


Interoception, The Eighth Sense: Related to Sensory Integration



Baltic Nordic SI Congress
March 25, 2022
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Potential Trigger Warning:

- You will be invited throughout this session to tune into your inner body signals.
- We will also discuss trauma.
- Please participate in this session in a way that meets your comfort level.

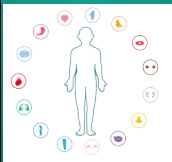
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Your inner experience is always correct and valid.

- There are **no wrong** interoception experiences. We all have very different inner experiences.
- Also, there is **no wrong way** to express the sensations you might notice.
- It is okay to not know how you feel.
- It is okay to not want to feel.
- It is okay to not want to share **how you feel** with others.

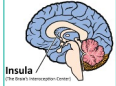
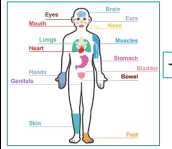
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What is Interoception?



What is Interoception?

The Receptors in the Body + The Insula in the Brain = Emotions/Body Needs



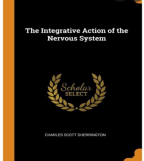

Homeostatic Emotions			Affective Emotions		
Hunger	Fatness	Thirst	Excitement	Distraction	Disappointment
Sensory Overload	Pain	Joy	Frustration	Calmness	Anger
Illness	Body Temperature	Fear	Safety	Sadness	Love
Physical Exertion	Sleepiness	Love	Focus	Anxiety	Need for the Bathroom
		Boredom	Enraged		

Interoception gives us information regarding **how our body feels & what it needs for comfort/regulation.**


Craig, 2002; Critchley et al., 2004
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The History of Interoception Science

1906 Sir Charles Sherrington

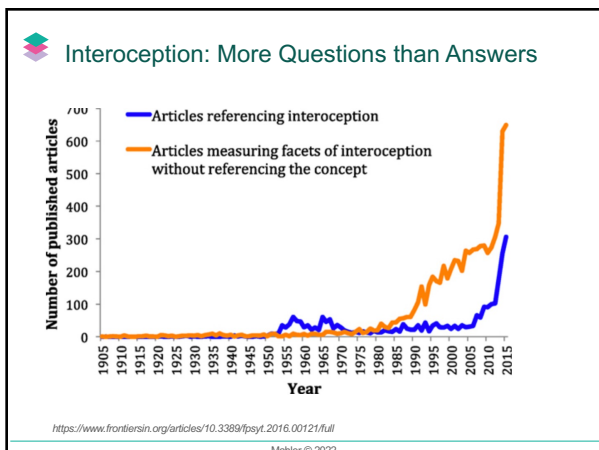


2002 Dr. Bud Craig



How do you feel? Interoception: the sense of the physiological condition of the body

www.Wikipedia.org (images)
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The Two Branches of Interoception

Implicit Interoception

- Unconscious, automatic responses for homeostasis
- For example, blood pressure increases before you stand-up; liver releasing enzymes; pH levels/glucose/ion concentration continually adjusted, etc.

Explicit Interoception

- Conscious experience of body signals and emotions
- aka Interoceptive Awareness

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Interoceptive Awareness (IA)


The ability to:

1. **NOTICE** body signals
2. **CONNECT** body signals to the emotion
3. **REGULATE** with an action that promotes internal comfort

Better Insula = Clearer Interoceptive Awareness (IA)

Critchely et al., 2004
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IA & Early Learners



Explicit (conscious) interoception present at birth:

- For example, hunger, thirst, body temperature awareness
- Infant motivated to act based on discomfort in body and this is rewarded by 'feel-good' sensations delivered from the caregiver.
- In turn, the caregiver receives 'feel-good' sensations and is rewarded from the infant smiling or showing comfort.
- Thus, IA serves as the foundation, the driver of the **attachment process**.


Implicit (Unconscious) Interoception



Explicit (Conscious) Interoception

(Harshaw, 2008)

IA: How Does My Body Feel in the Sensory World?



How does this smell make my body feel?

How does this sound make my body feel?

How does this touch make my body feel?


How does this sight make my body feel?

How does this taste make my body feel?

How does this movement make my body feel?

What exactly is sensory reactivity? Is it truly auditory over-responsivity OR is it an intense interoceptive reaction to the sound?


