

Interoception

How we feel from the inside





Australian Government

Department of Education, Skills and Employment

This initiative is funded by the Australian Government Department of Education, Skills and Employment through the Helping Children with Autism package. The views expressed within this website do not necessarily represent the views of the Australian Government or the Australian Government Department of Education, Skills and Employment.

Positive Partnerships is delivered by Autism Spectrum Australia (Aspect).

This work is licensed under a Creative Commons Attribution 4.0 International License. Copyright Australian Government Department of Education, Skills and Employment



Positive Partnerships is an initiative funded by the Government Dept of Education, Skills and Employment through the 'Helping children with autism' package.

All content and resources are licensed under a creative commons licence unless otherwise stated. For further information on creative commons licence, please visit our website homepage.

All content and resources are copyright of the Australian government unless otherwise stated.

Positive Partnerships is delivered by Autism Spectrum Australia (Aspect) on behalf of the Government.

Session intentions

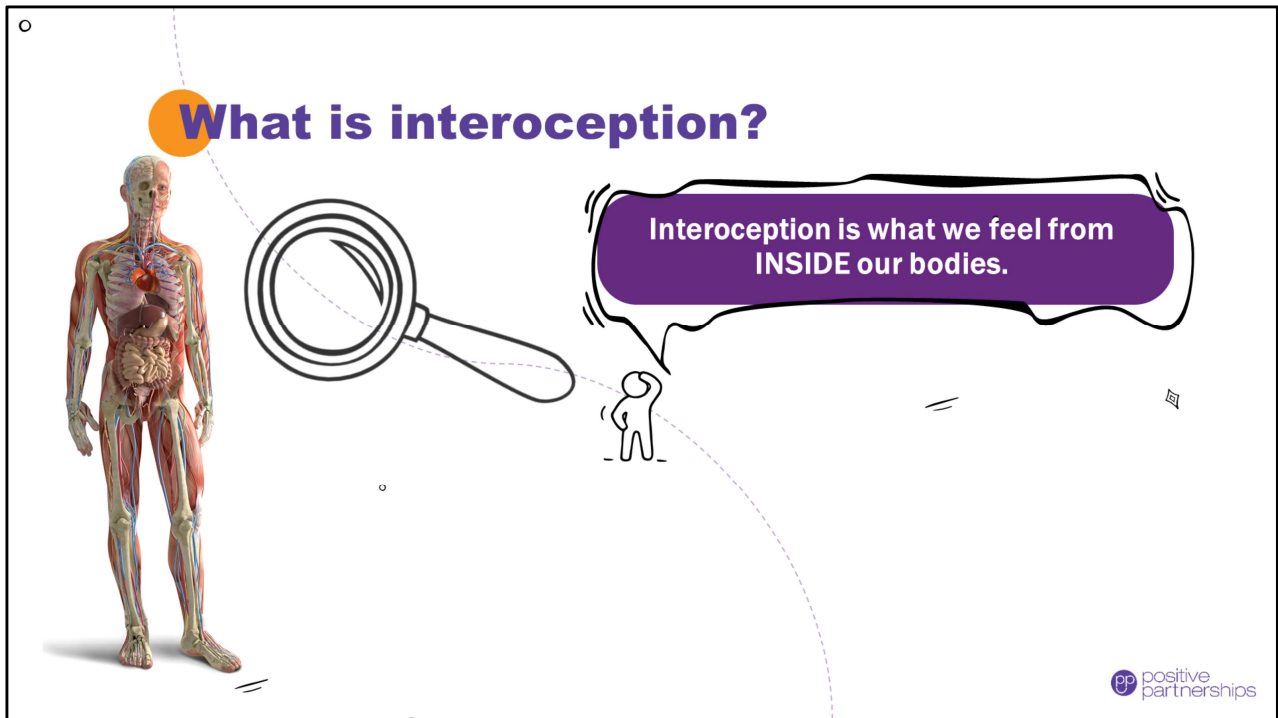
To develop an understanding of what interoception is.

To explore interoception in autism and other diverse individuals.

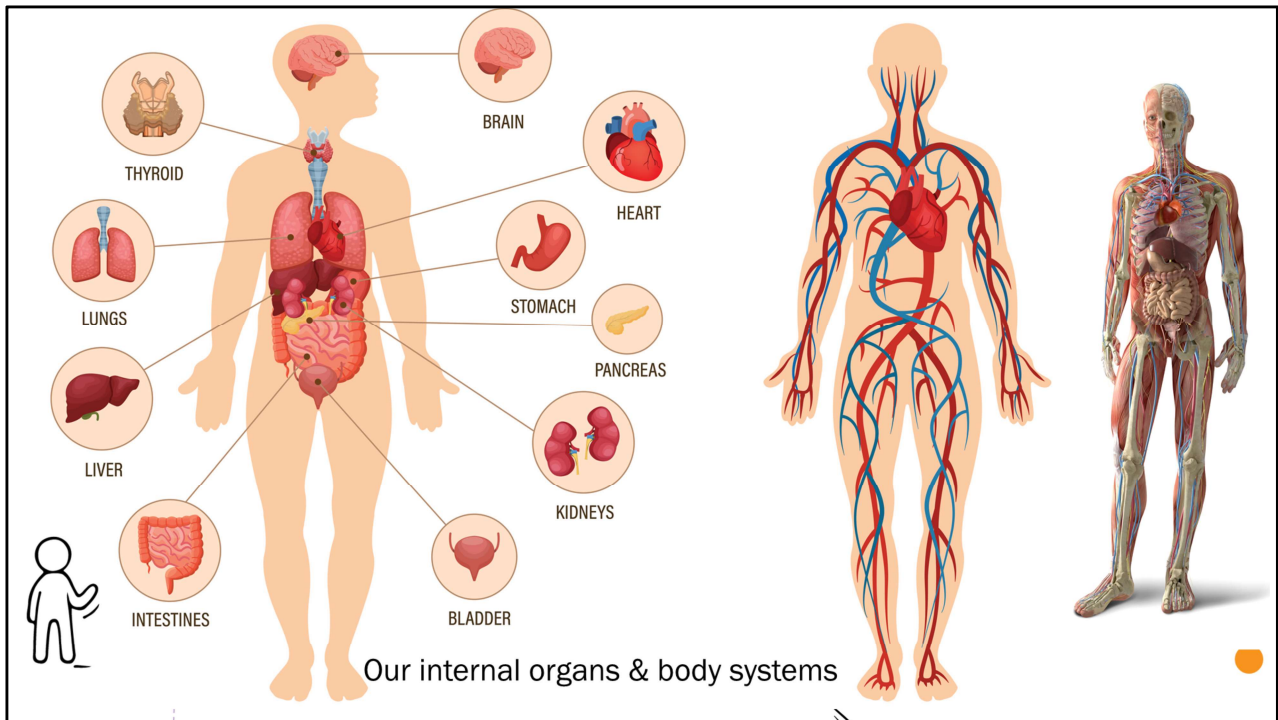
To look at how we can help individuals improve their interoception and why.



