

Chris Chapparo, 2014

SENSORY PROCESSING AND AUTISM

Do any of these situations sound familiar?

- Brian covers his ears or talks loudly when children are singing
- Jane rolls on the floor when others are sitting during reading
- Jacob refuses to touch play dough, sand or paint and holds his brush at the very end
- Bill climbs on top of tables and chairs and jumps off
- Cassandra constantly falls down and skins her knees
- Hassan refuses to play on outdoor playground equipment
- Toby chews his fingers and hands

- All these children may be showing signs of atypical **sensory processing that interferes with everyday life**
- What can be done to enable them to learn and function effectively?

THIS PRESENTATION: QUESTIONS

- **WHAT IS SENSORY PROCESSING**
- **HOW DOES IT WORK: WHAT DOES IT DO**
- **WHAT SENSORY PROCESSING ISSUES MIGHT EXIST FOR CHILDREN WITH AUTISM**
- **WHAT CAN BE DONE TO ADDRESS DIFFICULTIES: EVIDENCE OF SUCCESS**

What is Sensory Processing?

Sensory processing is the ability to

- **gather**
- **understand,**
- **organize** and
- **use** the information that comes to us from our senses. (Hearing, Seeing, Touching, Taste, Smell, Movement,)

PURPOSE

Children learn about their **environment** through integrated sensory systems

- Auditory – hearing
- Visual – vision
- Oral / Gustatory – touch and taste in and around mouth
- Olfactory - smell

Children learn about their **bodies** through integrated sensory systems

- Tactile - touch
- Internal monitoring systems
 - Vestibular – movement and balance
 - Proprioception and Kinesthesia – body position

HOW DOES SENSORY PROCESSING CONTRIBUTE TO EVERYDAY EXPERIENCE?

- WE LIVE IN A SENSORY WORLD. WE ARE ALL PART OF A SOCIAL 'TRIBE' WHICH HAS ITS OWN SENSORY ELEMENTS
- BEING HUMAN IS EMBEDDED IN SENSORY EVENTS
- SENSATION IS THE **COMMON LANGUAGE** THROUGH WHICH WE SHARE THE EXPERIENCE OF BEING HUMAN
- A COMMON GROUND FOR UNDERSTANDING HOW WE PERCEIVE THE WORLD AROUND US



HOW DOES SENSORY PROCESSING CONTRIBUTE TO EVERYDAY EXPERIENCE?



- AT THE SAME TIME:
- EVERYONE CHARACTERISES SENSORY EXPERIENCE FROM A **DIFFERENT PERSPECTIVE**
- PEOPLE RESPOND **DIFFERENTLY TO THE SAME SENSORY EVENT**
- WE ALL HAVE **DIFFERENT SENSORY NEEDS** AND PREFERENCES

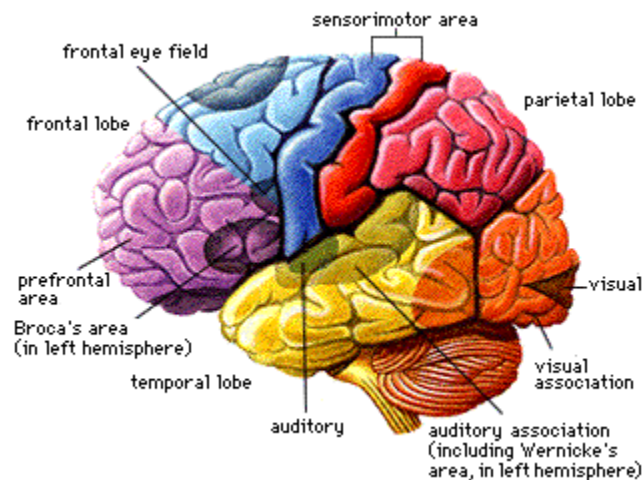
HOW DOES SENSORY PROCESSING CONTRIBUTE TO EVERYDAY EXPERIENCE?

- SENSATION IS INTIMATE AND **PERSONAL**
- OUR RESPONSES TO SENSATION DEFINE OUR **INDIVIDUALITY**
- CONTRIBUTE TO OUR PARTICULAR **TEMPERAMENT AND SELF-EXPRESSION**



HOW DOES IT WORK?

