

Interoception, The 8th Sense:

The Science of How we Feel



HELIX Conference

November 16, 2022

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Session 2 10:15-12:15 (Meghan & Kelly)

Review on Traumatic Brain Injuries

- Estimated 69 million individuals are affected by TBIs each year
- Examples: concussions, epilepsy, tumors, stroke, etc.
- Areas impacted: head/brain (pain, headaches), cognitive functions, mood, ocular functions, endurance/fatigue and vestibular functions
- Recovery varies from medication to therapy
- Often times students who are impacted by a TBI need academic accommodations to participate in their roles



Dewarn et al., 2018 & Patel, 2020



Why Would Interoception Help Individuals With TBIs?

- TBI's are a traumatic event
- TBIs affected several areas of one's life
 - Neuromusculoskeletal functions, voice and speech functions, mental functions and sensory functions
- Self-regulation is a debilitating consequence of a TBI
 - Due to trauma
- Research indicates that interoception interventions can help to improve self regulation





Interoception Strategies

Adaptations for
IA

IA Builders

**COMPENSATORY
&
PREVENTATIVE**

BODY
EMOTION
ACTION



Can Interoceptive Awareness Be Changed?



YES!!

Research clearly states that interoception can be improved.

And...improving interoception is good for all of us!



What are Interoception-Based Supports?

Currently the only evidence-based intervention shown to enhance IA is Body Mindfulness



Noticing the way your body feels in the present moment



The *Established* Evidence



Why traditional body mindfulness may not work:

- Too abstract
- Requires a certain degree of cognition and attention
- Assumes a safe relationship with your internal sensations



What are IA Builders?



IA Builders:

*Adapted forms of
Body Mindfulness*

- Chunked into 1 body part
- Evoked a stronger sensation that draws attention
- Visual & Language Supports
- Playful
- Feeling, but out of the context of emotions

Squeeze a stress ball for 10 seconds. How do your hands feel?

Cold 	Warm 	Tight 
Loose 	Squeezing 	Fast 
Slow 	Sweaty 	Dry 
Messy 	Clean 	Sore 



The Interoception Curriculum

www.kelly-mahler.com

Section 1: Body Lessons 1-16

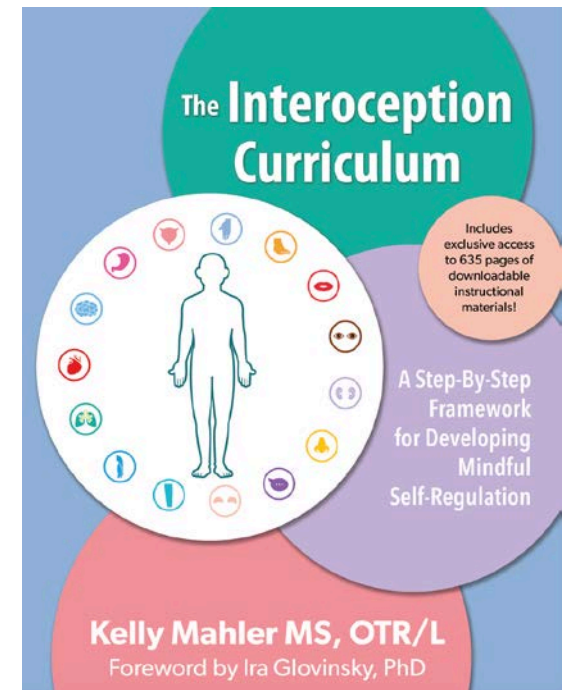
Build the learner's ability to **NOTICE** body signals in a concrete and slow method

Section 2: Emotion Lessons 17-20

Guide the learner to **CONNECT** body signals to emotion

Section 3: Action Lessons 21-25

Guide the learner to find a variety of feel-good actions that help the learner **REGULATE**



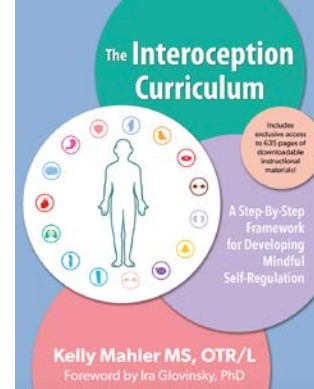
Step 1: Body





Step 1: BODY

Focus on one body part at a time



Outside

1. Hands & Fingers
2. Feet & Toes
3. Mouth
4. Eyes
5. Ears
6. Nose
7. Voice
8. Cheeks
9. Skin



Inside

10. Muscles
11. Lungs
12. Heart
13. Brain & Head
14. Stomach
15. Bladder



Step 1: BODY

Meghan's Adaptation



Outside

1. Hands & Fingers
2. Feet & Toes
3. Eyes
4. Ears
5. Skin



Inside

10. Muscles
11. Lungs
12. Heart
13. Brain & Head
14. Stomach





Step 1 Body

IA Builder: Descriptor Menu

A Visual & Language Support:











MY HANDS CAN FEEL

 COLD	 WARM	 TIGHT	 LOOSE
 WET	 DRY	 MESSY	 CLEAN
 FAST	 SLOW	 SORE	 WANT TO HIT



© Copyright 2020 by Kelly Mahler

My Eyes Can Feel:

- Heavy  
- Open  
- Itchy  
- Sore  
- Wet  

Lungs

dead tickly
 (tired) coughing
 full of ashes + tar
 fine sore
 How full of air

My Feet Feel

Wet or Sweaty



Hot



Moving/wiggly



Tight/
squeezing



Cold



Still



Sore/hurt



I don't know





Step 1 Body

IA Builder: Descriptor Menu

Meghan's Adaptation

- **First- education and explanation**
- **“Feel it out”**
 - Coloring and discussing
 - Talking through it with therapist writing words
 - Talking it through with patient writing words
- **Provide cueing**
 - Broad categories- temperature, speed
 - Opposites- hot/cold, fast/slow, wet/dry
 - Questions- when does that happen.....how about when you.....you told me when we did the last activity that.....

INTEROCEPTION BRAIN

slow	foggy	sharp	sore	pounding	pulsating
achy	focused	distracted	dizzy	blank	fried
sensitive	active	brain-frozed	spinning	sharp	settled
in-tune	tender	need to take meds	scattered	overloaded	buffering
tingly	pressurized	squeezed			

INTEROCEPTION heart

fast	slow	light	pounding	hurt	fluttering
steady	shiver	crushed	stop	dropped	unsteady
broken					




Step 1 Body

IA Builder: Focus Area Experiments

FOCUS AREA EXPERIMENTS HANDS AND FINGERS

Experiment	Makes My Hands and Fingers Feel
Put your hands in warm water for 15 seconds.	
Put your hands in cold water for 15 seconds.	
Shake your hands fast for 15 seconds.	
Smear lotion on your hands, but do not fully rub into skin for 10 seconds.	
Wipe or wash the lotion off of your skin.	
Blow on the back of your hand.	
Hold an ice cube or ice pack in your hands for 10 seconds.	
Make a fist and hold it for 15 seconds.	
Clap your hands firmly five times.	
Keep your hands as still as a statue for 30 seconds.	