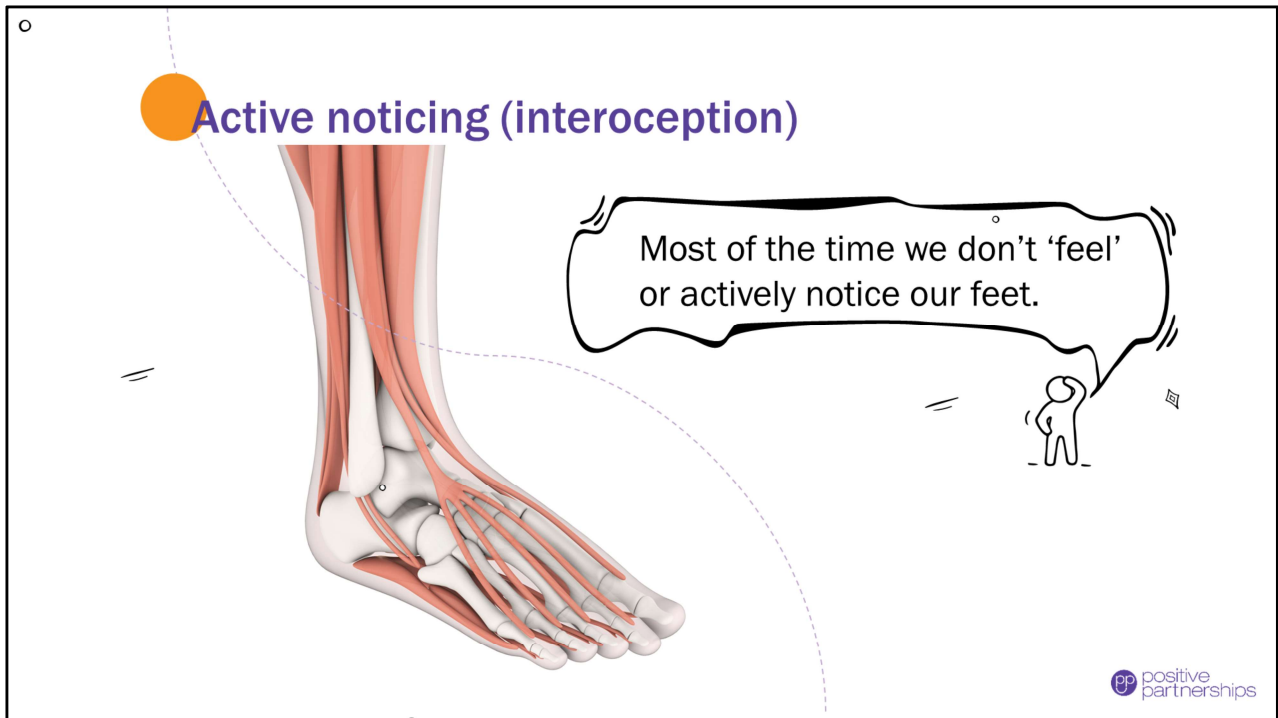
During this session you will develop and understanding or what interoception in and explore how interoception relates to autism and other diverse individuals. We will then look at some practical strategies to help individuals improve their interoception and discuss why that might be useful.



Interoception is where we actively sense or feel our internal body signals and interpret what these mean. There are other names for interoception such as mindful body awareness or biofeedback. The word interoception comes from the Latin words for internal perception or perception of our internal self. When we have good interoception we are connected to ourselves, which makes it easier to connect to others.