IA & Early Learners



Explicit (conscious) interoception present at birth:

- Infant links internal sensations with events, objects, people in the environment
- Learn what feels comfortable and what feels uncomfortable (e.g., feeding links to feelings of satiety)
- These internal responses are stored as **Somatic Markers or Interoceptive Predictions** and guides intuitive decision making as infant grows
- Thus, IA provides foundation of self-regulation
 - **Seek** the comfort experiences
 - **Avoid** or **detach** from aversive experiences

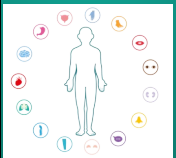
Implicit (Unconscious) Interoception



Explicit (Conscious) Interoception

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Unique Inner Experiences



WE ALL HAVE UNIQUE INTEROCEPTION EXPERIENCES!



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IA: A Variety of Extremes


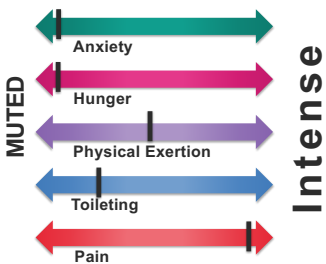
Body Signals	Sensory Processing Disorder	Characteristics
too big	SMD: Over-responsive	<ul style="list-style-type: none"> • Intense • Overpowering • Many body signals noticed all at once
too small	SMD: Under-responsive	<ul style="list-style-type: none"> • Muted • Don't notice body signals until they are intense OR • They go completely unnoticed
distorted	Discrimination Disorder	<ul style="list-style-type: none"> • Body signals are noticeable, but not clear enough to give specific detail about the exact location or type of feeling

(Mahler, 2019; Miller, Anzalone, Lane, Cermak, Osten, 2007; Endow, 2010)

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IA: a Sliding Scale

MUTED Intense

Anxiety
Hunger
Physical Exertion
Toileting
Pain

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Signs of IA Extremes

(not exhaustive nor prescriptive)

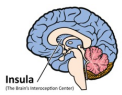
- ✓ Bowel/bladder leakage or frequent bathroom trips
- ✓ Intense/muted response to changes in body temperature
- ✓ Not seeking out food/drink
- ✓ Over-eating
- ✓ Intense/muted response to feelings of injury/illness (or only when it is very significant)
- ✓ Intense/muted response to feelings of fatigue/sleep

- ✓ Meltdowns or Shutdowns
- ✓ Not seeking out 'coping strategies' when needed
- ✓ Emotions seem to go from 1-100 in a split second
- ✓ Difficulty sharing how they feel
- ✓ Emotion words have little meaning
- ✓ Easily dysregulated when others are dysregulated
- ✓ Can't tell you 'what is wrong'

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IA Extremes

Connected to Many Conditions



Autism	Trauma Disorders
Depression	Obsessive Compulsive Disorder
Anxiety	Panic Disorder
ADHD	Suicide Attempters
Eating Disorders	Drug & Alcohol Addiction
Obesity	Chronic Pain Syndromes
SPD	Sensory Processing Disorder
Dementia	Self-injurious behavior

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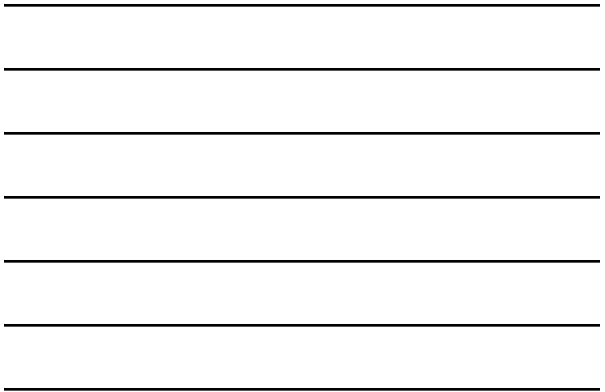
IA Extremes & Mental Health