Cold 	Warm 	Tight 
Loose 	Squeezing 	Fast 
Slow 	Sweaty 	Dry 
Messy 	Clean 	Sore 



Step 1 Body

IA Builder: Focus Area Experiments

Interoception-Informed Responding:

- Invite participation (never a demand)
- Encourage curiosity
- Participate together, share together
- Do during periods of regulation (when the person feels safe in their body and environment)





Step 1 Body

IA Builder: Focus Area Experiments

Interoception-Informed Responding:

- Don't require response (I wonder statements)
- Validate all responses, even when it is against what you might expect
- Provide various forms of communication
- Stay curious about internal sensation concepts (shapes, colors, etc.)



MY HANDS CAN FEEL:		
Cold	Warm	Tight
Loose	Squeezing	Fast
Slow	Sweaty	Dry
Messy	Clean	Sore



Step 1 Body

IA Builder: Focus Area Experiments

Notes:

Interoception: How does your hand feel when you are holding the ice cube?

Tactile: How does the ice cube feel?

Interoception: How do your ears feel when we listen to this song?

Auditory: Does this song sound slow or fast?



Step 1 Body

IA Builder: Focus Area Experiments

Meghan's Adaptation

- Invite them to participate
- Have their descriptor words handy
- They become invested
- Results in additional descriptor words
- Evoke more than one feeling/descriptor word

Interoception- Hands and Feet Experiments

- Rub your hands together quickly for 20 seconds
- Put your hands under hot, warm, and cold water- keep them under for 10 seconds each
- Partially rub lotion on your hands, pause for 10 seconds then rub it in completely
- Squeeze a stress ball 30 times fast
- Squeeze your hand into a tight fist and hold for 30 seconds, then release
- Rub a glue stick on one of your fingers then touch it to another
- Clap your hands 10 times firmly
- Hold your hand up in the air for 1 minute
- Partially rub hand sanitizer on your hands, pause for 10 seconds then rub it in completely
- Spread your finger out as wide as you can and hold for 15 seconds
- Shake your hands quickly for 15 seconds
- Hold an ice cube or ice pack for 30 seconds
- Hold your hand out as still as you can for 30 seconds
- Sign your name 20 times on paper
- Use a fidget spinner for 30 seconds
- Place a wet, cold towel over your foot for 15 seconds then wipe it off
- Drip warm water on your foot, keep it there for 15 seconds then wipe it off
- Shake your foot back and forth for 30 seconds
- Stand on your tiptoes for 30 seconds
- Complete 20 calf raises
- Squeeze your toes and hold for 15 seconds
- Lightly drag a feather or tissue over the bottom of your foot 3 times
- Jump up and down 15 times
- Lift up your toes, keeping your heels on the floor then put them back down slowly 15 times
- Curl and release you toes 15 times fast
- Walk back and forth across the room 5 times
- Rub your feet on the floor for 30 seconds
- Firmly massage your foot for 30 seconds



Let's Give It A Try!



- **Hands**

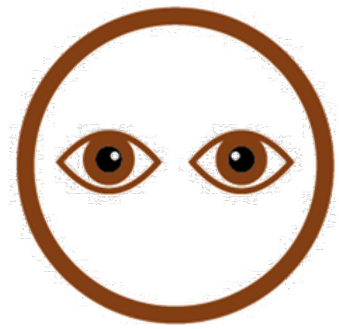
- Hot
- Cold
- Fast
- Slow
- Tight
- Loose
- Sore
- Fidgety
- Still
- Sweaty
- Stiff
- Dirty
- Clean
- Tingly
- Wet
- Dry

- **Experiments**

- Rub your hands together for 20 seconds
- Squeeze your hands into a tight fist and hold for 30 seconds, then release
- Hold you hand out as still as you can for 20 seconds
- Spread you fingers out as wide as you can and hold for 20 seconds
- Wiggly all your fingers for 20 seconds
- Clap your hands firmly 10 times



Let's Give It A Try!



- **Eyes**

- Sore
- Strained
- Tight
- Heavy
- Pulling
- Blurry
- Focused
- Distracted
- Sharp Pain
- Watery
- Dry
- Wet
- Burning
- Wide
- Heavy
- Twitchy

- **Experiments**

- Stare at a point on the wall then wiggle your hands in your periphery for 10 seconds
- Squeeze your eyes shut hard and hold for 10 seconds
- Squint your eyes, hold them there for 10 seconds
- Hold your eyes open wide for 30 seconds, trying not to blink
- Hold your finger up close to your nose and look at your finger, and hold for 5 seconds