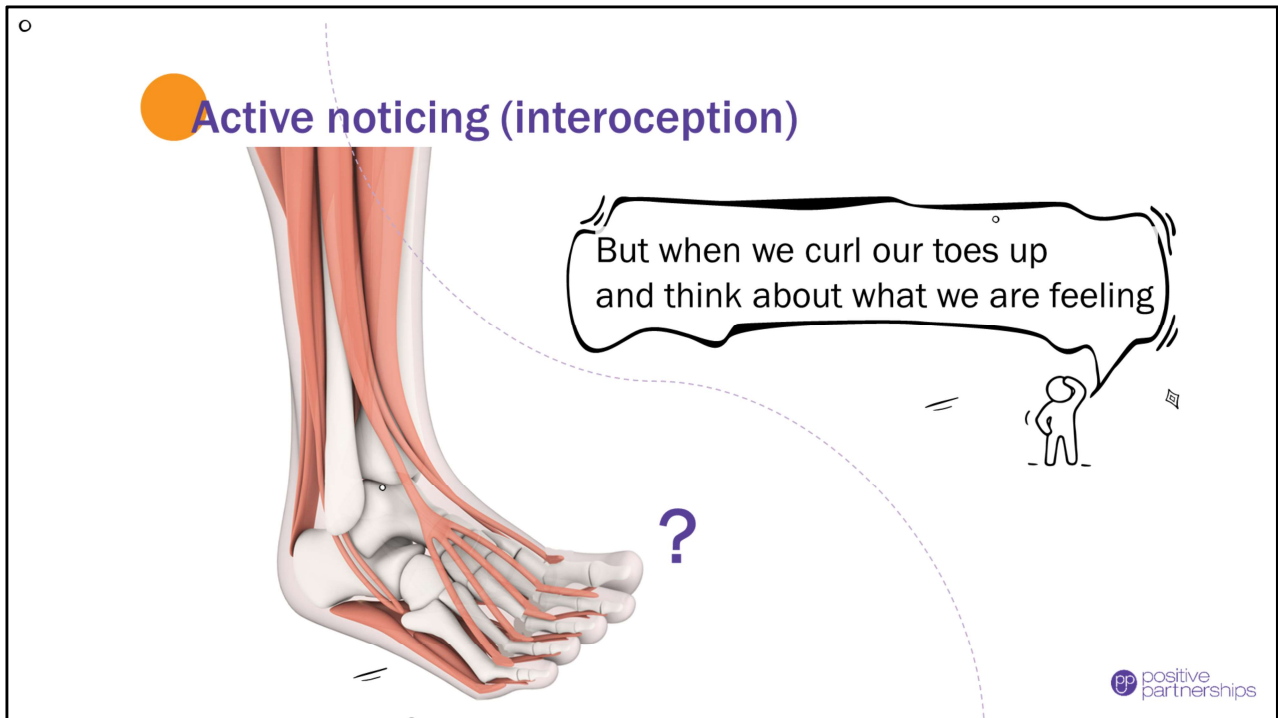


Internal body signals come from our internal organs and body systems, including our hormones and nervous systems. We experience many more of these signals that we actively notice, much in the same way that our ears take in much more sound than we actively process in our brain. However, if we don't notice and process these internal body signals in our brain, we won't feel those feelings or emotions, which means that we won't respond to what our body needs or wants.



Interoception relies on our active or conscious noticing of our internal body signals. Let's have an experiment. Before this slide came up were you aware of how your feet were feeling? Most of the time we don't really notice our feet, unless we have some sort of pain or they are aching.

Type in the chat box if you were feeling your feet prior to this slide.



Now try curling your toes up to touch the top of your shoes if you have shoes on. If you are in socks or have bare feet, curl your toes up as high as you can. This may hurt, but if it does, don't worry it will stop hurting when we relax our toes again. Hold the toe curl for a little bit longer and really focus on where you can feel your muscles in your toes, feet and even legs. And now relax.

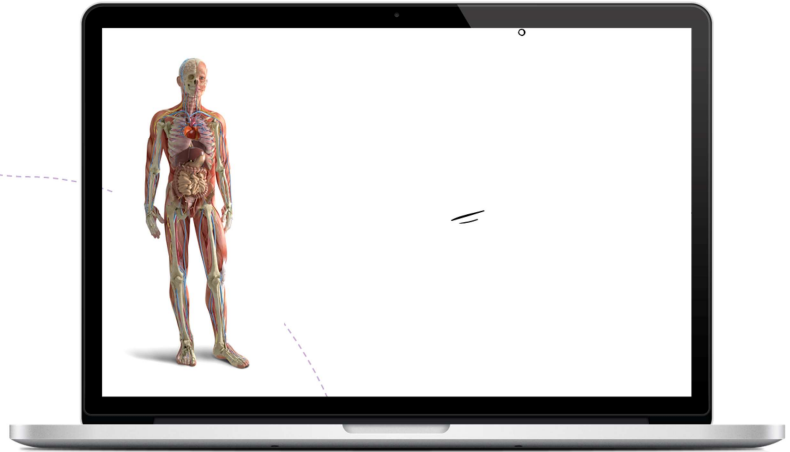
Note where you felt your muscles.

Great, thanks, you can see there were lots of different places..... This is because we are all individual and there are no right and no wrong responses.

We are going to try the toe curl again but this time we are all going to focus on our big toes. Ok, let's curl and hold. If you can't feel your big toes, try adjusting your toe curl until you can. Hold and focus.

And relax. Who felt that more in their big toe this time? This is an example of interoception or mindful body awareness.

What is interoception

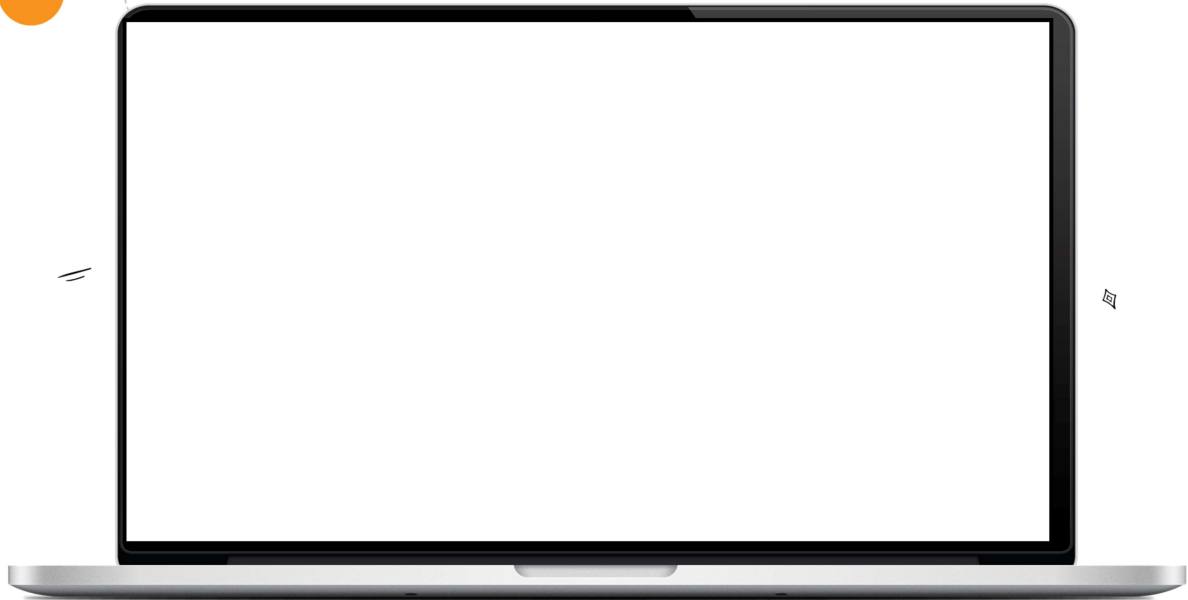


pp positive
partnerships

We are now going to watch a short explainer video about interoception.

