Design Copying	-1.26
	Motor Accuracy	-0.33
	Constructional Praxis	0.45
	Space Visualization	-1.61
	Figure-Ground Perception	0.51

# SENSORY INTEGRATION AND PRAXIS TEST

- Scores were significantly low on three of five praxis tests. Performing positions and movements on verbal command was much easier than reproducing just by model.
- Onni's ability to copy two-dimensional forms was below age expectations, as well as space visualization. Figure-ground perception and constructional ability were his strengths.

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Tactile Perception	Manual From Perception	-1.33
	Localization of Tactile Stimuli	-1.04
	Finger Identification	-2.04
	Graphesthesia	-1.99
Vestibular and Proprioceptive Processing	Kinesthesia	-0.4
	Standing and Walking Balance	-2.28
	Postrotary Nystagmus	-0.2
Praxis	Postural Praxis	-0.82
	Oral Praxis	-2.1
	Sequencing Praxis	-2.5
	Bilateral Motor Coordination	-1.09
	Praxis on Verbal Command	0.65
Visual Form and Space, Visual-Motor, Visuopraxis	Design Copying	-1.26
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# CLINICAL OBSERVATIONS

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- Assuming prone extension and maintaining supine flexion was difficult.
- Sequential finger touching was difficult: he tapped every finger more than once, and needed visual monitoring.
- Anticipating in ball play was difficult as well.
- Timing and sequencing in jumping tasks was difficult.
- No signs of avoidance responses to touch, movement or other sensations were seen.
- In the SI therapy room Onni came up with ideas that were mainly related to his favorite movies. Sensory motor play ideas were nonexistent or something familiar, such as playing floorball.

# SENSORY PROCESSING MEASURE

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- Social participation was Onni's strength.
- Parents reported some difficulties in grading force, planning actions, and tendency to avoiding tasks that require balance. Onni seemed clumsy, and it was difficult for him to imitate demonstrated actions.
- Teacher also mentioned that Onni seemed clumsy, and had difficulties in completing task with multiple steps.



# SENSORY INTEGRATION PATTERNS

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- Difficulties in tactile perception and discrimination, most of the praxis tests, visual motor coordination and balance. Supplemental observations and parents questionnaire also suggested difficulties with generating ideas especially for motor actions. Novel actions!! Clinical observations also indicated poor supine flexion, weak prone extension and difficulty in thumb and finger touching.
- Somatodyspraxia; poor somatosensory and proprioceptive processing. Poor planning on both movements that are anticipatory and feedforward-dependent as well as actions that depend on sensory feedback. (Cermak & May-Benson 2020)

# HYPOTHESES

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- Poor tactile perception affects Onni's ability to use fasteners in dressing, such as buttons and zippers. It also has made it difficult to use scissors or pencil, and therefore it is not very meaningful for him to try to learn how to draw letters or numbers at preschool.
- Difficulties in planning novel motor actions (praxis) has made it very difficult for him to learn new age appropriate skills, meaning that he needs a lot more practice and effort in order to learn how to ride a bike or climb a playground equipments. Therefore he tends to avoid tasks that are not familiar to him.



# GOALS

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- Onni's ability to discriminate tactile sensations will develop in order to improve his ability to use pencil and improve his writing skills
- Onni's ability to plan novel motor actions will improve so that he will be more willing to participate in play e.g. climbing in playground equipments at school yard

# THERAPY SETTING

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- ASI therapy 30x60min
- ASI therapy room is designed to be fun and multisensory environment, which provides multiple opportunities to move and play.
  - For Onni especially providing tactile information, and opportunities to engage in sensory motor play in versatile ways was crucial.
- Therapist's task is to encourage child to actively challenge themselves, and to ensure successful performance.

# IN THE THERAPY

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- Onni enjoyed coming to OT.
- Especially in the beginning of the therapy section he asked for the same equipments that he was already familiar with. Planning new actions or varying familiar actions was difficult for him.

# PROMOTING TACTILE DISCRIMINATION (BUNDY & SZKLUT 2020)

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- Increased tactile discrimination is an important proximal goal of intervention as it is underlying body scheme and motor planning.
- Promoting increased tactile discrimination involves lots of different tactile and proprioceptive sensations
  - Pushing or carrying heavy objects, pulling ropes
  - Movement activities such as jumping, climbing, trapeze
  - Moving in a ball pit, burrowing under textured pillows
  - Finding objects buried in a box of dried beans or macaroni
  - Identifying shapes drawn on the back

# PROMOTING FLEXION (BUNDY & SZKLUT 2020)

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- The ability to assume and maintain flexion against gravity is critical to postural control and has been linked to somatosensory processing and praxis. (Blanche, Reinoso & Blanche Kiefer 2020)
- When promoting tonic flexion, activities in supine position is created, and vestibular input is used to promote neck flexion, from where the demand for flexion is carefully graded.
- Using different swings, and other large therapy equipments such as therapy balls

# PROMOTING IDEATION (BUNDY & SZKLUT 2020)

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- Children develop ideation through active exploration and interaction with objects and the environment.
- Starting with activities that allow the child to generate the idea of what to do.
  - Using cues, for example by placing toys or therapy equipments in a new place or new way
- Paucity of ideas often cause limited or "scripted" always the same ways from stories or television.



# PROMOTING MOTOR PLANNING (BUNDY & SZKLUT 2020)

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- Motor planning is particularly important for new motor tasks.
- Ability to plan actions follow a developmental sequence
  - Tasks where the child and target are both static are the easiest > tasks in which both the child and the target are moving are the most challenging
  - Simple modifications make activities more or less challenging by changing the precision of the action required to be successful.
  - Varying the speed, size or distance of a target or the speed and range of the child's movements to encourage motor planning is present continuously in therapy

# PARTICIPATION STRENGTHS AND CHALLENGES AFTER THERAPY

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- After 30 sessions of therapy, Onni's parents reported that he was participating in motor play more actively, and they had noticed that Onni now had found joy of moving his body. Parents had also noticed improved skills in motor play skills; e.g. he was now able to pump the swing, and was often choosing it as an activity. In addition he was climbing more skillfully (although it still wasn't his favorite thing to do).
- Onni had started his 1st grade in elementary school. In therapy Onni had learned to discriminate different objects in hand without the vision, and this ability had lead improved writing skills at schoolwork. The main issue still was that he was often very tired after school day, and parents needed to help him a lot with the homework.

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I would like to learn how to tie my shoes.

*- Onni 8 years*

# REFERENCES

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- Bundy & Sklutz 2020. The Science of Intervention: Creating Direct Intervention from Theory. In: Bundy & Lane 2020. Sensory Integration. Theory and Practice. F.A. Davis.
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# QUESTIONS AND DISCUSSION

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*Thank you!*



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