Interoception and Mental Health: A Roadmap

Sahib S. Khalsa, Ralph Adolphs, Oliver G. Cameron, Hugo D. Critchley, Paul W. Davenport, Justin S. Feinstein, James D. Foxe, Sarah N. Garfield, Richard D. Lane, Wolf E. Mehlhans, Alicia E. Meuret, Charles E. Nemeroff, Stephen Oppenheimer, Frederike H. Putz-Anderson, Olaf Pieltoja, James L. Rhydy, Lawrence P. Schroyer, W. Kyle Simmons, Murray B. Stein, Klaus E. Stephan, Olmge Van den Bergh, Ilse Van Dieet, Andreas von Leupoldt, Martin P. Paulus, and the Interoception Summit 2016 participants

Table 3. Diagnostic Symptoms and Clinical Signs Indicating Interoceptive Dysfunction in Some Psychiatric Disorders

Psychiatric Disorder	Symptoms	Signs	Sample Studies
Panic Disorder	Palpitations, chest pain, dyspnea, choking, nausea, dizziness, flushing, depersonalization/derealization	Elevated heart rate and/or blood pressure, exaggerated escape, startle, and flinching	(5,140,141)
Depression	Increased or decreased appetite, fatigue, lethargy	Weight gain, weight loss, psychomotor slowing	(142,143)
Eating Disorders	Hunger insensitivity, food anxiety, gastrointestinal complaints	Severe food restriction, severe weight loss, bingeing, purging, compulsive exercise	(72,98)
Somatic Symptom Disorders	Multiple current physical and nociceptive symptoms	Medical observations do not correspond with symptom report	(144,145)
Substance Use Disorders	Physical symptoms associated with craving, intoxication, and/or withdrawal (drug specific)	Elevated/decreased: heart rate, respiratory rate, and/or blood pressure, pupil dilation/constriction, others (drug specific)	(101,146,147)
Posttraumatic Stress Disorder	Autonomic hypervigilance, depersonalization/derealization	Exaggerated startle, flinching, and/or escape responses, elevated heart rate and/or blood pressure	(148)
Generalized Anxiety Disorder	Muscle tension, headaches, fatigue, gastrointestinal complaints, pain	Trembling, twitching, shaking, sweating, nausea, exaggerated startle	(149,150)
Depersonalization/Derealization Disorder	Detachment from one's body, head fullness, tingling, lightheadedness	Physiological hypoactivity to emotional stimuli	(151,152)
Autism Spectrum Disorders	Skin hypersensitivity	Selective clothing preferences	(107,153,154)



IA Extremes & Mental Health

National Institutes of Health: Declares Interoception as a Research Domain

Participating Organization(s) National Institutes of Health (NIH)

Components of Participating Organizations

- National Center for Complementary and Integrative Health (NCCIH)
- National Eye Institute (NEI)
- National Institute on Aging (NIA)
- National Institute on Alcohol Abuse and Alcoholism (NIAAA)
- National Institute of Biomedical Imaging and Bioengineering (NIBIB)
- Eunice Kennedy Shriver National Institutes of Child Health and Human Development (NICHD)
- National Institute of Dental and Craniofacial Research (NIDCR)
- National Institute on Drug Abuse (NIDA)
- National Institute of Environmental Health Sciences (NIEHS)
- National Institute of Mental Health (NIMH)
- National Institute of Neurological Disorders and Stroke (NINDS)
- National Institute of Nursing Research (NINR)
- National Center for Advancing Translational Sciences (NCATS)

All applications to this funding opportunity announcement should fall within the mission of the Institutes/Centers. The following NIH Offices may co-fund applications assigned to those Institutes/Centers.

Office of Behavioral and Social Sciences Research (OBSSR)


<https://grants.nih.gov/grants/guide/rfa-files/RFA-AT-21-003.html>

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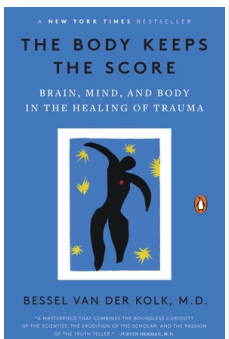


IA Extremes & Trauma

Almost every brain imaging study of trauma patients finds abnormal activation of **THE INSULA** (Van Der Kolk, 2014)



Insula
(The Sixth Interoceptive Center)



THE BODY KEEPS THE SCORE
BRAIN, MIND, AND BODY IN THE HEALING OF TRAUMA
BESSEL VAN DER KOLK, M.D.