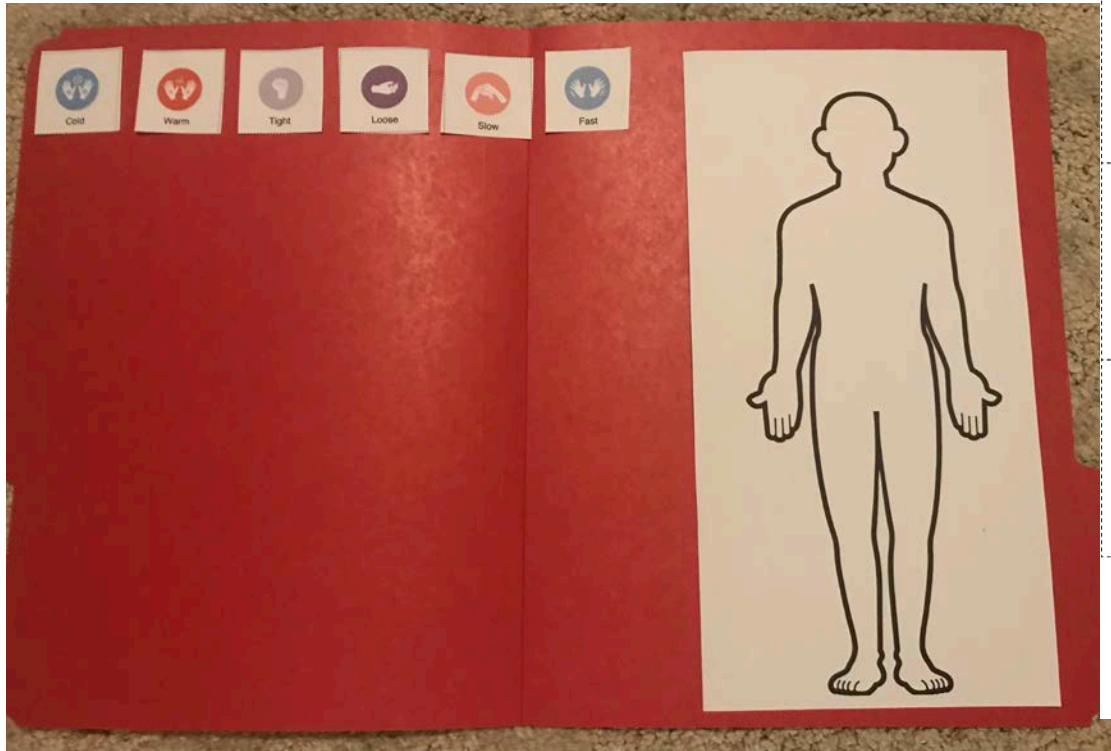
IA Builder: Body Checks

Daily Practice



IA Builder: Body Check Chart

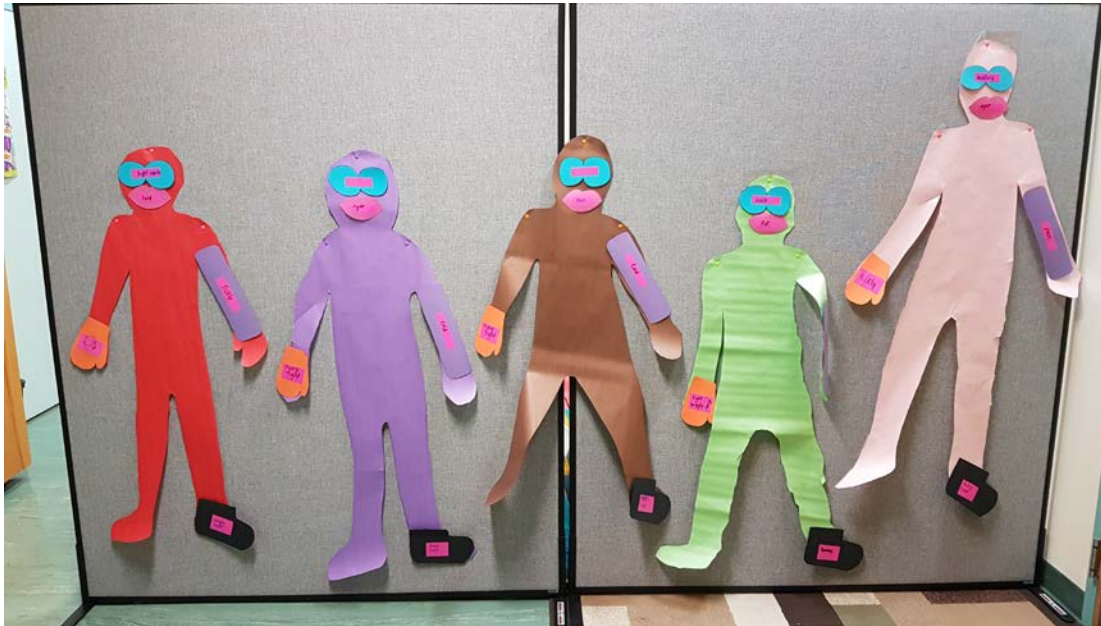
File Folder Version



 Cold	 Warm	 Tight	 Loose
 Squeezing	 Fast	 Slow	 Sweaty
 Dry	 Messy	 Clean	 Sore
	 Other	 Other	



IA Builder: Body Check Chart Life-sized Version



Anna Vander Haeghe, Alberta, Canada





IA Builder: Body Check

Meghan's Adaptation

- **Meditations**

- Completed during the session
- Sent to patient to complete at home
- Calming, personal experience
- Goal: draw more attention to the body part of the day

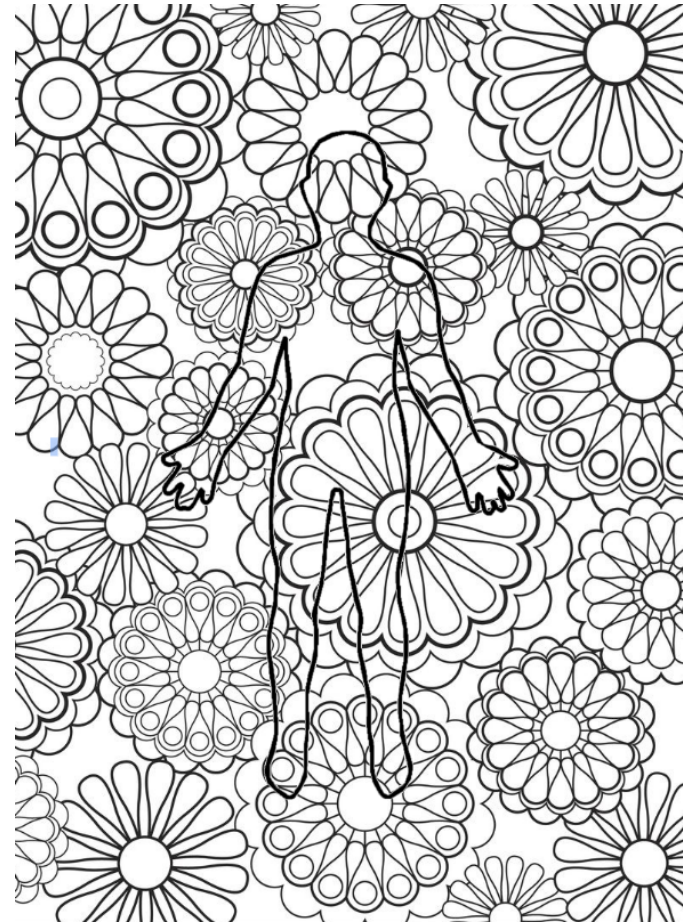




IA Builder: Body Check

Meghan's Adaptation

- **Coloring Pages**
 - Completed during the session
 - Given to the patient to do at home
 - Goal: draw more attention to the entire body while completing a calming activity