- **SENSORY PROCESSING REFLECTS CENTRAL NERVOUS SYSTEM ACTIVITY**

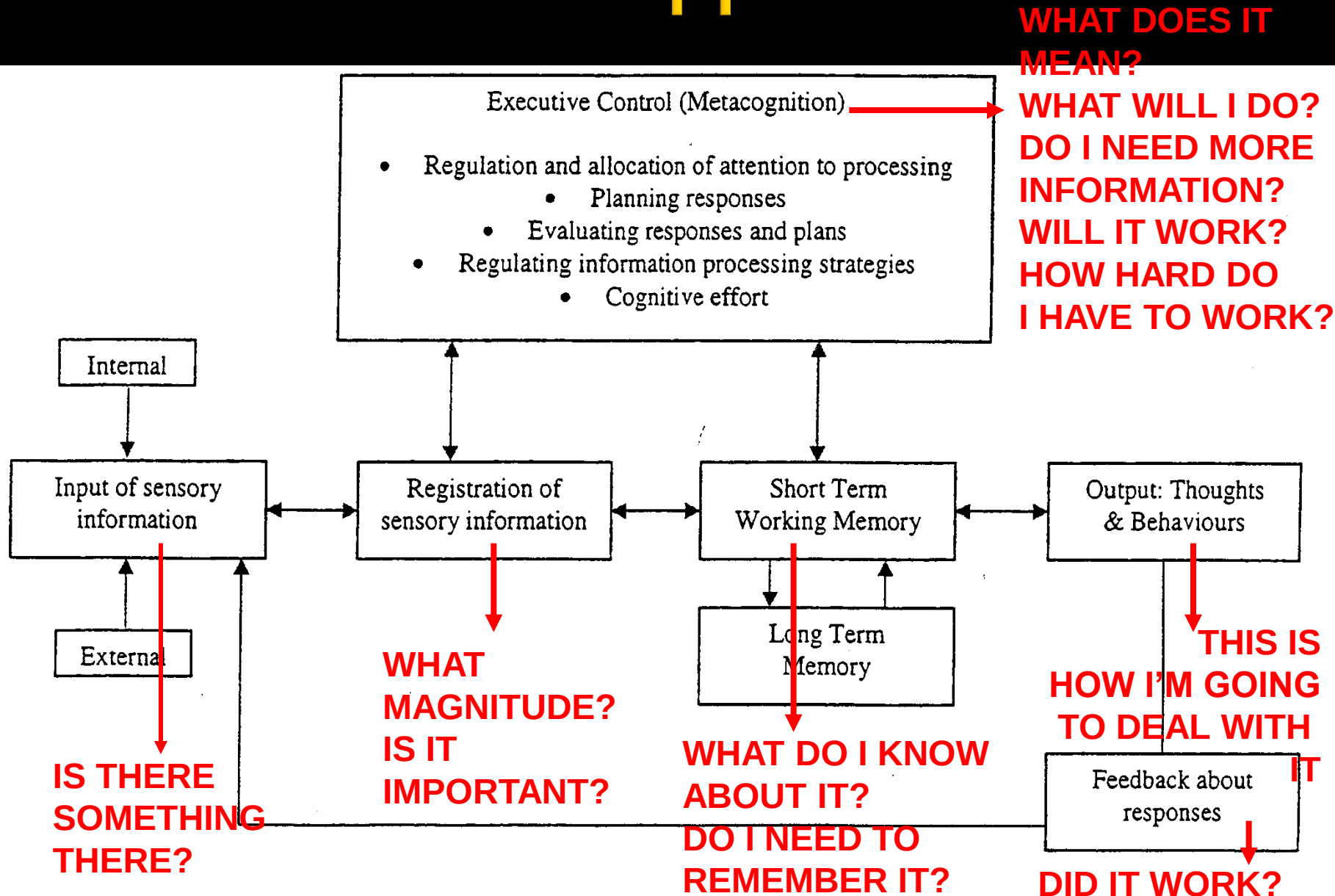


- **MAKES SENSORY JUDGEMENTS ABOUT IMPORTANCE OF INPUT**

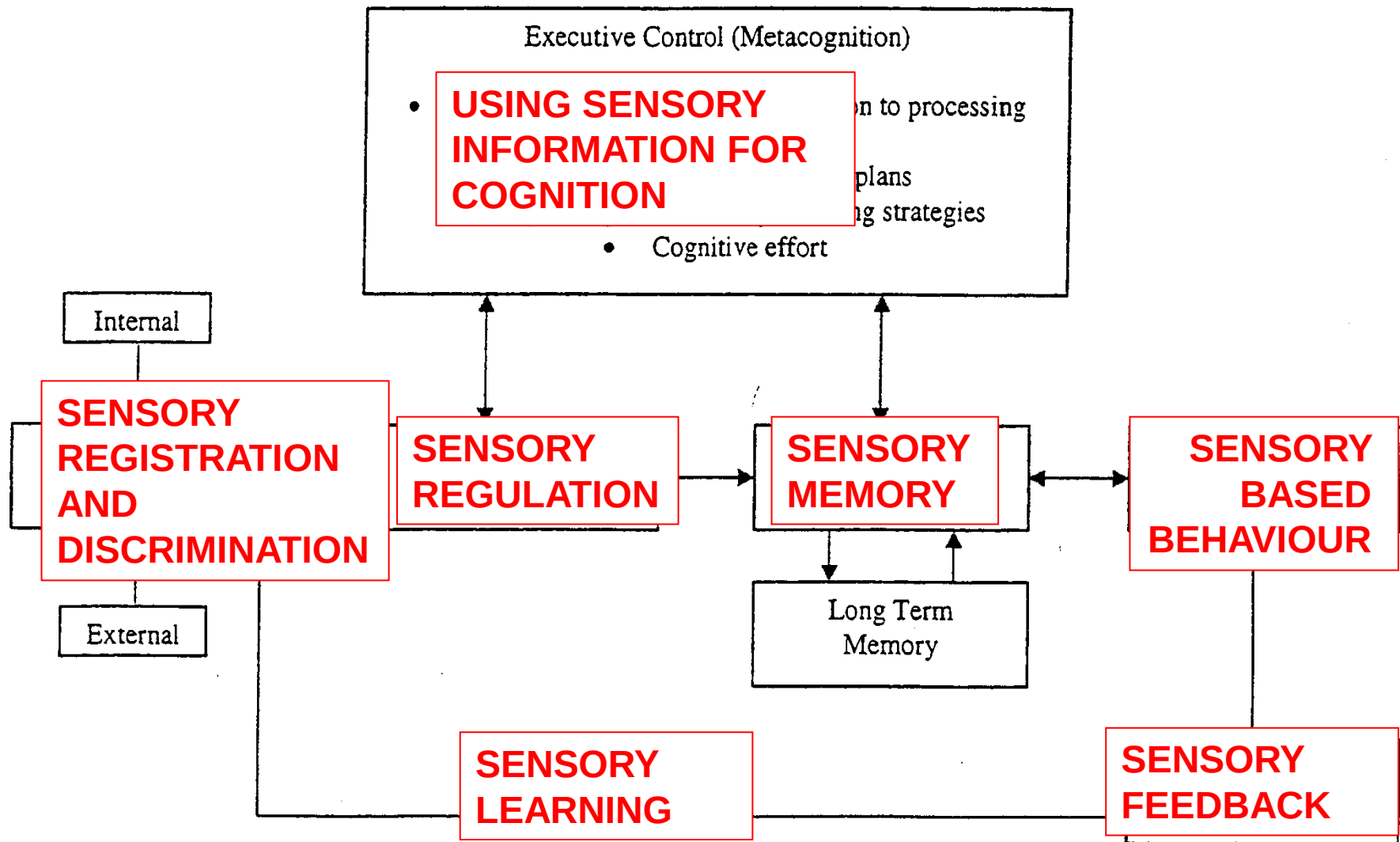


- **CNS CREATES A RESPONSE BASED ON JUDGEMENT**

How does this happen?



How does this happen?



RANGE OF RESPONSES TO SENSORY INPUT

NOTHING



- INPUT IS DAMPENED DOWN
- 'INHIBITED'



'FINE TUNED'
to suit the task



JUSTIN – Year 2

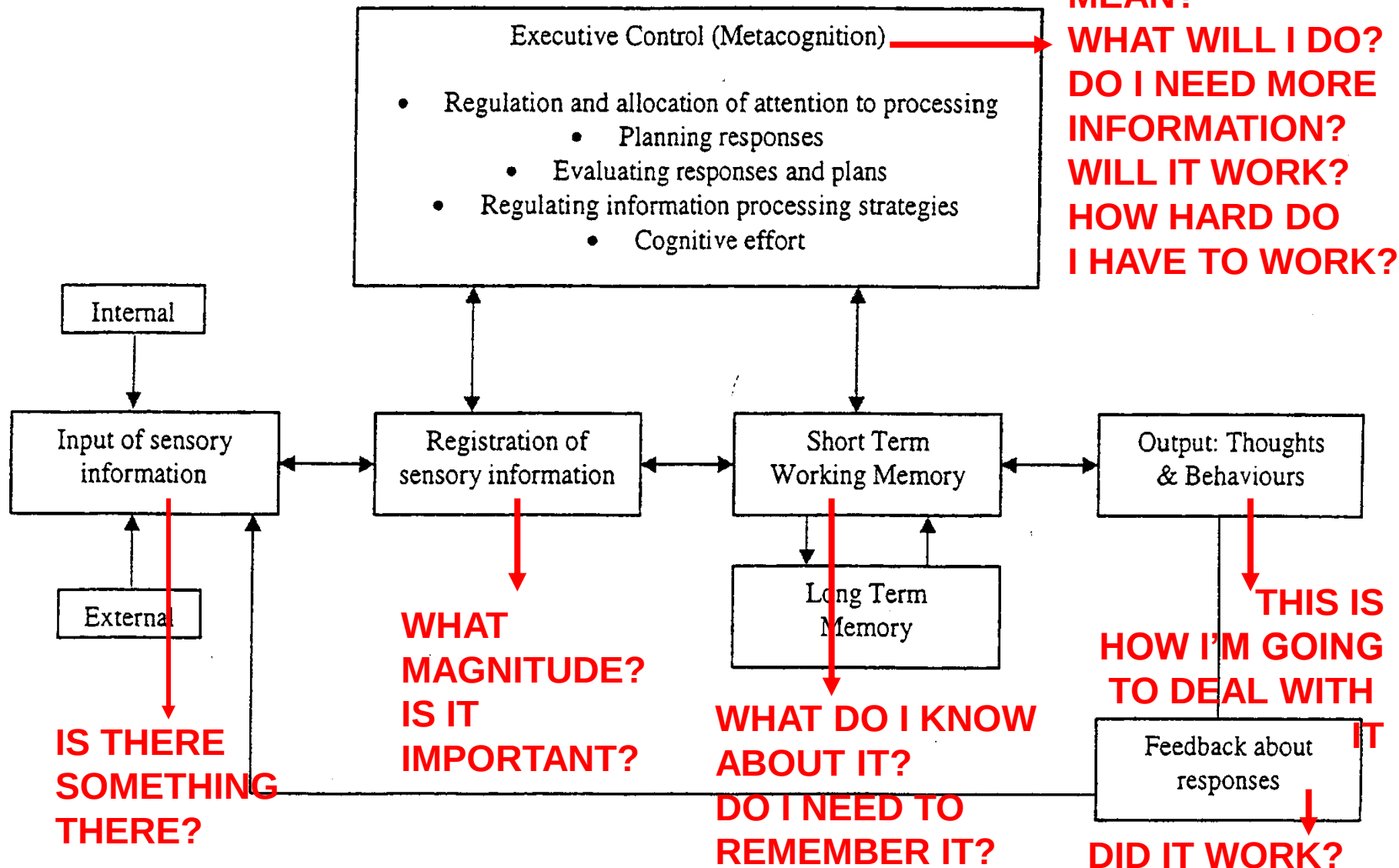
Justin can see the smallest pieces of fluff on the carpet. This distracts his attention from what he is supposed to do – complete maths worksheet.

He hates lights and the fluorescent lights in the classroom can give him a headache. He often fidgets and squirms.