o

What is interoception

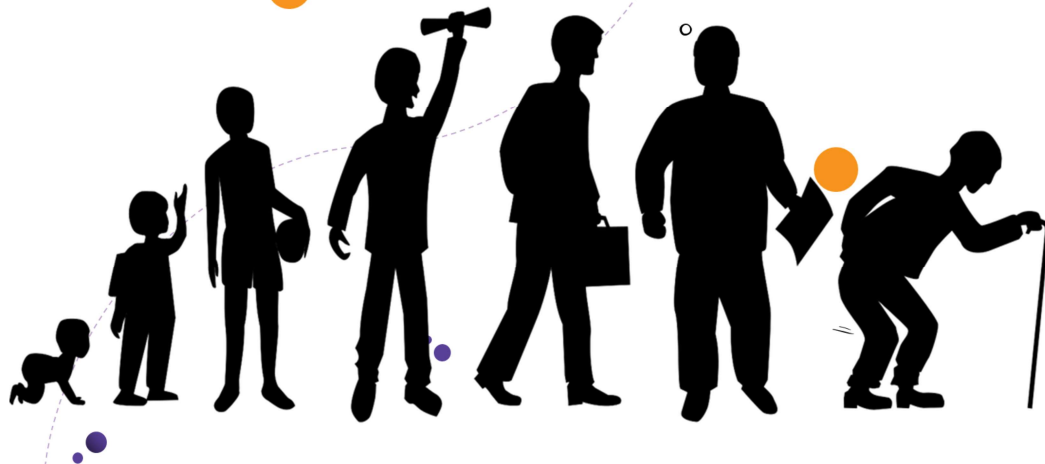


Video will be available in the resources section of the interoception webpage on the Positive Partnerships web site.

After the video:

Consider your own interoception, do you know when you are starting to get cross, or only recognise the emotion, once you are already quite angry?

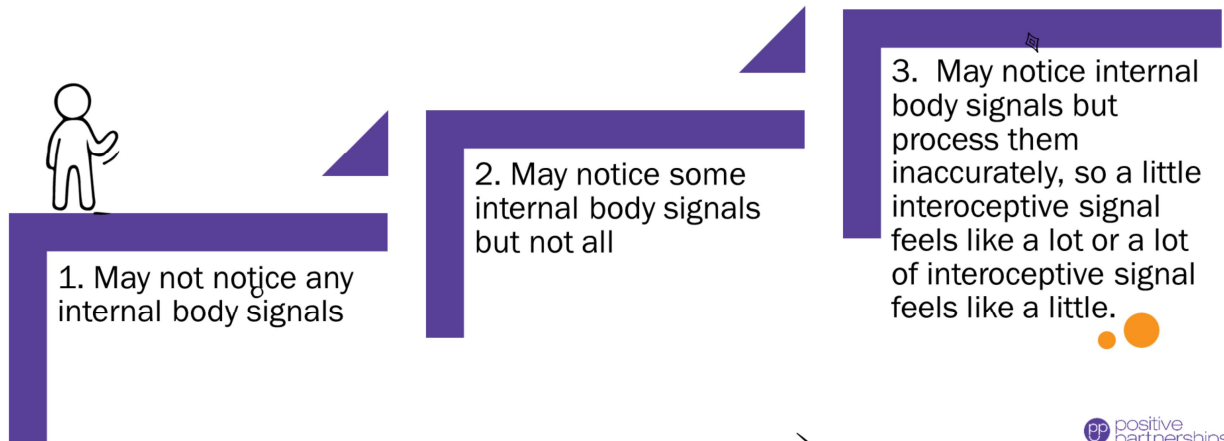
Interoception & autism



Research has indicated that interoception develops over time from birth, but this development can be slowed or halted or even reversed. In these cases, the interoception can be said to be atypical. In children and young people on the autism spectrum interoception is known to be atypical.

Interoception development is halted or even reversed by significant trauma. Intergenerational trauma, neurodevelopmental and mental health conditions and neurodiverse conditions, such as ADHD, depression and anxiety can all significantly affect the development of interoception.

What atypical interoception means



Atypical interoception can be broken down into three main areas of difference;

Where no internal body signals are either noticed or recognised

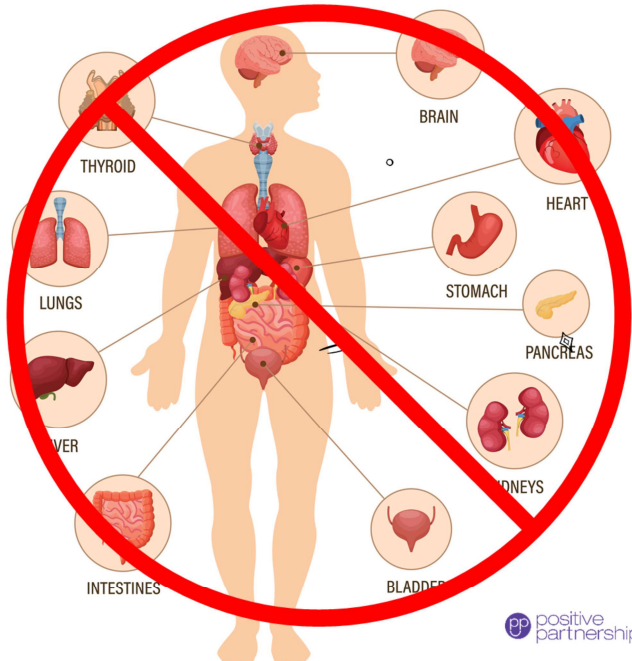
Where some but not all internal body signals are noticed and recognised