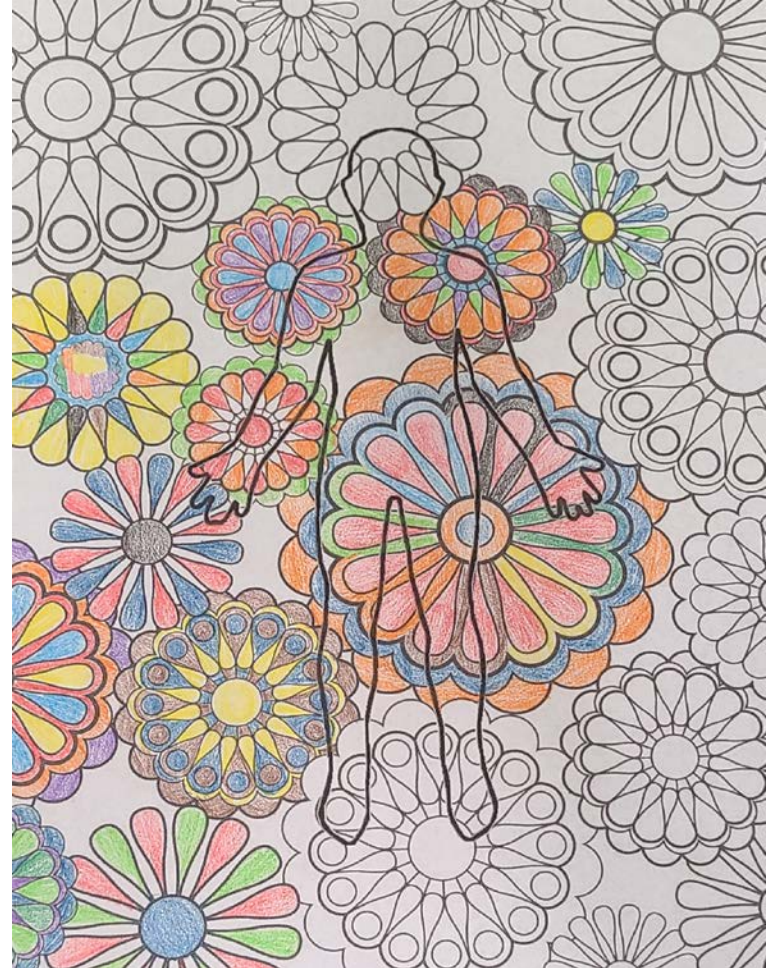
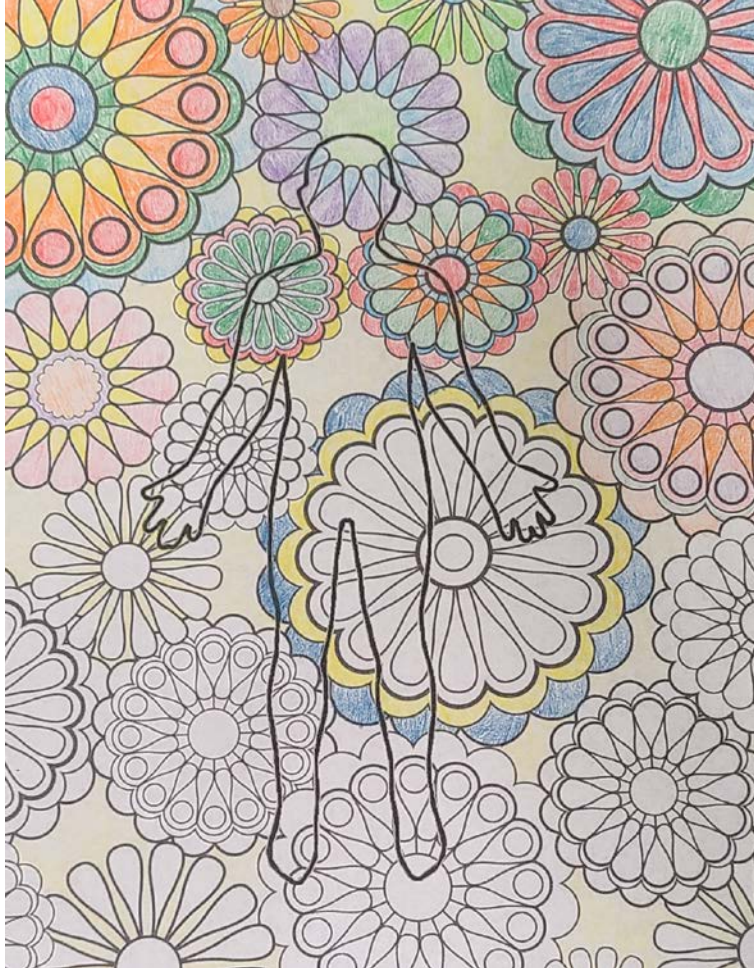