He can hear the teacher talking in the next classroom. He hears Robert dropping his ruler. He hears Peter moving his chair.

Justin's teacher is constantly giving him additional individual verbal prompts to stay focussed.

How is Justin processing sensory information



Every bit of sensory
input is processed in
the brain relative to
two uses

■ **PROTECTION**

- Survival
- Stimulates arousal/ anxiety
- Highly motivating
- Prefenced in CNS
- Environment oriented
- Defensive, automatic, stereotypic behaviours

■ **DISCRIMINATION AND MAPPING**

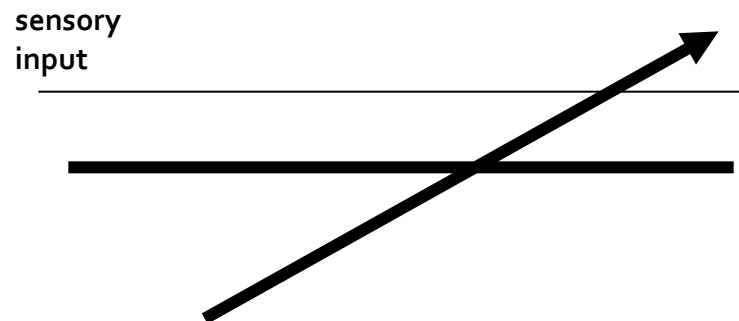
- Planning
 - Organisation
- Sequenced, flexible behaviour
 - Effort
 - 'fit'

← **BALANCE** →

SENSORY RESPONSIVITY TO EVERYDAY EVENTS DETERMINES SENSORY BEHAVIOURS : HOW? THE SENSORY THRESHOLD (Dunn)

- The point at which a person **detects and responds** to sensory information
- **Below** this threshold, the person is **unaware of sensory input**
- Not a stationary point - **dynamic and variable**

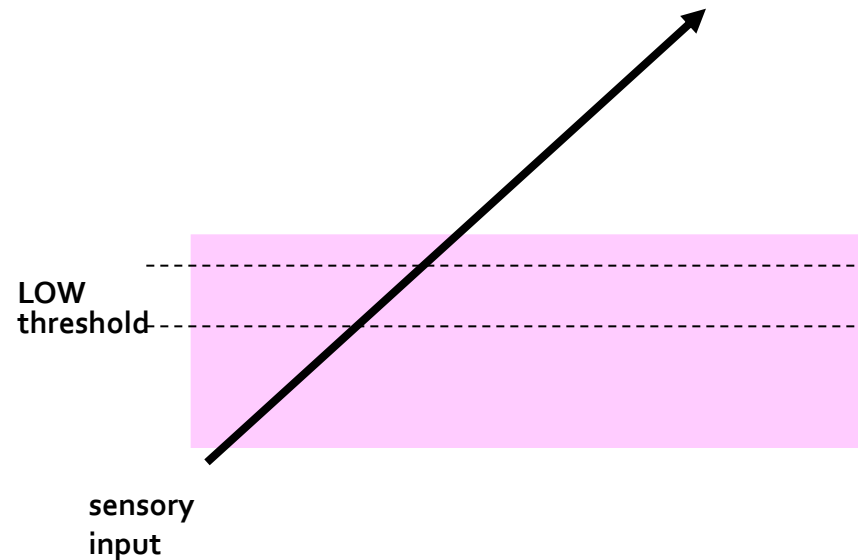
Threshold



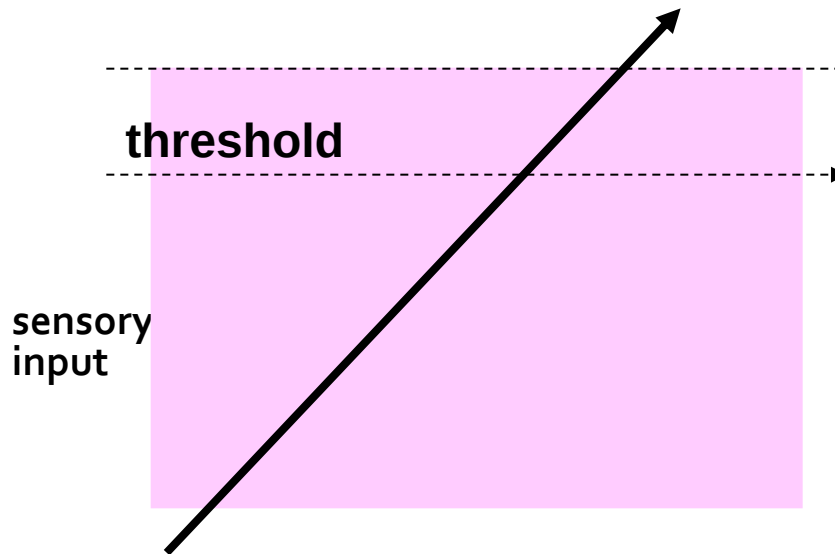
- Affected by:
 - **Accumulation of sensation** over time
 - The sensory **system** being used
 - **Intensity**
 - **Location** of input
 - **ANXIETY**

SENSORY HYPERRESPONSIVITY

- **HYPERRESPONSIVITY** occurs when:
- Sensory input **EXCEEDS** a person's ability to cope
- **RESULTS IN BEHAVIOURAL DISORGANISATION**
- Child with low sensory threshold will become disorganised more readily than child with high sensory threshold

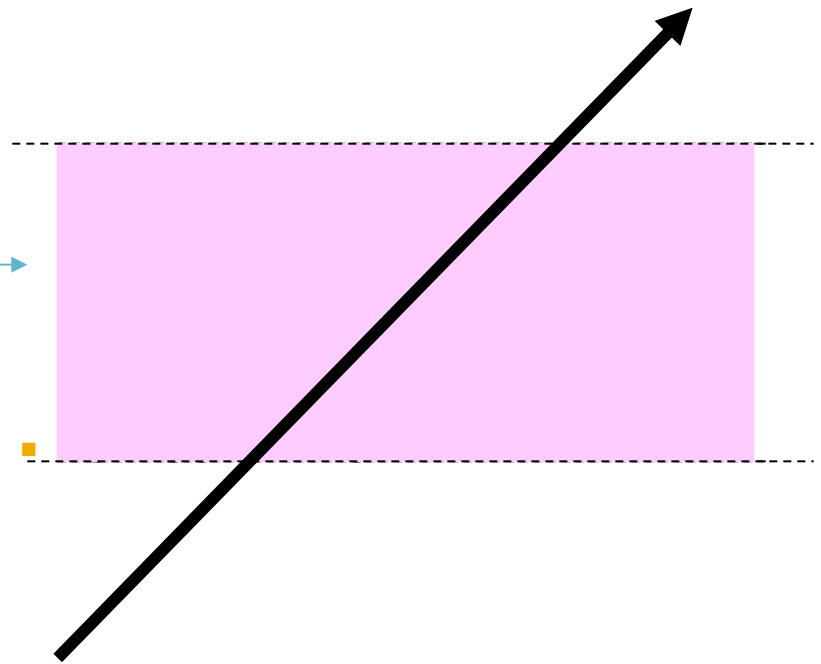


SENSORY HYPORESPONSIVITY

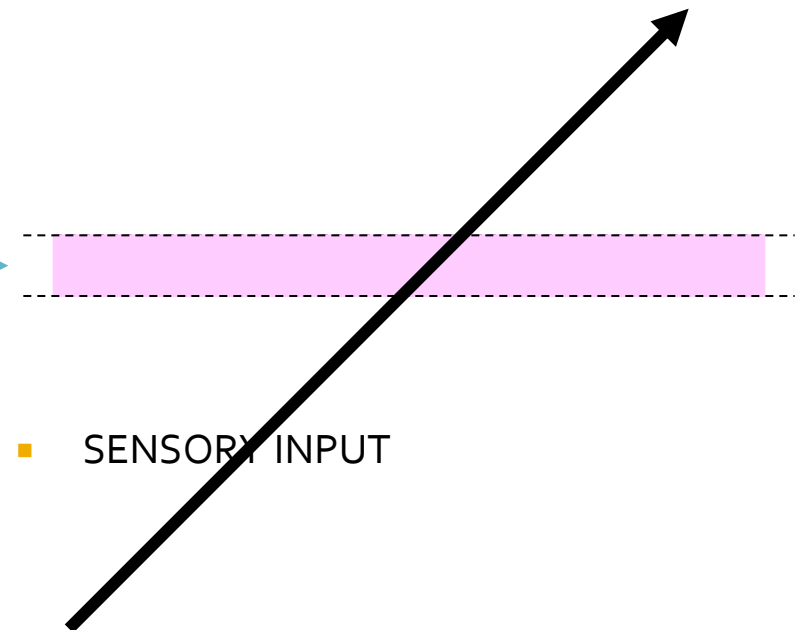


- **HYPORESPONSIVITY** occurs when:
- greater than normal levels of input required for registration