(Claussen, et al. 2019; Marusak, Etkin, & Thomason, 2015; Van Der Kolk; Ansell, Rando, Tuil, Guarnaccia, & Sinha, 2012; Herringa, Phillips, Almeida, Insana, & Germain, 2012)

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IA Extremes, Trauma & Neurodiversity
Expanding our View of Trauma

Free Blog/Video
www.kelly-mahler.com

- Sensory Trauma
- Trauma from being Chronically Misunderstood
- Compliance Trauma
- Social Trauma

UNSAFE, UNHEARD AND MISUNDERSTOOD
 TRAUMA FROM BEING ATYPICAL LIVING IN A TYPICAL WORLD

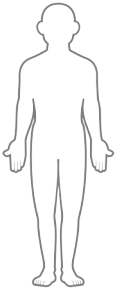


Kelly Mahler OTD, OTR/L Kim Clairy MS, OTR/L

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IA Extremes
Connected to Many "Non-Conditions"

- Over-focus on external life
- Little appreciation for the body
- Behavioral/Compliance Approaches
- Accidental 'gas lighting'



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IA Extremes & Accidental Gas Lighting
Statements that might make someone question their own inner reality

You can wait to go the bathroom

You can't possibly be hungry. You just ate

That must have made you so sad

I'll wait until you are showing me you are listening

You have nothing to worry about


You look frustrated

No big deal

Brush it off. It is just a little bump.

You don't look like you need a break

You will be okay



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IA Extremes & Gas Lighting

How does this work between 2 very different neurotypes:

- Child seeks comfort experiences that are labeled as 'atypical' or 'disruptive' (e.g. flapping, pacing, lining up toys)
- Child avoids experiences that are perceived as 'typical' or 'mandatory' (e.g., loud/bright classrooms; light touch from caregiver)

Thus, the child's inner experience is disregarded, and the child is repetitively taught (conditioned) to ignore their interoceptive experience :

- forced to stop using comfort measures to look more typical
- forced to participate in tasks/environments that cause pain and unsafe

This makes our job as sensory-informed therapists even more important

(Mahler, 2015.)

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IA Extremes & Accidental Gas Lighting

Actions that might make someone question their own inner reality

Invalidation of my sensory experiences made me feel wrong but also lead to masking/hiding my Internal dysregulation. The consequence? Mental health issues.

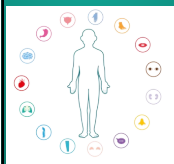
Having no positive recognition for who I truly am lead me to begin doubting reality—what is my identify?

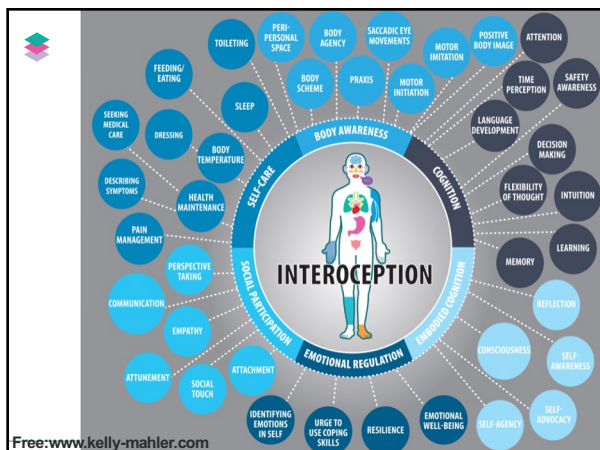
- Who am I?
- What is wrong with me?
- Why am I different?
- What am I good at?
- Where do I belong?