IA Builder: Body Check

Meghan's Adaptation

Coloring Examples

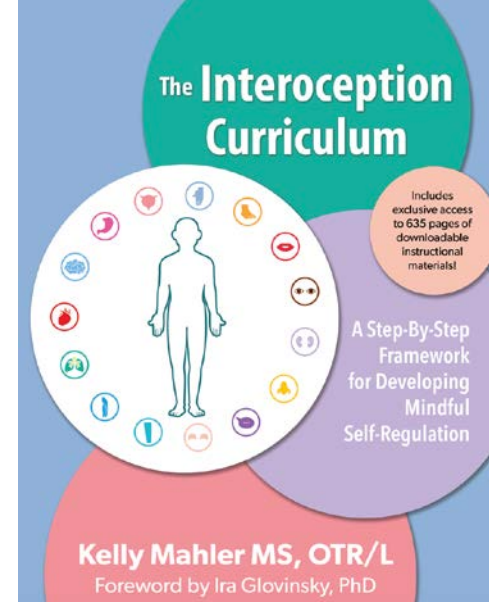




Section 1: BODY

The Fantastic Four **IA Builders**

1. Descriptor Menu
2. Focus Area Experiments
3. Body Check Chart
4. IA on the Fly



A predictable learning structure used in each lesson



Outside

1. Hands & Fingers
2. Feet & Toes
3. Mouth
4. Eyes
5. Ears
6. Nose
7. Voice
8. Cheeks
9. Skin



Inside

10. Muscles
11. Lungs
12. Heart
13. Brain & Head
14. Stomach
15. Bladder

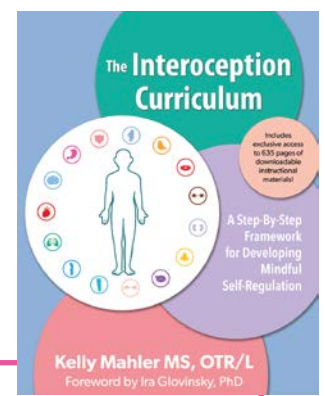
Section 2: Emotion





Section 2: EMOTION

Lesson Overview



LESSON
17

My Body Signals are Clues to My Emotions

LESSON
18

Each Emotion has Different Body Signals




LESSON
19

What's the Cause of My Body Signals




LESSON
20

Creating My Body-Emotion Chart

IA Builder: Body Math

 Burning eyes	+	 Stuffy nose	+	 Nauseous stomach	=	
---	---	--	---	---	---	--

Your body signals are clues to your emotions

 Jumping feet	+	 Fast heart	+	 Loud voice	=	
--	---	---	---	---	---	--

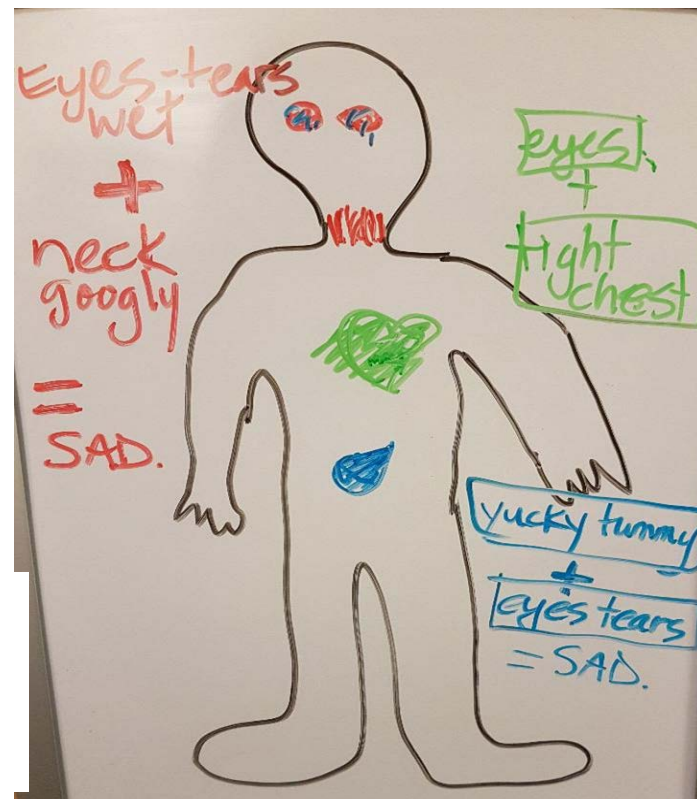
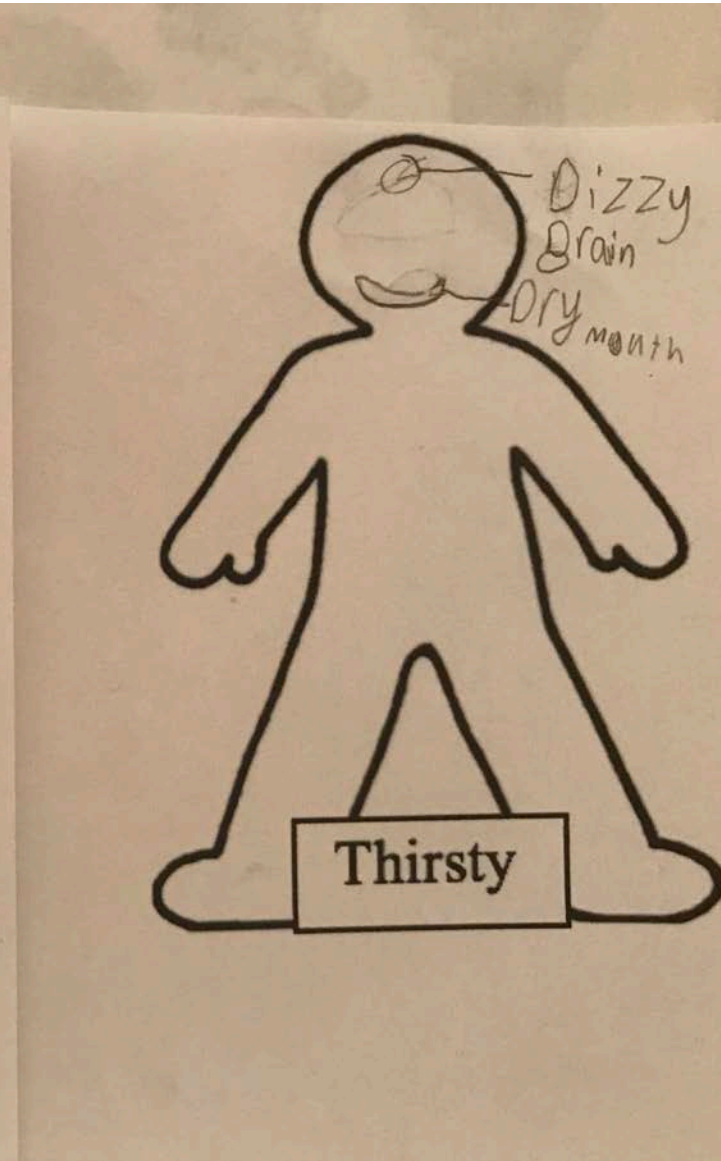
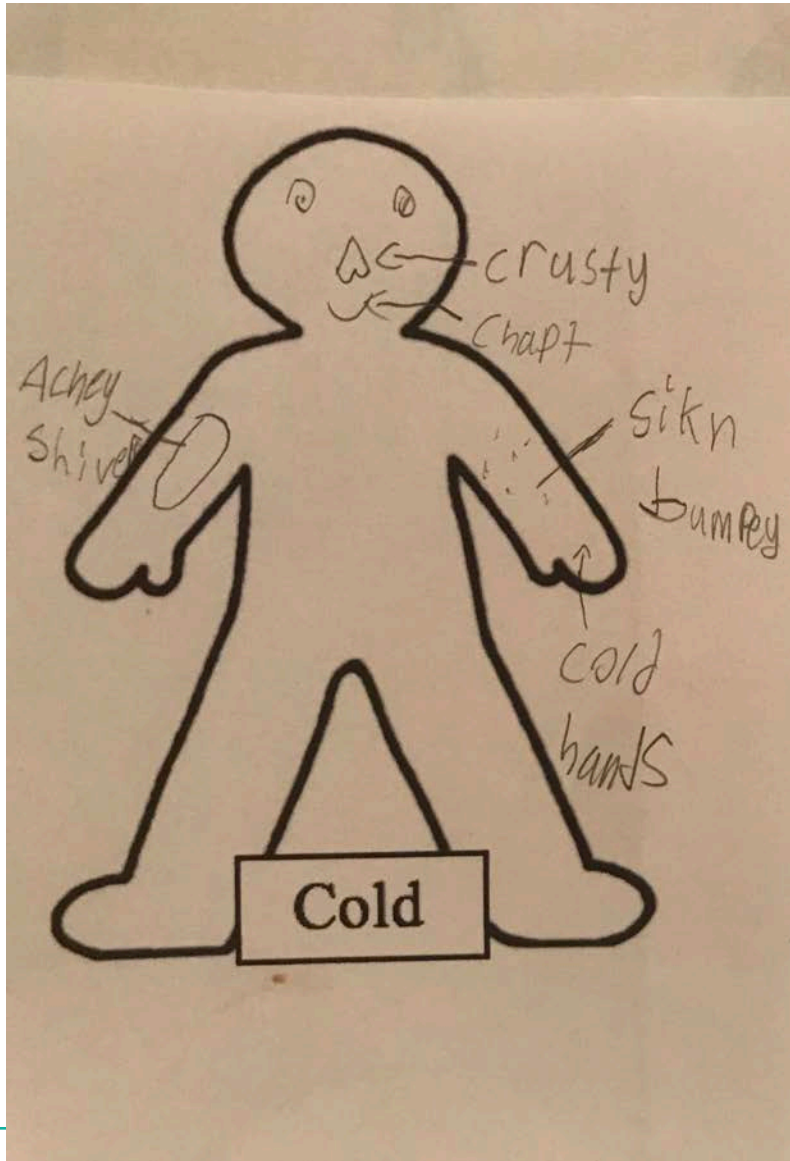


Photo credit: Anna Vander Haeghe

IA Builder: Body-Emotion Charts

Your body signals are clues to your emotions





IA Builder: Body-Emotion Chart

Meghan's Adaptation

- **Emotion Intensities**
 - 19 general emotions
 - Open discussion
 - Varying intensities on a scale
 - Low to High
 - Uncomfortable vs Comfortable
 - Each emotion has different body signals
 - Cueing for possible emotions