- **Responsivity** is a **RANGE** within which sensory input is tolerated and used
- The **wider the range**, the more likely it is that the child maintains **regulated and adaptive behaviour**

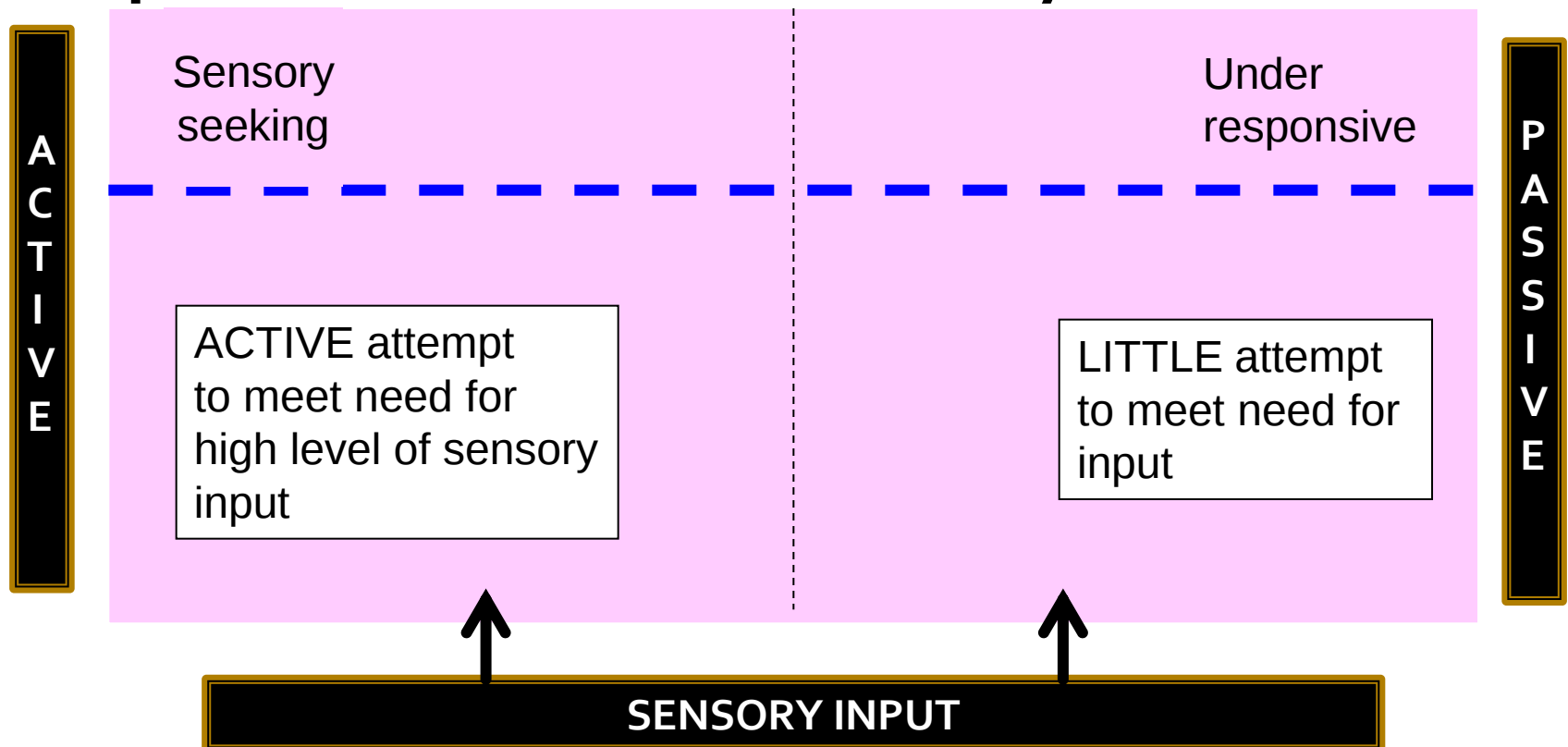


- If the range is **NARROW**
- The more likely it is that the child will have a limited range of behaviours or will only be able to perform in a limited number of sensory environments



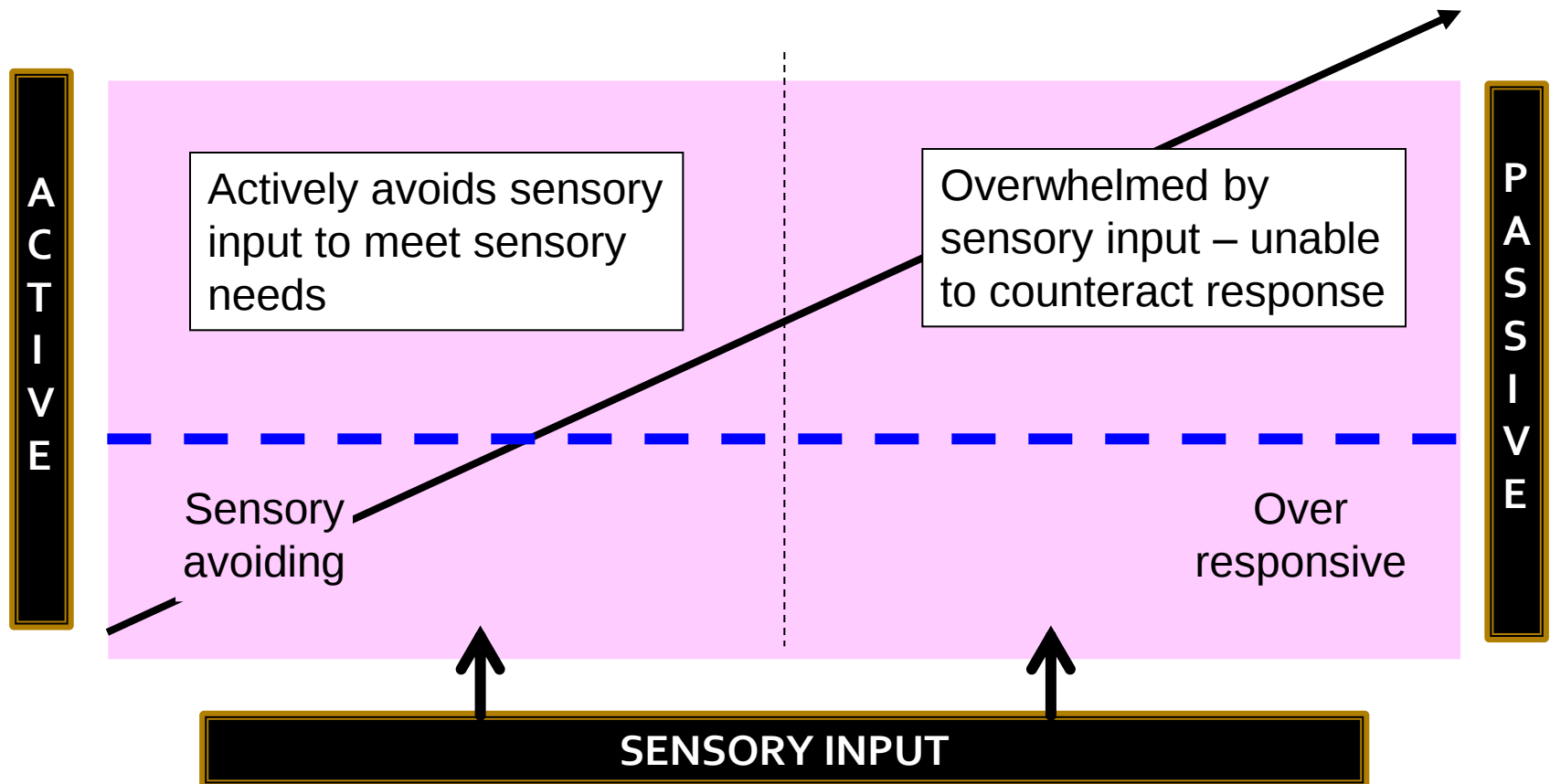
HOW DOES THE THRESHOLD PRINCIPLE EXPLAIN SENSORY BEHAVIOURS?