Where all internal body signals are noticed and recognised, but are not interpreted accurately

No interoception



1. May not notice any internal body signals

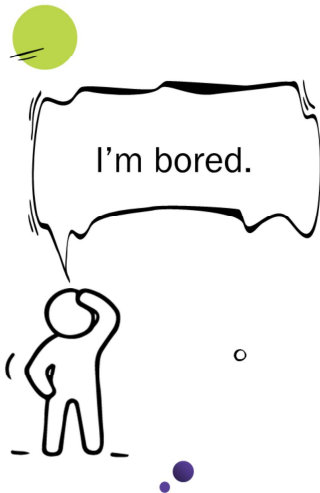


pp positive partnerships

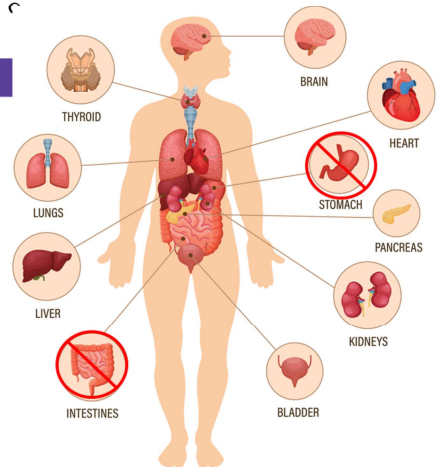
When you don't notice any of your internal body signals, you won't be aware of your feelings or emotions until they are so big that everyone around knows about it! For example, you won't know you need to go to the toilet until you are literally about to go, know when you are hungry or full, know when you are unwell. Then when you do notice you need the toilet, you have to run there as quick as possible, often during the middle of class or at an inconvenient time out with the family. Also, you may act really grumpy when you are unwell, not knowing that you are unwell.

Children and young people with no interoceptive awareness can struggle to feel any internal body signals. To compensate for this, they may seek out externally created biofeedback. For some this may be hitting or kicking, which provides good levels of biofeedback on the hands or feet. For others, even this biofeedback is not strong enough to notice, and they may engage in head banging, which provides biofeedback to the head, or even throwing their whole body a the wall or floor for extreme and widespread external biofeedback.

Some interoception



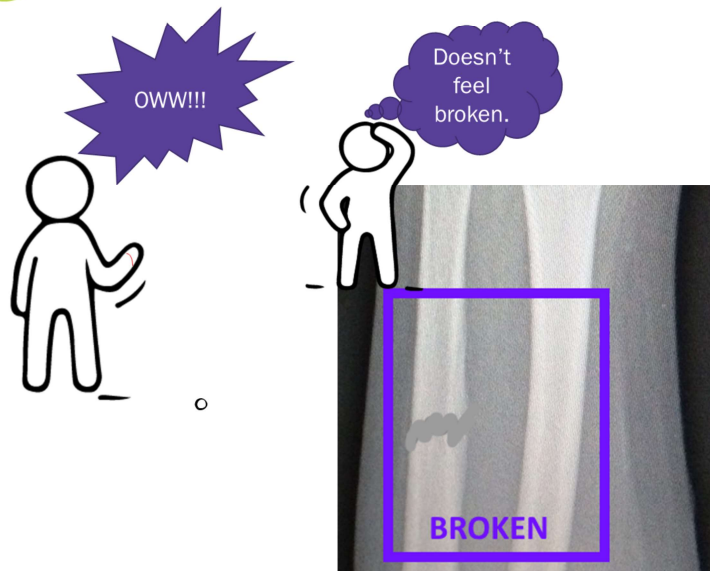
2. May notice some internal body signals but not all



If you can't feel your stomach or your intestines, you may not know when you are hungry or full, so you may think you are bored, but really you are hungry.

Where a student is not noticing stomach and intestinal signals, this can present in a variety of ways. For example, the student may say they are bored when they are in fact hungry or even full. Alternatively or additionally, the student may run out of class without asking as they only realised right then that they needed to go to the toilet immediately. This is particularly problematic in older students where there is an expectation that they can wait until recess or lunch to go to the toilet, and their leaving class without permission 5 minutes after a break is perceived as work avoidance. This student would not have known they needed to go to the toilet soon during the break.

Inaccurate interoception

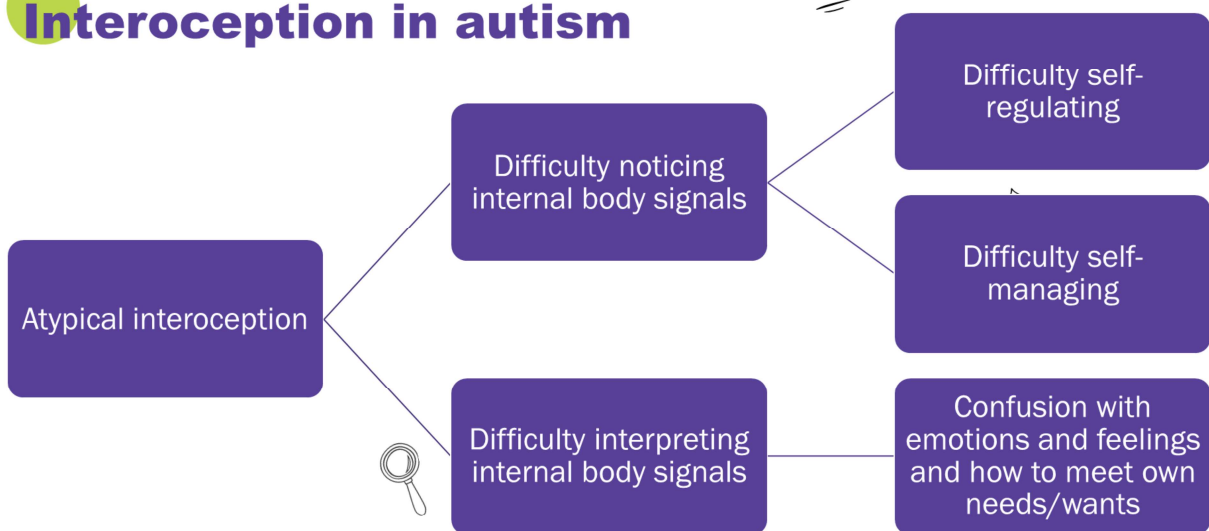


3. May notice internal body signals but process them inaccurately, so a *little* interoceptive signal feels like a *lot* or a *lot* of interoceptive signal feels like a *little*.