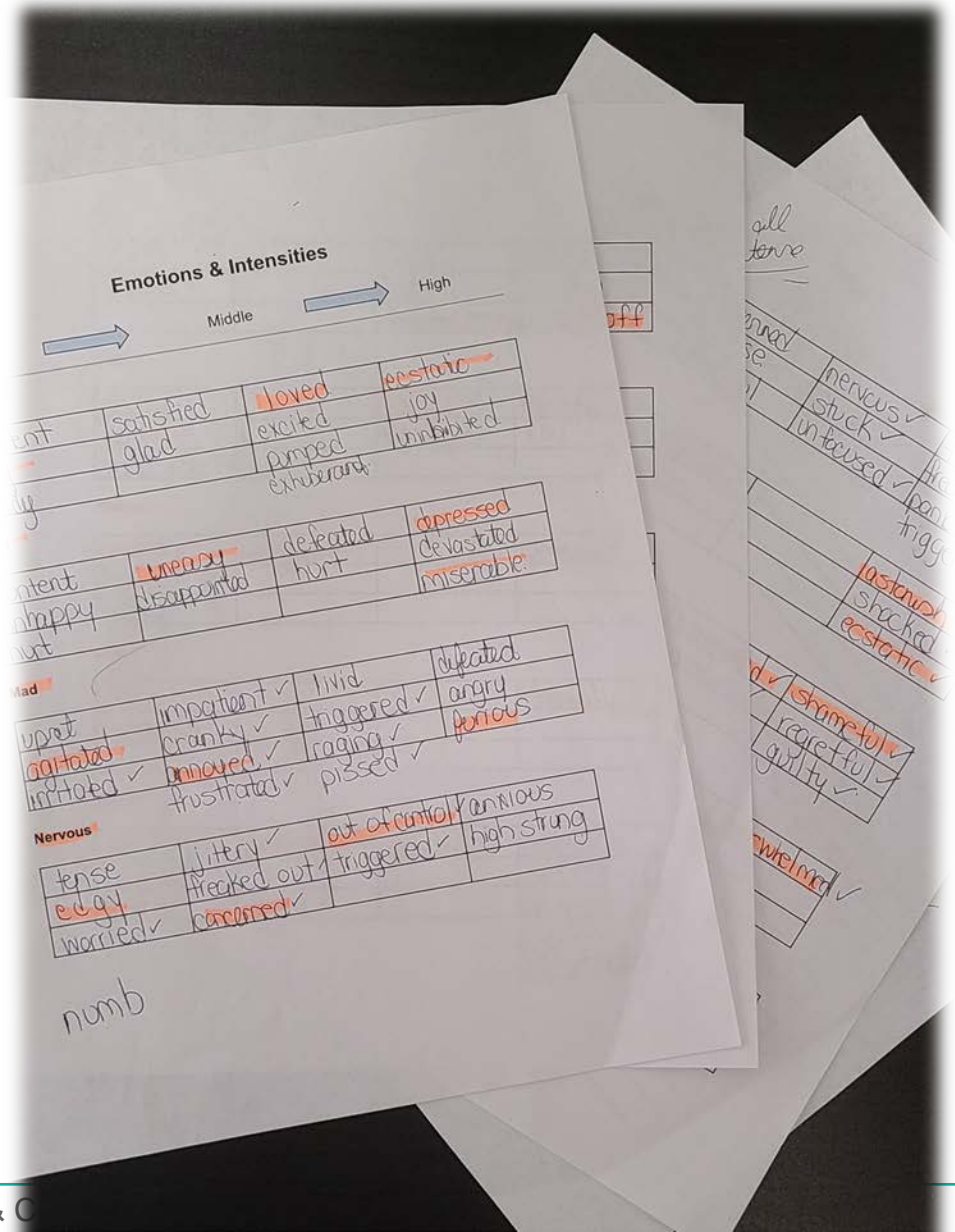
Emotions & Intensities				
Lower	→	Middle	→	High
Happy				
Sad				
Mad				
Nervous				

IA Builder: Body-Emotion Chart

Meghan's Adaptation

- General Emotions

- Happy
- Sad
- Mad
- Nervous
- Hungry
- Thirsty
- Distracted
- Focused
- Calm
- Anxious
- Surprised
- Embarrassed
- Stressed
- Full
- Hot
- Cold
- Sleepy
- Sick
- Hurt





IA Builder: Body-Emotion Outline

Meghan's Adaptation

Body Outlines

- Highlighting 2+ emotions from each category
- Writing emotions in body outline boxes
- Working through each emotion, documenting how the body would feel with that emotion

Emotions

<p>Happy</p> <ul style="list-style-type: none"> • Hands- fidgety • Feet- fidgety • Ears- focused • Heart- steady • Lungs- steady • Muscles- loose • Brain- focused, settled 	<p>Depressed</p> <ul style="list-style-type: none"> • Hands- numb • Feet- heavy • Eyes- heavy, watery, stuck, full • Ears- shut off • Skin- cold • Muscles- frozen, heavy • Lungs- heavy, collapsed • Heart- slow, heavy, empty • Stomach- heavy • Brain- numb, blank 	<p>Anxious</p> <ul style="list-style-type: none"> • Hands- fidgety, tight • Feet- shaky, want to run • Eyes- jumpy • Ears- distracted • Skin- clammy • Muscles- tense • Lungs- fast • Heart- pounding • Stomach- knotted, pit • Brain- racing, distracted
<p>Scared</p> <ul style="list-style-type: none"> • Hands - shaking • Ears- focused • Eyes- wide • Skin- goosebumpy • Muscles- shaky, tight • Lungs- fast • Heart- fast • Brain- focused, distracted • Stomach- dropped 	<p>Overwhelmed</p> <ul style="list-style-type: none"> • Hands- shaky, fidgety • Feet- want to run/walk away • Ears- distracted, sensitive • Eyes- jumpy, shut, tight • Skin- creepy crawly • Muscles- tight • Lungs- fast, sore • Heart- racing • Brain- fried, racing • Stomach- nauseous, knotted 	<p>Furious</p> <ul style="list-style-type: none"> • Hands- tight, fisted • Feet- curled • Ears- shut off, hot • Eyes- sharp, focused • Skin- hot • Muscles- tight • Lungs- panting • Heart- pounding • Brain- jumbled
<p>Excited</p> <ul style="list-style-type: none"> • Hands- flappy • Feet- shaky, want to dance • Eyes- wide • Muscles- loose, wiggly • Lungs- fast • Heart- fluttering • Brain- racing, distracted 	<p>Upset</p> <ul style="list-style-type: none"> • Hands- slow • Feet- want to walk away • Eyes- teary, squinty • Muscles- slow, tense • Lungs- heavy • Brain- distracted 	<p>Hungry</p> <ul style="list-style-type: none"> • Hands- fidgety • Eyes- wide • Brain- focused • Stomach- growling • Mouth- watering



IA Builder: Body-Emotion Charts

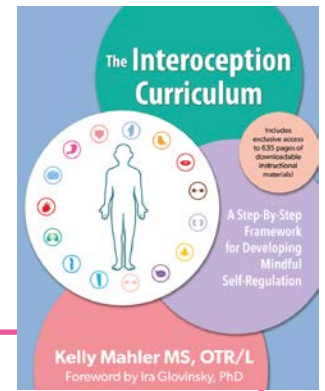
Meghan's Adaptation

- **Body Outlines**
 - Open discussion
 - Unique to every individual
 - People are learning a lot about themselves
 - Provide information about what others may experience
 - Completing in sessions and/or taking home to complete as well