- If the **threshold** is HIGH – lots of sensory input needed to meet sensory needs



HOW DOES THE THRESHOLD PRINCIPLE EXPLAIN SENSORY BEHAVIOURS?

- If the **threshold** is LOW

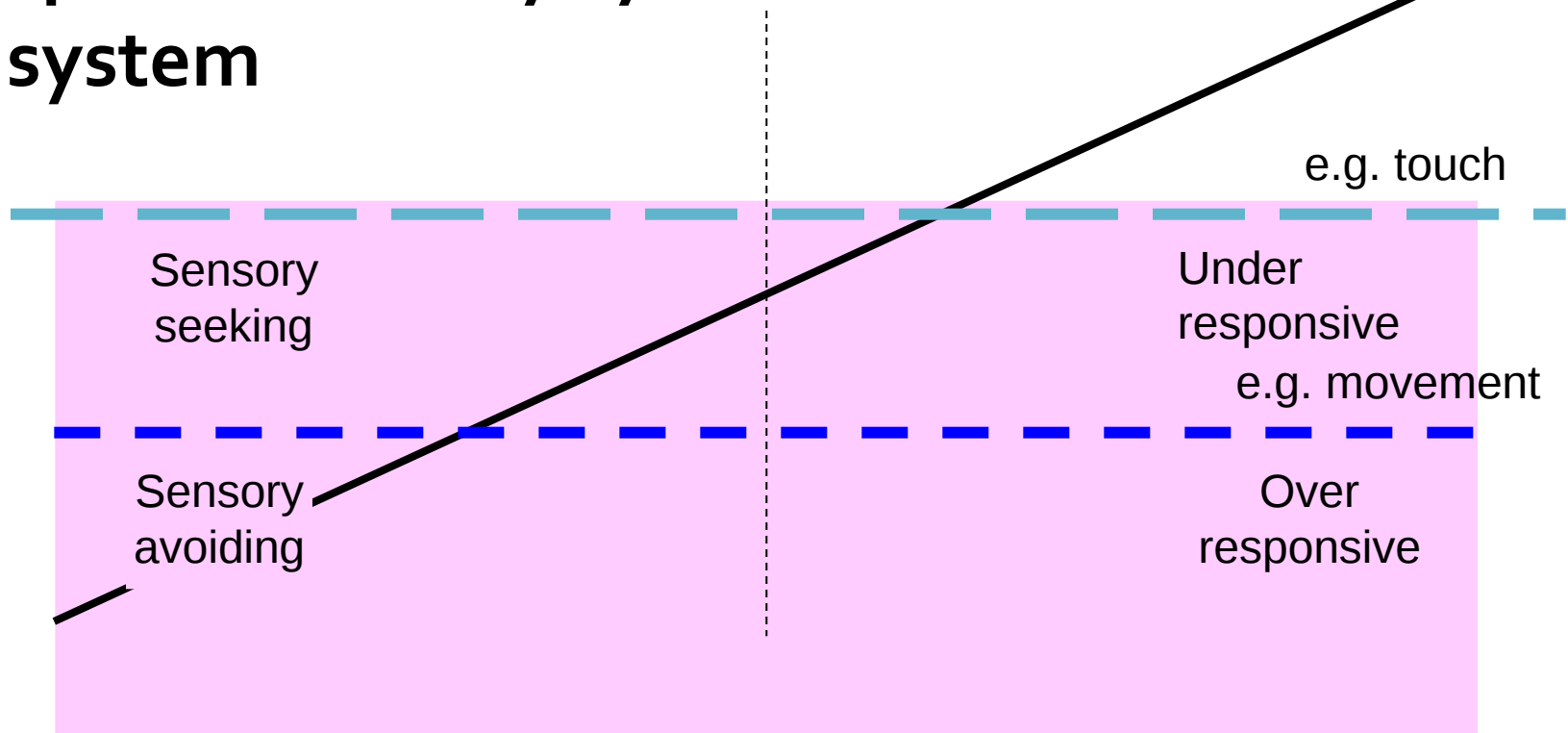


HIGH THRESHOLD REACTIONS

- Reactions to some sensory information are **TOO STRONG** and linked to negative behaviour, anxiety or **extreme emotions**

RESPONSES CAN BE CONSOLIDATED OR VARIABLE

- **Thresholds can be LOW and HIGH in specific sensory systems AND within one system**



- Reactions may be
**NOT STRONG
ENOUGH -**
inconsistent and
fragmented
behaviour

WHAT IS SENSORY PROCESSING AND HOW DOES IT WORK?

- **SUMMARY SO FAR:**
- **Sensory processing is:**
 - Embedded in everything we do
 - Complex with multiple systems wired to function independently and together
 - Closely linked to behaviour and temperament
 - Expressed differently in everyone
 - ?? Typical??

WHAT IS A DISORDER OF SENSORY PROCESSING?

- When sensory events are processed in such a way that it **affects participation** in childhood learning experiences
- Long term and persistent: **not temporary**

WHAT SENSORY PROCESSING ISSUES MIGHT EXIST FOR CHILDREN WITH AUTISM

- Dimensions of sensory processing:

- Registration

- Regulation

- Discrimination

- Cognition

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graph LR; A[Registration] --> D[Using sensory information purposefully]; B[Regulation] --> D; C[Discrimination] --> D; E[Cognition] --> D;
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Using sensory
information
purposefully

Sensory registration and regulation in autism

SENSORY REGULATION

- What is it?
- ***To regulate means to **adjust** or **adapt** to a certain **proportion**: to **modulate**, to temper***
- ***Sensory **regulation** occurs on **neurophysiological** and **behavioural** levels***

Evidence of the impact of sensory dysregulation on behaviour of children with autism

- Meta- analysis of 14 studies: ASD
- Difficulties with sensory regulation common in persons with autism
- Different types
- Significant difference between ASD and typical peers in presence and frequency of sensory symptoms

- Underresponsivity
 - Over-responsivity
 - Sensation seeking
- 
- Moderators that reduced the variability in findings were:
 - Age
 - Severity of autism
 - Sensory differences highest for children 6-9 years

Ben-Sasson, Hen, Fluss, Cermak, Engel-Yeger & Gal, (2009). A meta-analysis of sensory modulation symptoms in individuals with Autism Spectrum Disorders. *Journal Autism and Developmental Disorders*, 39, 1-11.

Evidence of the impact of sensory dysregulation on behaviour of children with autism

70 children and adolescents with ASD

- Significant association between amount of repetitive behaviours and sensory processing
- Perhaps there are sensory processing 'subgroups' based on severity of repetitive behaviours

Evidence of the impact of sensory dysregulation on behaviour of children with autism

In people with autism:

- When high rate of repetitive behaviour present – most likely to have atypical sensory processing score that is homogeneous
- When low rate of repetitive behaviour present – more heterogeneous score and minimal abnormal sensory responses

Gabriels, Agnew, Miller, Gralla, et al. (2008). Is there a relationship between restricted, repetitive, stereotyped behaviors and interests and abnormal sensory response in children with autism spectrum disorders? *Research in Autism Spectrum Disorders*, 2, 660-670.

Evidence of the impact of sensory dysregulation on behaviour of children with autism

Sensory processing different in persons with autism in comparison to community controls (n=103: 3-43 yr)

- **Older persons with autism were closer to the community controls but difference remained throughout life**
- **Less frequent sensory seeking and defensive reactions**
- **A link between sensory processing problems and difficulties in managing daily life**

Kern, J., Garver, R., et al (2007). Examining sensory quadrants in autism. *Research in Autism Spectrum Disorders*, 2, 185-193.