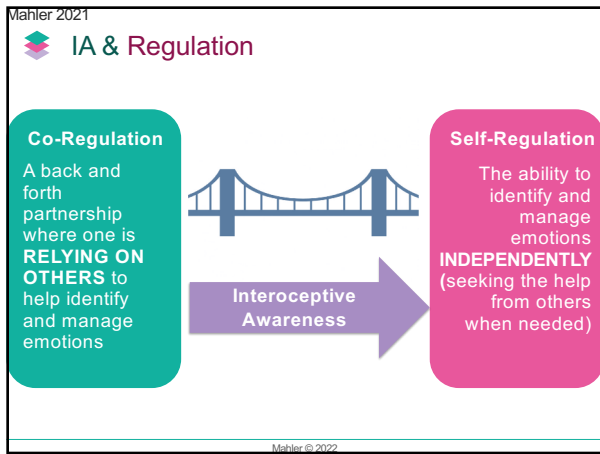
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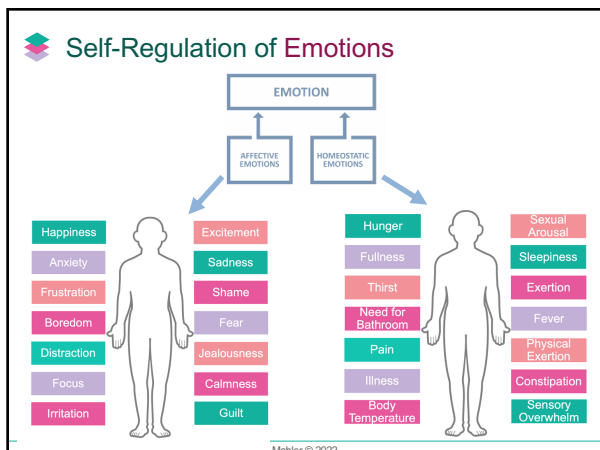
The Vast Influence of Interoception

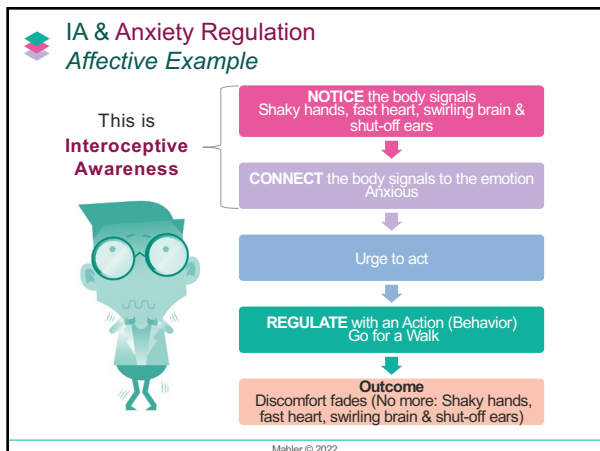












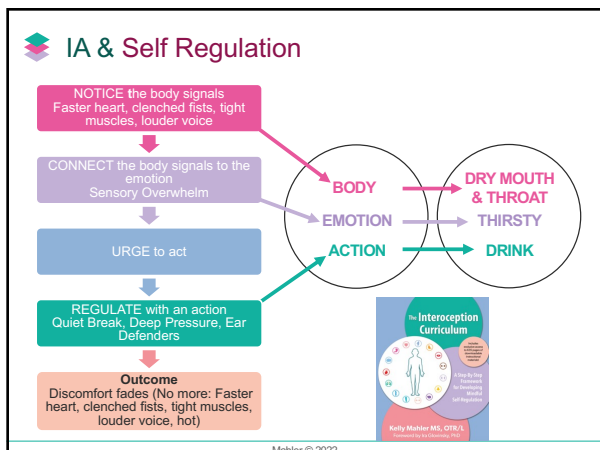
A Breakdown in IA

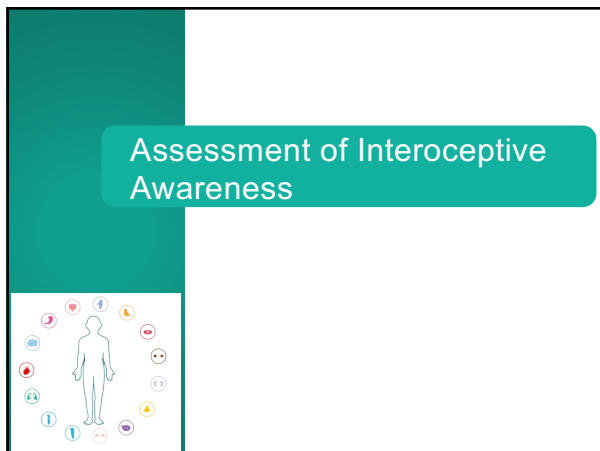
A Breakdown in Noticing: Unreliable, missing or noisy body signals.
"Before working on interoception, my anxiety seemed to come out of nowhere. I didn't feel it coming. All of a sudden, I would be overcome with anxiety—screaming, shaking, crying. And then people would say things to me like "make a smart choice" or "use your words". Don't you think I would if I could?!?"