Section 3: ACTION

Lesson Overview



LESSON 21

My Body Can Feel Comfortable, My Body Can Feel Uncomfortable

LESSON 22

I Can Change The Way My Body Feels

LESSON 23

I Can Change The Way My Body Feels When It Is Uncomfortable

LESSON 24

Discovering New Feel-good Actions

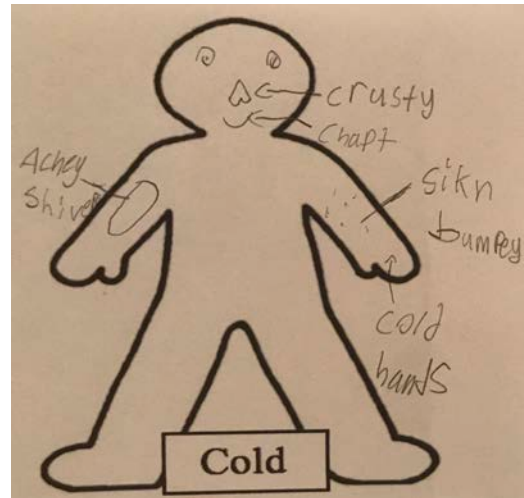
LESSON 25

Make My Own Feel-good Menu

IA Builder: Body-Emotion-Action Chart

Body, Emotion, Action Chart (sample)

My **BODY** Feels



EMOTION: COLD

My Feel-Good **ACTIONS**:

_____ **Put on a Jacket** _____

_____ **Wrap in a blanket** _____

_____ **Ask someone to turn up the heat** _____

_____ **Go inside** _____



IA Builder: Body-Emotion-Action Chart

Body (what it feels like inside)	Emotion (what I am feeling)	Action (what helps me feel more comfortable)
<ul style="list-style-type: none">• Feet- Want to run away• Skin- Zaps all over• Ears- Extreme Pain	Sensory Overwhelm	<p>Me:</p> <ul style="list-style-type: none">• Go somewhere quiet• Put on headphones• Deep pressure menu <p>What I need from others:</p> <ul style="list-style-type: none">• Quiet support (stay close, but shhhhh)• Put headphones close to me• Be patient



IA Builder: Body-Emotion-Action Chart

MY FEEL -GOOD MENU



Clap hands & Count to 10



Squeeze fists & Count to 10



Stomp feet & Count to 10



Curl toes & Count to 10

Body-Action

FOR SCHOOL

When I feel the need to bite



1. I need to communicate I need help. To get help I can



SAY HELP



HOLD UP RED HAND SIGN



PRESS HELP ON AAC

2. Go to safe spot

3. Do coping skills. To cope I can:



Section 3: ACTION

Meghan's Adaptation

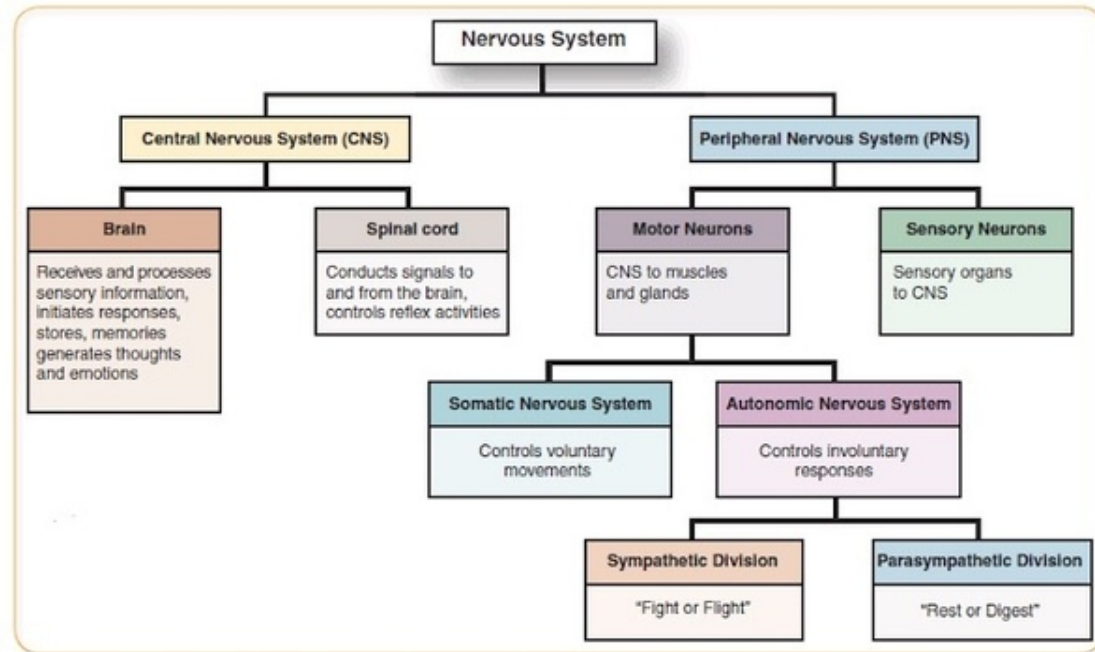
- **Feel Good Toolbox**
 - Open discussion
 - Reviewing various themes with possible ideas
 - Would this make your body feel comfortable or uncomfortable?
 - Coloring coding activities for weekly routine, everyday routine & in the moment
 - Rooted in vagus nerve activation



Section 3: ACTION

Meghan's Adaptation

- Why Use Vagus Nerve Activation Strategies?
 - Fight or Flight
 - Rest and Digest
 - Trauma = damaged vagus nerve
 - Stuck in Fight or Flight
 - Increasing heart rate, releasing cortisol
 - Relaxes ciliary muscles, more incoming light
 - Enhances far vision
 - Difficulties with IA, only surviving
 - Hack into the vagus nerve
 - Bring the individual back to calmer state



Dana, 2020; Power, 2020 & van der Kolk, 2014



IA Builder: Individual Feel Good Toolbox

Exploring even more

Focus Area Experiments.

Does this make my body feel comfortable?

Connecting

- Expressive journalism
 - Reflecting on WHO- people in your life who make you feel safe and welcomed
 - Reflecting on WHAT- what actions make you feel alive
 - Reflecting on WHERE- tour your world, what places bring you cues of safety and happiness
 - Reflecting on WHEN- moments you have felt safe and content, revisit the experiences
- Body scans
- Walking in nature barefoot for regulation and restoring (forest bathing)
- Labyrinth walking or tracing for a return to calm (<https://labyrinthsociety.org/>)
- Find your safe, calming space
- Creating "If/Then" Statements
- Exposing your skin to the sunlight and moonlight (3x/day, 5 minutes)
- Meditations (loving-kindness)
 - Guided (Relief app)
- Affirmations (manifest app)
- Praying (Youversion app)
- Hugs



IA Builder: Individual Feel Good Toolbox

Exploring even more Focus Area Experiments.

Does this make my body feel comfortable?