Evidence of the impact of sensory dysregulation on behaviour of children with autism

- **Sensory seeking and touch processing** correlated with performance of **gross motor skills in children 3-4 yrs with ASD**.
- Suggest **atypical somatosensory responses** impacting on **motor development**
- **Sensory avoiding** linked to **fine motor skills in daily living skill performance**

SENSORY OVER-RESPONSIVITY AND AUTISM

- Atypical fear responses to sensory inputs
- Two consequences:
 - 1. Sympathetic nervous system responses (autonomic responses) = **fear responses** found in children with autism after sensory challenge
 - 2. Parasympathetic nervous system responses = **difficulty recovering** from the challenge

SENSORY OVER-RESPONSIVITY AND AUTISM

- **Decreased, or disorganised sympathetic/parasympathetic CNS activity has been associated with a narrow range of behavioural adaptation to changing sensory conditions, and is a predictor of stress, vulnerability, and risk status**
- **ANXIETY + SENSORY OVER-RESPONSIVITY**

Primary sensory behaviours: Secondary behaviours: Coping strategies

- **SECONDARY BEHAVIOURS**

- Behaviours that are not direct defensive response to sensations
- May be related to sensory defensiveness
- Difficulties with **STATE REGULATION**
 - Anxiety
 - Stress
 - Distractibility
 - Sleep difficulties

- **PHYSICAL DISRUPTIONS** (headaches, postural tension)
- **SOCIAL/EMOTIONAL DIFFICULTIES**
 - Social avoidance
 - Aggression
 - Emotional fragility
 - 'meltdowns'

SO WHAT?

- Any informed care recognises that young people with ASD may have a history of sensory trauma and to ignore sensory hypersensitivities can exacerbate the trauma
- Hyper-sensitivity + inability to understand the nature and purpose of sensory inputs can trigger fear and negative reactions in young people with ASD (and Intellectual Disability)

What is the role of sensory processing when there is anxiety and hyper-sensitivity?

- Anxiety (high arousal)
- Sensory Hyper-responsivity
- Sensory Seeking

**Closely
connected in
autism**

ANXIETY AND SENSORY HYPER-RESPONSIVITY

- Anxiety stems from an inability to self-calm high levels of arousal
- It is among the most common psychopathologies in childhood
- Approximately 42-55% of youth with ASD meet criteria for an anxiety disorder
- As many as 62% of youth with mood or anxiety disorders show elevated autism spectrum traits
- (Cartwright-Hatton, McNicol & Doubleday, 2006).

ANXIETY AND SENSORY HYPER-RESPONSIVITY

- Children with autism may show a different pattern of anxiety than anxious youth without ASD. Children with ASD meet diagnostic criteria for specific phobias at a substantially higher rate than the 3.5-7.9% prevalence reported in community samples
- Children with ASD have been found to have more parent-reported physical injury fears compared to typically developing anxious youth, a pattern that may be explained by a heightened sensitivity to noise and touch among youth with ASD

LINK BETWEEN SENSORY OVER-RESPONSIVITY AND ANXIETY CAN HAPPEN THREE WAYS

- Symptoms of anxiety lead to over-reaction to sensory stimuli
- Sensory over-responsivity produces anxiety
- This over-reaction is maintained and becomes learned behaviour through repetition
- Either specific avoidance or generalised anxiety through repeated exposure to sensory situation

ROGER – Year 3

Roger is at the bus line. The kids have a 20 minute wait, so most of the boys play handball. Reg was anxious about missing the bus.

He walked off and started kicking all the kid's bags that were lined up. He was asked to stop and he refused.

He then pushed a Kindergarten girl in the back and shoved hard enough for her to fall over.

He then started to pick up rocks and throw them at parents and young siblings.

The teachers had to quickly escort parents and students out the gate. The teachers tried to restrain Roger but he kicked and punched them.

What sensory system is he using to deal with his anxiety?

- **Many children with autism show deficits in both sensory processing and affective (anxiety) patterns**
- **Addressing both aspects simultaneously (sensory and anxiety/emotion) without consideration of causation can benefit everyday adaptation and reduce stress**

SENSORY 'INTERVENTIONS'

ASSESSMENT OF SUITABILITY FOR SENSORY BASED INTERVENTIONS

- **CRITERIA:**
- Occupational need (REASONS?)
- Evidence of significant and persistent SOR
- Suitable family/school context resource
- Therapist knowledge and skill
- Sufficient service delivery resources for follow up and support

SENSORY THINGS TO OBSERVE

- **Type and style of intervention is dependent upon goal, resources and context**
- **Use M.A.T.C.H. system to determine**
 - **What needs to be learned**
 - **Who needs to do the learning**

Modify Task	Does the task need to be changed to suit the child's sensory processing capacity?
Alter Expectations	Do the teacher/parent/therapist's expectations need to change?
Teach Strategies	What sensory processing strategies/experiences might be provided to the child to help his/her performance?
Change Environment	Does the sensory environment need to be changed to suit the child's processing needs?
Help by Understanding	What information should be provided to teachers/ parents/ children to help them understand the need for a change in the way things are done?

HOW? STRATEGY ONE

- **Direct** 'sensory' intervention (OT)
 - Work on **widening and resetting the threshold** range for sensitivity and discrimination
 - Work on **establishing recovering strategies**

Modify Task	
Alter Expectations	
Teach Strategies	What sensory processing strategies/experiences might you provide the child to help his behavioural accommodation?
Change Environment	
Help by Understanding	

INTERVENTION FOCUS AND TYPE: EVIDENCE

Ayres Sensory Integration®:

- Most researched area of clinical practice for sensory processing disorders
- Controversy and disunity
- Studies in 1970's and 80's suggested positive impact vs later studies
- Recent RCT study indicates effects (Schaaf et al 2013)
- Evidence evolving to support its use with high functioning children with autism

HOW?: STRATEGY TWO

- Use of Sensory Activity Schedule in home and school contexts
 - Carefully selected sensory input is integrated into daily routines to regulate behaviour
 - The timing, intensity and duration of sensory based activity is critical
 - Individually constructed for each child's situation

Modify Task	How would you change the task to suit the child's sensory processing capacity?
Alter Expectations	How might the teacher/therapist's expectations change?
Teach Strategies	
Change Environment	
Help by Understanding	What education should you provide to teachers and parents to help them understand BOTH the behaviour and need for a change in their approach?

What is a sensory activity schedule?

- An activity program that is developed to meet the sensory needs of an individual child with sensory processing difficulties
- **The purpose is to help the child function better in a sensory world**
- The sensory diet includes touch, vestibular, proprioceptive, and visual input that the child seeks in a structured way so that behaviour remains purposeful
- **A sensory activity schedule also incorporates activities to calm the child when they are unable to calm themselves**

HOW? STARTS WITH ASSESSMENT OF HOW CHILD USES SENSORY BEHAVIOURS: "ABC" + sensory

What is the behaviour

- Define the behaviour(s)
- Do they stem from the same cause
- Do the behaviours occur in a predictable pattern

Is change needed ?

- Harmful
 - Destructive
 - Disruptive
- Interferes with learning
- Socially undesirable

Analysing behaviours: Identifying antecedent situations

ENVIRONMENT

- Size of room
- Structured/Unstructured
- Adult/child ratio
- Environment
- Time of day

■ TASK

- No task/in task
- Characteristics of task
 - What task preceded behaviour

Analysing behaviours: Identifying antecedent situations

■ SPECIAL EVENTS?

- Recent illness
- Lack of sleep
- Emotional episode
- Other

■ WARNING SIGNS ?

- Restlessness
- Eye aversion
- Distractibility
 - Frustration
 - Stop activity
 - Raised voice
- Stereotypic behaviour

Primary cause of the behaviour

- Is the person trying to **OBTAIN** something?
- Is the person trying to **AVOID** something?

Is the person trying to OBTAIN something?

EXTERNAL

- Attention
- Object
- Activity

Is communication
acceptable/
unacceptable?

INTERNAL

- Sensory
 - Vision
 - Touch
 - Auditory
- Proprioception
- Vestibular

Productive/non-productive
Effective
Acceptable?

Is the person trying to AVOID something?

■ EXTERNAL?

- Attention
- People
- Situations
- Transitions
- Tasks
- Objects

■ TASK ANALYSIS?