A Breakdown in Connecting: Confusion over meaning of body signals
"I noticed feelings in my body, but didn't understand what they meant. I'll never forget when I figured out the buzzing feeling in my body and my blurry feeling eyes were an early sign of auditory overwhelm. Once I made that connection, it helped me to get my headphones on sooner and tell my partner that we need to leave—like now."

A Breakdown in Regulating: You know how you feel, but missed valuable opportunities to learn what is regulating.
"When someone would tell me to take a break, I had no idea what to do during the break. I had no idea what things helped me feel good. Calm was just a word that had no meaning to me—that word had no meaning in my body. So, I would just sit there or even worse refuse the break and the staff would get mad at me."

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A Widespread Debate *What is the Best Way to Measure Interoception?*

Main Categories of Assessments

- Objective Measures:
 - Heartbeat Detection Tasks (tracking or discrimination)
 - Respiratory Tasks (e.g., inspiration resistance Garfinkle et al, 2016)
- Self-Report:
 - Porges Body Perception Questionnaire (BPQ; Porges, 1993)*
 - Multidimensional Assessment of Interoceptive Awareness-Version 2 (MAIA-2; Mehling, et al, 2018)*
 - The Comprehensive Assessment of Interoceptive Awareness (Mahler, 2016)
- Observation-based/ Caregiver Report:
 - The Comprehensive Assessment of Interoceptive Awareness (Mahler, 2016)
 - Observations of Interoception Experience (Mahler, 2014)

*Open Access (free)

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Assessment of IA

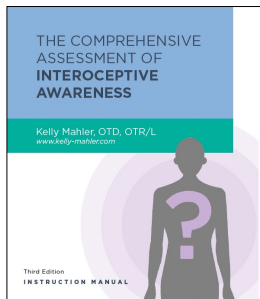
The **main goal** of interoception assessment is to **gain deeper insights into a person's internal experience** which can in turn be used to provide more **meaningful supports**

Interoception assessment is **not** about right/wrong or above average/below average



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Comprehensive Assessment of Interoceptive Awareness-3rd Edition



3 Sub-Assessments:

1. The Interoceptive Awareness Interview
2. The Assessment of Self-Regulation
3. The Caregiver Questionnaire for Interoceptive Awareness

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The Interoceptive Awareness Interview

THE INTEROCEPTIVE AWARENESS INTERVIEW

Lessee's Name: _____ Date of Birth: _____ Sex: _____
 Assessor's Name: _____ Occasion: _____ Date: _____

SECTION I

SECTION QUESTIONS	ANSWERS
AFFECTIVE ENGAGEMENT	
1. How does your body feel when you are relaxed/calm? <small>How do you know when you are relaxed/calm? What makes you feel relaxed/calm? How does your body feel when you are doing (insert an answer from the previous question)? What does the word relaxed/calm mean to you? Will you please draw what relaxed means or how it feels to you?</small>	
2. How does your body feel when you are hungry? <small>How do you know when you are hungry? How do you ever go for long periods of time without eating? If yes, how does your body feel? Do other people need to remind you to eat? If yes, why do you think that is?</small>	
3. How does your body feel when you are angry? <small>How do you know when you are angry? How do you ever go for long periods of time without eating? If yes, how does your body feel? Do other people need to remind you to eat? If yes, why do you think that is?</small>	
4. How does your body feel when you are a little angry? <small>How do you know when you are a little angry? How do you ever go for long periods of time without eating? If yes, how does your body feel? Do other people need to remind you to eat? If yes, why do you think that is?</small>	

Informal Question & Answer Format (mix of open-ended & Likert Scale):

- 20 Main Questions
- 10 Likert Scale Questions

Only a Guide; not standardized

Ages 4ish+

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The Interoceptive Awareness Interview

Sample Open-Ended Questions:

Main Question: How does your body feel when you are relaxed?

Follow-up Questions or Prompts: How do you know when you are relaxed/calm? What makes you feel relaxed/calm? How does your body feel when you are doing (insert an answer from the previous question)? What does the word relaxed/calm mean to you? Will you please draw what relaxed means or how it feels to you?