Deep Pressure

- Weighted blanket
- Weighted vest
- Sleeping on your right side- place a pillow in between your knees
- Baths
- Vibration (theragun, handheld massager, foot massager, back of chair massager)
- Shakti mat
- Standing in the corner of a room pushing your back and shoulders against both walls
- Roll a heavy ball over your legs when sitting down or your arms when lying down
- Therabands
- Hair elastics
- Seat cushions
- Stress balls
- Medicine balls
- Punching bag



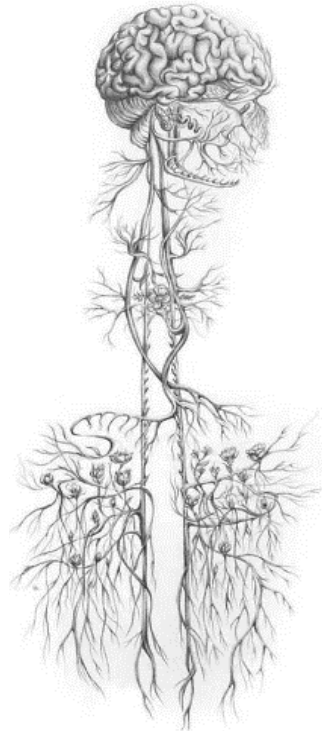
IA Builder: Individual Feel-Good Menus

Exploring even more Focus Area Experiments.

Does this make my body feel comfortable?

- **Possible useful strategies to implement and to encourage**

- Deep breathing
 - Vagus nerve activation is breathing in for 3 seconds, out for 6 seconds
 - Opening the heart breathing
- Body Scans- localizing type and intensity of pain
- Yoga ball as a seat
- Blowing up a tough balloon
- Cold temperatures- hands washing, splashing water on face or neck, cold packs on head/neck/eyes
- Standing to complete work
- Ear plugs/noise cancelling head phones
- Blue light filters
- Eye breaks (20-20-20 rule but use IA)
- Expressive Journalism
- Fidgets, smooth stones, hair elastics
- Stress balls
- Head massagers
- Proprioceptive tasks
- Vibration (theraguns, handheld massagers)
- Mints and gum
- Using a straw
- Humming/singing
- Increased salivation
- Repetition- coloring, crosswords, sudoku etc.
- Creating to-do lists/routines
- Listing 3 positive things that happened during the day
- Having a calm, safe space
- Positive affirmations
- Laughter
- Exposing skin to the sun





IA Builder: Master Feel-Good Menu

My Routine

To Do Everyday: deep breathing, cold shower, inversion, exposing skin to sun, singing/humming, listening to music, salt lamps, body shakes, journaling, 3 compliments, to-do lists, eye breaks, cold pack on eyes, coloring, essential oils, smooth stones, chewing gum/sucking on a mint, weighted blanket, full body scans, salivating, half-smile

In The Moment: salivating, stress balls, hair elastics, gargling, yoga ball, cold water in the shower/tub/face, theragun, body shakes, go for a run, sensory bin, putty, punching bag, yoga ball bouncing, singing/screaming, deep breathing, inversion

Monday: Yoga, listen to funny podcast/audiobook, taking pictures, take a bath

Tuesday: Walk, meditations, playing piano

Wednesday: Yoga, puzzle/crossword, sign language class/review, take a bath

Thursday: Walk, hanging out with a friend, looking at old pictures- sending to a friend

Friday: Yoga, milkshake, take a bath



The Interoception Curriculum: Direct Evidence



Year 1:

n=8 children with
autism;
school-based

JOURNAL OF OCCUPATIONAL THERAPY, SCHOOLS, & EARLY INTERVENTION
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An Interoception-Based Intervention for Children with Autism Spectrum Disorder: A Pilot Study

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ABSTRACT

The ability to notice internal sensations such as tense muscles, a rumbling stomach, or heavy eyelids and translate these internal sensations into emotional meaning such as anger, hunger, and fatigue is an important skill called interoceptive awareness. Deficits in interoception have been discovered within many conditions including autism spectrum disorders (ASD), obesity, depression, trauma, and others. The purpose of this study was to examine the effectiveness of a condensed, 8-week intervention based on *The Interoception Curriculum: A Guide to Developing Mindful Self-Regulation (IC) in children with ASD*. Given the novelty of this intervention topic, an intentionally small pilot study was completed with eight autistic students, ages 6–13 years, enrolled in self-contained autism support classrooms. A significant increase in scores on an interoception measure were found as a result of the intervention. Interoception is hypothesized in the research as being foundational for emotional regulation and occupational performance. Therefore, these preliminary findings provide support for future, larger studies that examine the effectiveness of interoception-based interventions, such as the IC.

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occupational therapy;
emotional regulation



The Interoception Curriculum: Direct Evidence



Year 2:

n=9 children with mixed diagnoses;
school-based





The Interoception Curriculum: Direct Evidence



Year 3:

n=150+ children with mixed diagnoses;
school-based & outpatient
17 sites; 4 countries





The Interoception Curriculum: Direct Evidence



Year 3:

n=99 children with mixed diagnoses;
school-based & outpatient



- The participants in this study experienced statistically significant gains in IA and emotional regulation after only 8 weeks of The Interoception Curriculum!!!
- ASD n=54; other n=53



The Interoception Curriculum: Direct Evidence



Year 4:

n=99 children with mixed diagnoses;
school-based & outpatient



Elizabethtown College
Occupational Therapy
Interoception Researchers

Class of 2020
MSOT

- The participants in this study experienced statistically significant gains in IA and emotional regulation after only 8 weeks of The Interoception Curriculum!!!
- ASD n=54; other n=53



The Interoception Curriculum: Direct Evidence



Year 4:

n=69 children with mixed diagnoses;
school-based & outpatient



- Participants reported IA challenges, BUT the caregivers (both educators and parents) did not score the children as having the same level of IA concerns, despite reporting significant concerns regarding the child's behavior.
- This statistically significant mismatch, improved after an 8-week use of The Interoception Curriculum, resulting in a statically significant match at the end.



The Interoception Curriculum: Direct Evidence



Year 5:

n=17 children with ASD in a school-based setting
Full 25 lesson Curriculum



- The participants in this study experienced statistically significant gains in IA & Emotion Regulation
- Additionally, reported statistically significant gains in the following: Eating/Feeding, Thirst Pain/Healthcare Management, Emotional Response & Emotional Awareness



The Interoception Curriculum: Direct Evidence



MEGHAN

n= 9 adults with mTBIs (concussions) in an outpatient occupational therapy facility
Using an adapted version of the interoception curriculum- 6 weeks long

- The participants in this study, who have completed the curriculum, experienced statistically significant gains in interoceptive awareness and overall self-regulation (emotional control/awareness, self-monitoring)
- In addition, improvements were recorded in other areas such as working memory, attention, inhibition, initiation, shifting, planning/organizing, task monitoring and organization

Conclusion





THANK YOU!!

FOR MORE INFORMATION:

- www.kelly-mahler.com
- Facebook-Interoception: The Eighth Sensory System