- Task too difficult
 - Not challenging
- Involves transitions
 - Dislikes
- Self-confidence
 - Fear
- Sensory
 - No meaning

Is the person trying to AVOID something?

INTERNAL/SENSORY

- Overstimulated
- Arousal
- Specific type of sensory input

INTERNAL/SYSTEMIC

- Pain
- Hunger
- Itching/irritation
- Illness
- Hot/tired

If sensory links to behaviours are found:

- Determine if you need to:
 - **Stop** the behaviour
 - **Limit** the behaviour
 - **Alter** the behaviour
 - **Let it fade** (extinguish) with sensory based program

If sensory links to behaviours are found:

- Determine what is the sensory stimulation provided from the behaviour:
 - Intensity
 - Duration
 - Frequency

If sensory links to behaviours are found:

- What need is met:

- Obtain something
- Avoid or terminate something
- Communicate something

- Sensory behaviour to:

- Calm self
- Arouse self
- Organise self

- From this information an activity schedule is planned
- Specific
- Timetabled
- Behaviour based
- Individual
- Age appropriate
- Contextually relevant

ACTIVITY SCHEDULE IS PLANNED AND SPECIFIC

BEHAVIOUR

WHAT IT LOOKS
LIKE

ALTERNATIVE ACTIVITY

BEHAVIOUR

PROPRIOCEPTIVE /
VESTIBULAR SEEKING

WHAT IT LOOKS LIKE

- PRESSING BODY
AGAINST THINGS
- HITTING
- RUNNING
- TENSING
MUSCLES AND
JOINTS
- UNUSUAL
POSTURES
- THROWING
- BREATHING
- BLOWING

ALTERNATIVE

- BLANKET WRAPS
- SQUEEZE TOYS
- TRAMPOLINE
- EXERCISE
PROGRAM

HOW?

- **Work on one situation at a time**
- **Use sensory input that is calming**
- **Expected outcome (what is measured)**
 - **React to sensation in a way that leads to function**
 - **Focus on relevant sensory input (INDIVIDUAL)**
 - **Move/touch without fear, aversive reactions to sensations that are part of life (REDUCE ANXIETY)**
 - **Within the context of RELEVANT activity**

What can you do for movement seekers?

- Tire swing
- Balancing feats
- Riding toys
- Hula hoops
- Running and jumping
- Trampoline (mini)
- Rolling downhill
- Movement games (ring around the rosie – Hokey Pokey)

What can you do for proprioceptive seekers/ underresponders?

- Examples?

Weighted 'things' PRECAUTIONS

ORAL PROPRIOCEPTIVE

EVIDENCE

- **Sensory Activity Schedule and Environmental Adjustments:**
- Activities and environmental adjustments designed to complement the child's sensory needs.
- Highly individualised
- Emerging support

SENSORY ACTIVITY SCHEDULE EVIDENCE FOR HOME AND SCHOOL USE

- **HOME:**
- Randomised controlled study (Chapparo & Mora, 2011)

- To determine whether a **Sensory Protocol**, when used by parents/carers under the guidance of trained occupational therapists improves the **functional performance** and **behavioural responses** for children with severe sensory defensiveness.

Methodology

- Randomised controlled study
- 30 Children with ID + ASD and severe sensory defensiveness and nominated carers or parents were randomly allocated to:
- **experimental intervention** (Group 1 **Sensory Intervention**)
- **control intervention** (Group 2 **Behavioural Intervention**)
- Used GOAL ATTAINMENT SCALES generated by parents and DEVELOPMENTAL BEHAVIOURAL CHECKLIST as outcome measures

Example Sensory Diet

Time	Key events in the day	DPPT	Other sensory diet activities	Comments
7.00	Wake up	✓	Jump and crash on bed Massage on hands	<i>Tim woke in angry mood</i>
8.00	Breakfast		Drink with crazy straw Rock on big ball	
9:00			Go for walk Massage on hands	
10.30	Morning tea	✓	Eat roll-up	
12.30pm	Lunch	✓	Have drink using crazy straw	
2.00			Jump on trampoline 15 minutes	<i>Calm</i>
3.30	Outdoor play	✓	Runs with sister, goes in cubby house	<i>Found Tim enjoys making cubby houses</i>
4.30	Afternoon tea		Hand fidget toy Juice with straw	
5.30		✓	Sit on rocking chair to watch television	
6.30pm	Dinner		Chewy foods in dinner Weighted pillow on lap	
	Bath		Warm bath with firm sponge	
8.00	Bedtime	✓	Rock on parent's lap and read story. Weighted blanket.	

Sensory diet activities and DPPT

Bouncing up & down on ball



BEAR HUGS



brief heavy
chores 'n push,
pull, lift



mini tramp
or trampoline



air cushion



PILLOW SQUASHING



biking



gentle helper
squishes



pressure
brushing



'n joint
compression



- Both interventions effective in achieving functional goals
- The sensory intervention is more effective than behavioural intervention for **improving the behavioural responses at home** of children with Intellectual Disability, Sensory Defensiveness and Behaviour Support Needs

- Parents perceived that the sensory intervention has a greater impact on daily life of children, is **easier to implement** than behavioural intervention

QUALITIES OF SENSORY DIETS THAT WORKED

Hierarchy of most utilized senses in the sensory diets

<i>Sense</i>	<i>Occasions of use</i>
Proprioception	30
Vestibular	12
Tactile	5
Oral	2
Visual	2
Auditory	1

The above list indicates that proprioceptive based activities were used the most, followed by vestibular based activities.

Sensory based activities used by parents in the study

Proprioception

Being squashed by ball
Squashing with pillow
Wrap up and squeeze in blanket
Pulling and pushing
Swimming
Arm wrestle
Climbing frame at playground
To bed with weighted blanket
Sit to eat with weighted vest on
Carry weighted backpack to school
Sit with weighted lap bag
Animal walks to table
Firm touch on head
Carries heavy objects
Lift heavy objects

Stomp feet
Firm hugs
Hand and foot massage
Electric massager on hands and face
Wipes table down with warm water
Spray from squeeze bottle
Sit on vibrating cushion to eat or travel
Rough and tumble play
Popping bubble wrap
Firm rub down with towel after wash
Sit amongst large, firm cushions
Running
Jumping
Walk the dog
Crash on cushions

WHAT PARENTS SAID

SCHOOL BASED STUDY (ASPECT)

**Classroom based sensory intervention
for children with autism spectrum
disorders (ASD): A pilot study using
single system design**

Caroline Mills

Dr Chris Chapparo

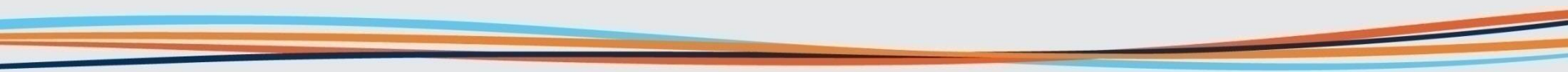
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Background

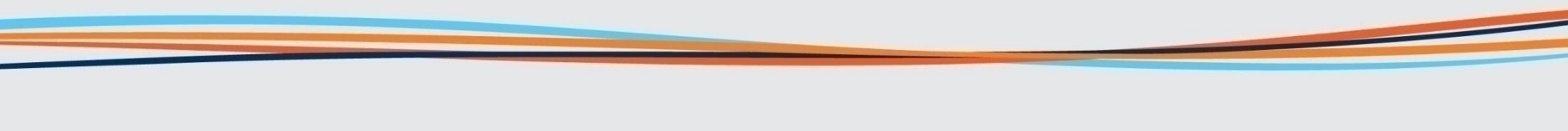
- Special school based research
- Children with ASD, ID, autism specific special school in Sydney

Research Question:

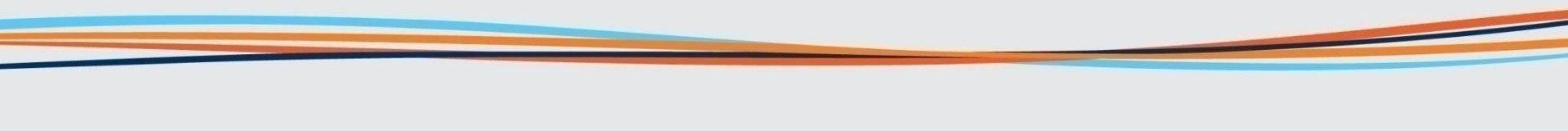
What is the impact of a Sensory Activity Schedule (SAS) on task performance in children with ASD in a classroom setting?