Main Question: How does your body feel when you are hungry?

Follow-up Questions: How do you know when you are hungry? Do you ever go for long periods of time without eating? If yes, how does your body feel? Do other people need to remind you to eat? If yes, why do you think that is?

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Aware vs. Unaware Responses


Aware	Unaware
"My heart beats faster"	"I don't know"
"I feel my neck pulse"	"When I feel bad"
"My hands clench"	"When I hit someone"
"My muscles get tense"	"When I throw something"
"My face gets warm"	"Angry"
"My toes start to curl and get tight"	"I feel mad"

Optional: Total the # of Aware Responses to serve as baseline

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The Interoceptive Awareness Interview

Adaptations:



Adapting Method of Responses:

- Provide paper and writing tools
- Point to their own body/act out
- Use AAC
- Allow plenty of time for learner to respond

Questions:

- Write questions on paper
- Make question cards and turn it into a game

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The Interoceptive Awareness Interview

THE INTEROCEPTIVE AWARENESS INTERVIEW

Learner's Name: _____ Date of Birth: _____ Age: _____
 Assessor's Name: _____ Discipline: _____ Date: _____

SECTION I




SECTION QUESTIONS	ANSWERS
1. How does your body feel when you are interested? 1. How does your body feel when you are interested? 2. How does your body feel when you are interested? 3. How does your body feel when you are interested? 4. How does your body feel when you are interested?	
2. How does your body feel when you are excited? 1. How does your body feel when you are excited? 2. How does your body feel when you are excited? 3. How does your body feel when you are excited? 4. How does your body feel when you are excited?	
3. How does your body feel when you are angry? 1. How does your body feel when you are angry? 2. How does your body feel when you are angry? 3. How does your body feel when you are angry? 4. How does your body feel when you are angry?	
4. How does your body feel when you are a little angry? 1. How does your body feel when you are a little angry? 2. How does your body feel when you are a little angry? 3. How does your body feel when you are a little angry? 4. How does your body feel when you are a little angry?	

Where you can start without the assessment

Get curious and ask questions about their inner experience. Dig deep, if possible.

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The Assessment of Self Regulation

Sleepy
Pain
Sad
Frustrated
Sick
Scared

Excited
Cold
Hot
Happy
Scared
Relaxed

12 Homeostatic and Affective Emotions

- ✓ Examines the understanding & inner experience surrounding self-regulation
- ✓ Series of 12 pictures each with corresponding questions

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The Caregiver Questionnaire for IA

- ✓ Caregiver Completes
- ✓ 70 Questions (combo Likert Scale plus area for examples/insights)
- ✓ Circle the questions that apply to the learner
- ✓ Helpful guide for caregiver interview

The Caregiver Questionnaire for IA

Where you can start without the assessment

Signs of IA Extremes
(not exhaustive nor prescriptive)

- ✓ Bowel/bladder leakage or frequent bathroom trips
- ✓ Intense/muted response to changes in body temperature
- ✓ Not seeking out food/drink
- ✓ Over-eating
- ✓ Intense/muted response to feelings of injury/illness (or only when it is very significant)
- ✓ Intense/muted response to feelings of fatigue/sleep
- ✓ Meltdowns or Shutdowns
- ✓ Not seeking out coping strategies when needed
- ✓ Emotions seem to go from 1-100 in a split second
- ✓ Difficulty sharing how they feel
- ✓ Emotion words have little meaning
- ✓ Easily dysregulated when others are dysregulated
- ✓ Can't tell you what is wrong

Interoception-Based Supports

Interoception-Based Supports

Adaptations for IA

My Interoception Workbook

The Interoception Curriculum

THE INTEROCEPTION ACTIVITY CARDS

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IA Builders as Continued Assessment

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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

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The *Established* Evidence




Why traditional body mindfulness may not work:

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

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What are Interoception-Based Supports?