This is an example of inaccurate interoception in pain responses. If someone is over sensitive to their internal pain signals, they may feel a little bruise or cut as excruciating pain. If, on the other hand a they are under sensitive to the internal pain signals, they may not notice if they break their arm when playing. You can be both under and over sensitive to internal body signals, in the same way as for other senses. Context, such as being tired or overwhelmed exacerbates interoceptive difficulties.

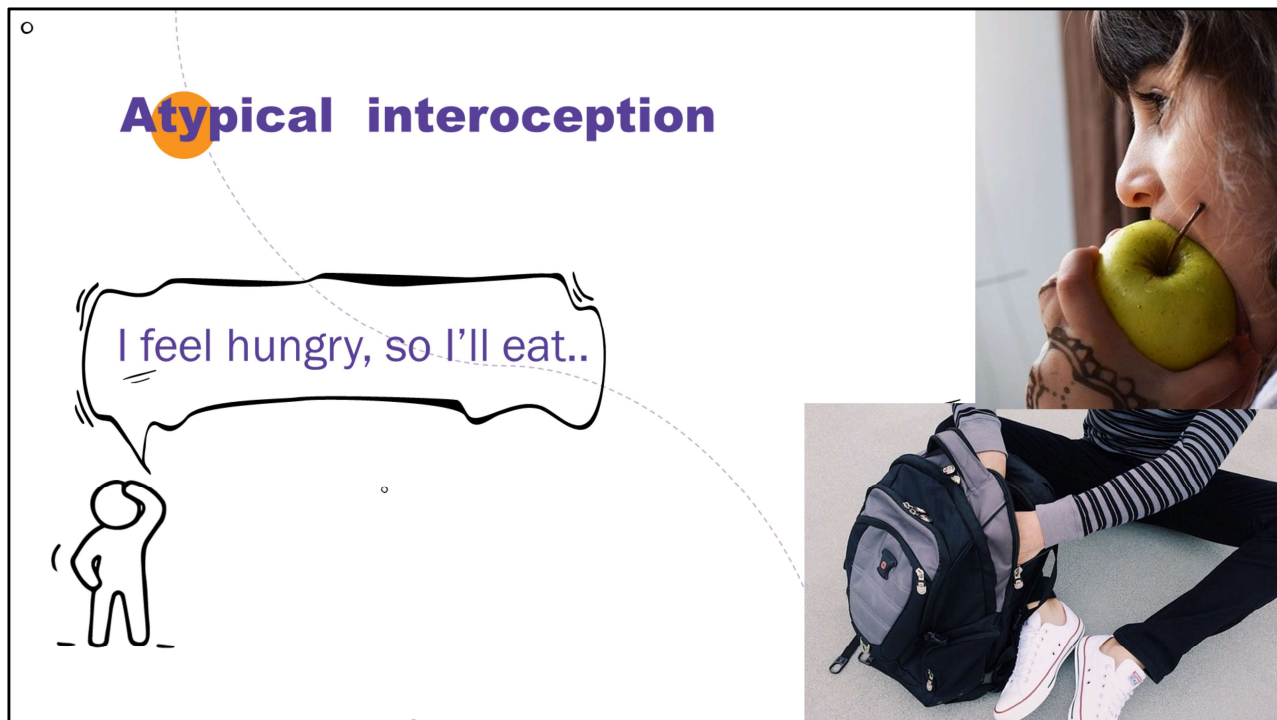
If you think about yourself, when you have flu, you may feel extremely unwell even though people around suggest that you are only slightly ill. Another example, is when students are tired or unwell, but are not aware of that. They may present as grumpy or rude, when in actuality their body is trying to signal to them that they need to rest.

Interoception in autism



Interoception is atypical in many individuals, for example those with trauma, intergenerational trauma and also for many autistics. If your child has difficulty with noticing and responding age appropriately to their internal body signals, this may indicate interoception difficulties. If your child struggles to self-manage age appropriately, so for example aged 9; is unaware when they are going to need the toilet, and only knows they need to go just as they are about to, will not put their sweater on, nor be aware that they are cold even when their hands and feet are blue and they are shivering, this again may be a sign of atypical interoception.