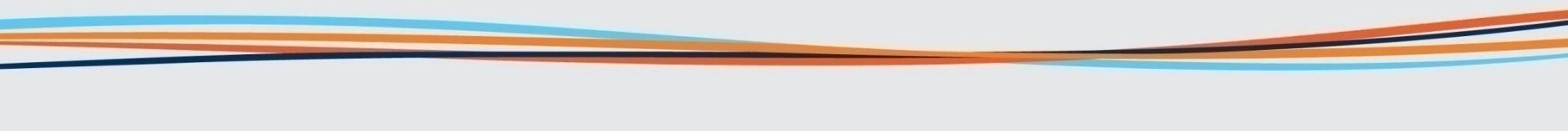
Referral and Assessment

- Referred to School OT for reduced participation
 - Teacher reported: 'Off task' behaviour- sensory seeking or sensory avoiding function, frustrated, fixed in routine
 - Short Sensory Profile findings:
 - All total scores showed definite difference
(underresponsive/seeking sensation, auditory filtering, visual/auditory sensitivity, tactile sensitivity)
- 

Method

- Single System AB design: non-concurrent, multiple baseline
 - Phase A (Baseline): Best practice teaching in ASD
 - Phase B (Intervention): Sensory Activity Schedule (SAS) + Best practice teaching
 - Desk work tasks were rated including cutting, sticking, put in tasks, puzzles and matching.
 - Teacher designed tasks
- 

Method

- Sampling of class task performance was videotaped by school staff
 - Between 11 and 18 videos were rated using procedural task analysis for each student.
 - Videos were randomly ordered and scored by researchers
 - For each student, Phase A (Baseline) and Phase B (Intervention) performances were compared.
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Intervention- Sensory Activity Schedule (SAS)

- Administered by teacher's aide and teacher.
- Morning session- after morning circle, before desk work.
- Used classroom based equipment
- 10-15 mins

Intervention

Bouncing on a therapy ball, tight lycra, deep touch pressure

Jumping on a mini-tramp, deep touch pressure

Squashing with a bean bag

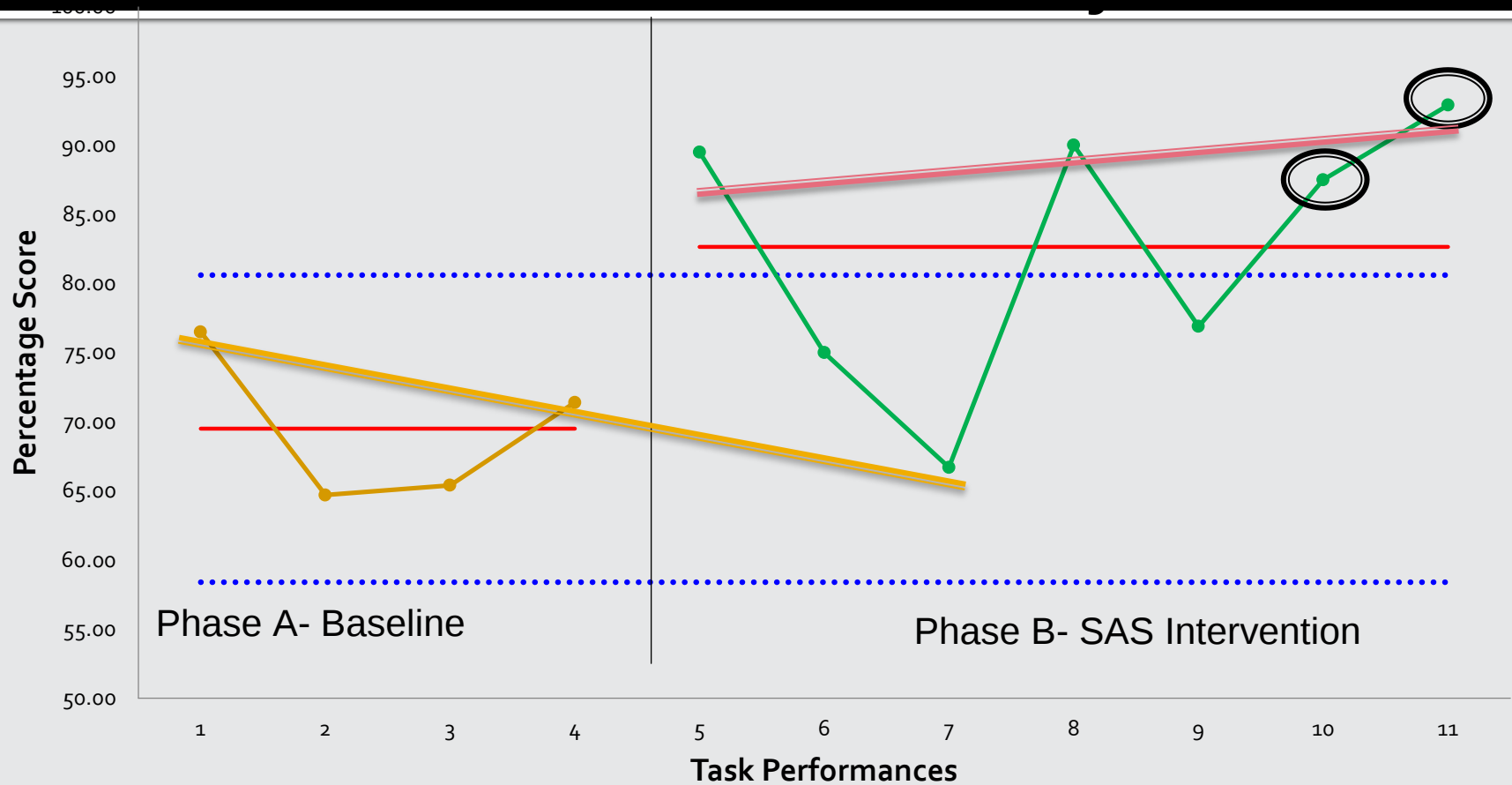
Rolled over a therapy ball,

Jumping on a mini tramp and crashing into cushions, shoulder squeezing, tight lycra

Child	Stage One Task Mastery Result		Statistics*
	Phase A (Baseline)	Phase B (Intervention)	
M	69.5%	82.64%	p=0.038**
B	86.67%	95.88%	p=0.01***
L	81.32%	84.39%	p=0.502
C	85.2%	98.18%	p<0.001***

*Two tailed, Independent Samples T test (confirmed by Mann Whitney U statistic)

** Significance at the 0.05 level, *** Significance at the 0.01 level



$p=0.038, p<0.05$

M odify Task	
A lter Expectations	
T each Strategies	
C hange Environment	How might you change the environment to suit the child's processing needs?
H elp by Understanding	

INTERVENTION FOCUS AND TYPE: EVIDENCE

- **Use of Fidgets and Fiddletoys:**
- **No evidence to support their use to reduce sensory seeking behaviour**

'Recovery' corner

MODIFYING THE PROPRIOCEPTIVE ENVIRONMENT?

INTERVENTION FOCUS AND TYPE: EVIDENCE

- **Dynamic Seating:**
- Improved sustained sitting and writing legibility for students with ADHD when seated on balls and movable cushion seating
- Some research supports improved on-task behaviours and self-regulation

INTERVENTION FOCUS AND TYPE: EVIDENCE

- **Weighted products:**
- Widespread application
- Little evidence to support use
- Small studies show some improvement in attention and in-seat behaviour
- Precautions include biomechanical stress from weight

REMEMBER

- Everyone has **unique responses** to sensory experiences that are a part of everyday occupations
- **Atypical responses** do not necessarily constitute a 'problem' which requires 'remediation'
- Intervention is when people **create effective responses to everyday sensations** that not only suit their sensory needs and preferences, but also support social and occupational participation
- **Intervention** is only required when markedly atypical responses become a barrier to participation in a manner that is acceptable to a child's particular ecology (e.g. family, school).

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