 IA Builders: *Adapted forms of Body Mindfulness*

- Chunked into 1 body part
- Evoked a stronger sensation that draws attention
- Learning while experiencing (real time learning)
- 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	Scorching	Fast
Slimy	Sweaty	Dry
Mossy	Clean	Sores

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The Interoception Curriculum

www.kelly-mahler.com

Section 1: Body
Lessons 1-16

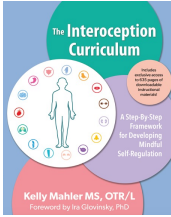
Build the learner's ability to **NOTICE** body signals in a concrete and slow method

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**



**BODY
EMOTION
ACTION**

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Section 1: BODY
Focus on one body part a week/month

 <p>Outside</p> <ol style="list-style-type: none"> 1. Hands & Fingers 2. Feet & Toes 3. Mouth 4. Eyes 5. Ears 6. Nose 7. Voice 8. Cheeks 9. Skin 	 <p>Inside</p> <ol style="list-style-type: none"> 10. Muscles 11. Lungs 12. Heart 13. Brain & Head 14. Stomach 15. Bladder
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Section 1: BODY

The Fantastic Four IA Builders

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

Repeated throughout the curriculum to create a predictable process


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IA Builder: Focus Area Experiments


Activities that playfully evoke a stronger sensation in a specific body part to give practice:

- Noticing how that body part feels
- Describing how that body part feels


Also help to give concrete meaning to body sensations




1




2




3




4



5



6

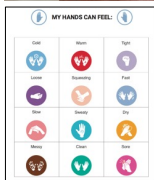


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Interoception-Informed Responding:

- Invite participation
- Encourage curiosity
- Validate all responses, even when it is against what you might expect
- Never correct or label the child's experience
- Support language:
 - thru descriptor menu
 - alternative forms of communication,
 - comfortable/uncomfortable (thumbs up/thumbs down; more/stop)



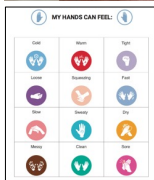
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Notes:

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

Tactile: how does the ice cube feel?



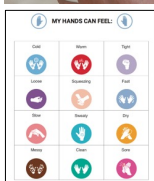
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Notes:

Implicit: assume connection will be made and the child will naturally learn about their body sensations

Explicit: actively teaching, discussing and learning about the child's body sensations; helping them put it together in a way that empowers self-regulation; asking questions to gain insight



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IA Builder: Everyday Focus Area Experiments

Free:
www.kelly-mahler.com

HANDS										
Coming outside in hot/cold weather	Eating finger foods	Chasing with toys/playdough	Clapping	Playing in snow/can	Washing hands	Changing in monkey bars	Climbing on playground equipment			
Using a comb/brush or hairband	Wiping eyes on paper	Typing	Washing dishes	Holding a water/can drink	Catching a ball	Carrying a heavy load	Putting on hand lotion			

FEET										
In the bath/shower	Walking/rolling feet on carpet	Walking/rolling feet in grass	Walking on a wooden beam	Standing on one foot	Walking a ball	Jumping off a trampoline	Climbing on playground equipment			
Coming outside in hot/cold weather	Rolling on the couch or chair	Putting on socks/shoes	Walking on socks/shoes	During a foot tickle	Walking on a hot day	Carrying a heavy load	Putting lotion on feet			

MOUTH										
Brushing teeth	Taking a sip of hot water	Taking a sip of warm tea	Eating a meal	Humming with mouth open	Chewing gum	Blowing bubbles	Blowing up a balloon			
Eating a crunchy snack	Eating soup	Eating a chewy snack	Putting on Chapstick	Eating a popsicle	Humming a song	Whispering with napkin	Tracking an ice cube			

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Embedding interoception curiosity in sessions:

How does your body feel on the swing?

- Different speeds
- Different positions
- Different swings
- Zoom in on one body part-how do your hands feel? Eyes? Feet? Stomach?
- Teach concept of comfortable vs uncomfortable (more or stop; thumbs up or thumbs down)
- What can you do on the swing to change the way your body feels right now?


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Assessment concepts:

- Learn a lot about the child's inner experience (especially by explicit inquiry whenever possible)
- How do they respond to certain experiments? Which are they drawn to? What do they avoid?
- What makes their body comfortable/uncomfortable?
- How can you best support their ability to share their inner experience with others?
- How to use what you learn to educate others about having fair expectations?

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 **THANK YOU!!**

FOR MORE INFORMATION:

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



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