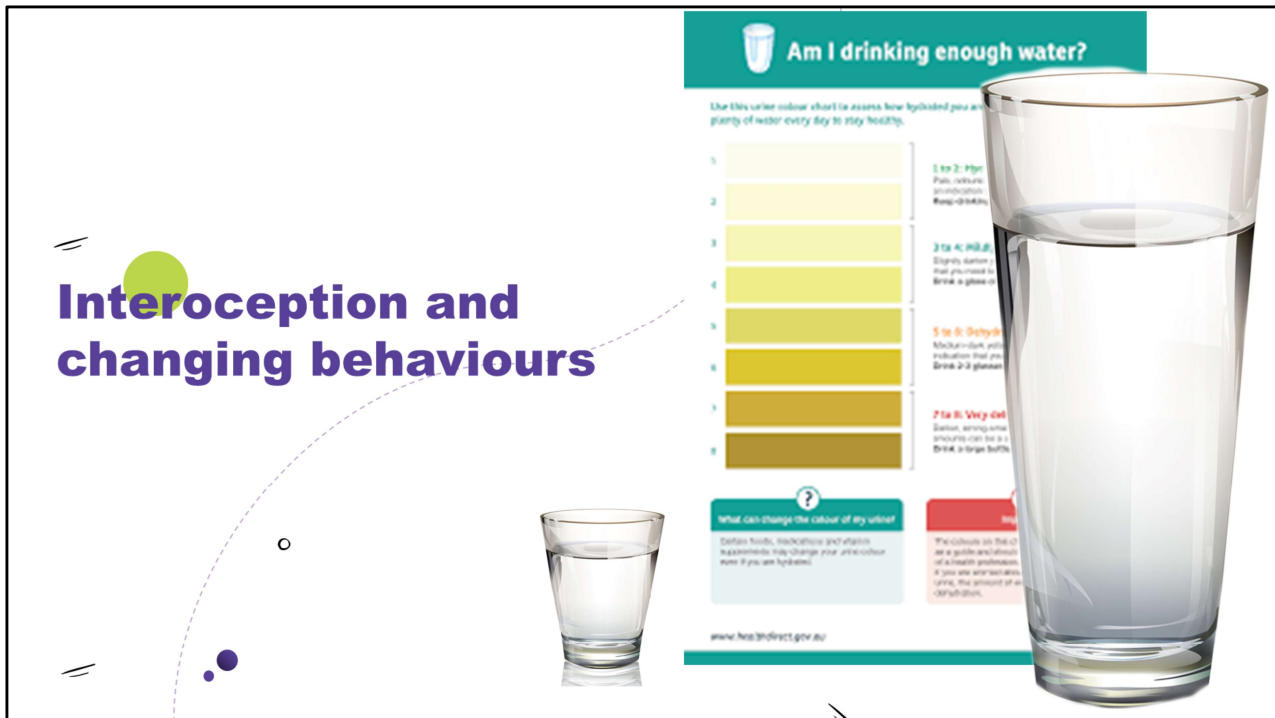
On the other hand if your child or young person says they are bored in response to all situations and contexts, or alternatively that they are angry all the time, even when appearing relaxed and happy, this can also hint at interoception difficulties.



We act on our feelings and emotions, so having a mismatch between what our body signals are trying to tell us and what we interpret means that our behaviours may not enable us to meet our needs. In addition, this means some behaviours may be problematic for the individual themselves or for people around.

For example, if you think you are hungry, but your body is trying to signal that you are frustrated with trying to get your school bag packed, once you eat, you may still be frustrated with the school bag. It is likely that frustration will continue to build until it is addressed, and if it is not addressed, may grow into rage. Then you may throw your bag across the room. You were trying (unsuccessfully) to self-regulate by eating, as they thought they were hungry. If someone had seen you, they might have realised you were frustrated and co-regulated by holding the bag open to enable the person to put the items in easily.

Co-regulation is when people around support the individual to express their needs and wants helpfully. In this case the parent might have noticed that the child's shoulders were tense and their eyes tense, and assumed they were frustrated with the bag. The holding the bag open, eased the frustration and this co-regulated the child.

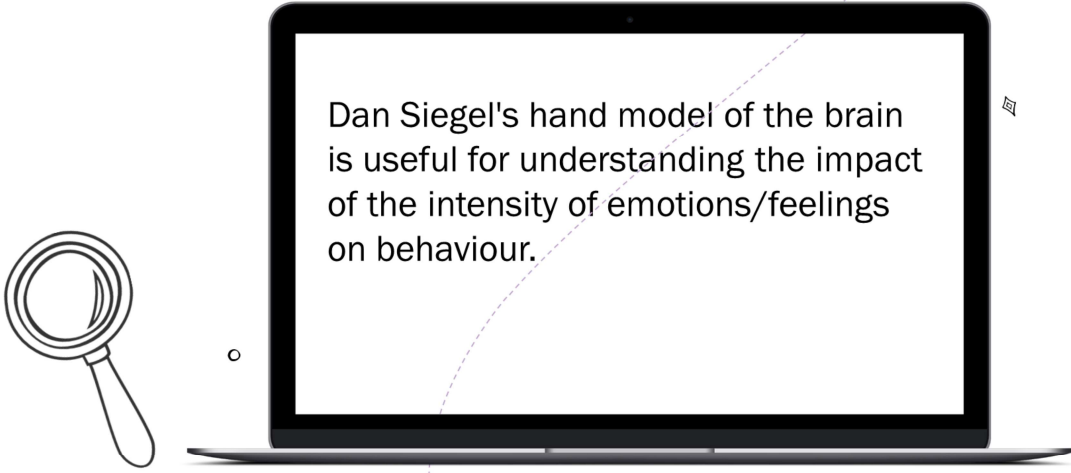


As a feeling or emotion emerges, the body signals intensify until they are ‘taken notice of’. If we take thirst as example. When an individual’s body needs water, the body signals thirst in a number of different ways. If the person doesn’t notice or respond to the thirst signal, their sense of dryness in the throat may get more intense, they may then get a headache, and then further body signals involving multiple organs.

If the person had a drink of water initially, they may have just had a few sips or a small glass. By the time they have a headache, they may gulp a large amount of water. This is an example of how more intense or extreme feelings and emotions can result in more extreme responses or behaviours. If we can help individuals to connect to what they are feeling, then they can prevent extremes of emotions or feelings from building up.

A urine or hydration chart may help individuals who struggle to feel, notice or process sensations of thirst to effectively manage their hydration. Some individuals will also benefit from being supported to use a Bristol stool chart as dehydration can impact bowel health and constipation. Both constipation and chronic dehydration are linked to challenging behaviours. (Goodall, 2016)

Intensity of emotions/feelings

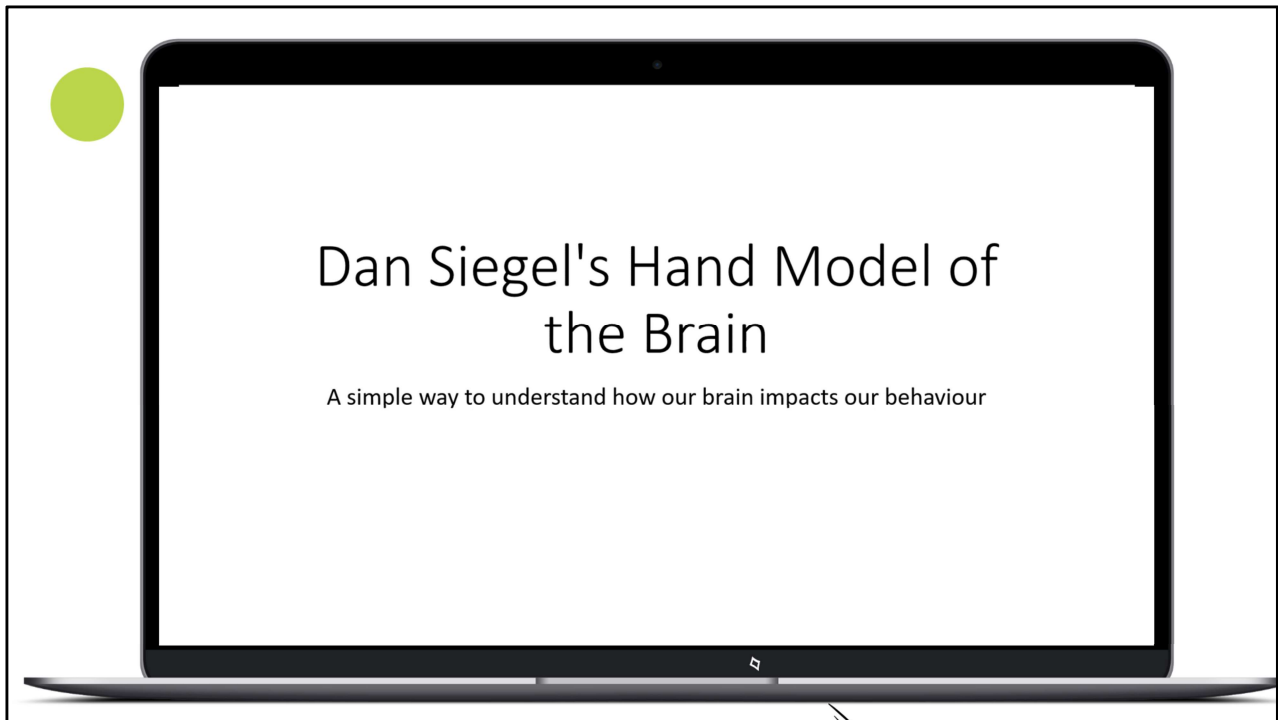


Dan Siegel's hand model of the brain is useful for understanding the impact of the intensity of emotions/feelings on behaviour.

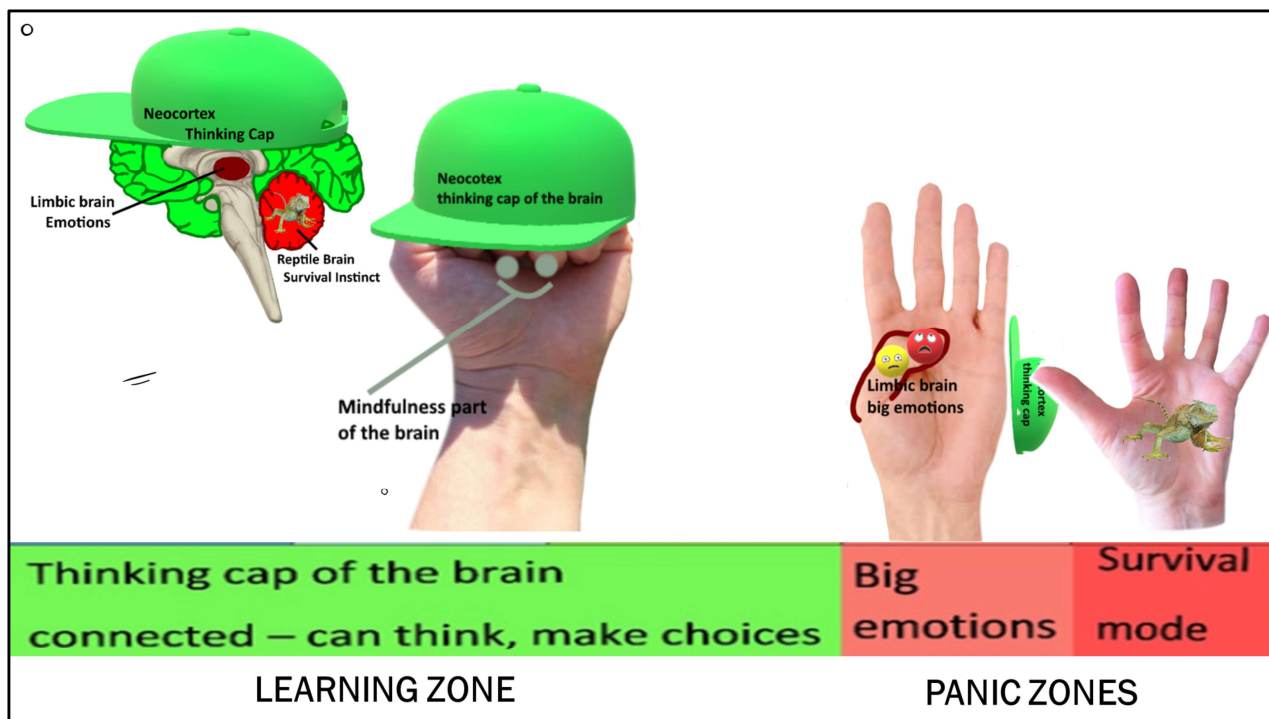
pp positive partnerships

When our emotions are extremely intense or extreme, we lose our ability to process information and choose how to respond. When we are well connected to our internal body signals, we can choose how to respond more often and more quickly.

We are now going to watch a short video explaining Dan Siegal's hand model of the brain.



Demonstrate and model of the brain live after the video. Video will be available in the resources section of the interoception webpage on the Positive Partnerships web site.



As we saw in the explainer videos, the hand model of the brain can be linked to zones of learning or regulation. In panic zones individuals cannot make choices and are not in control of their behaviour. Children and young people can be co-regulated when they are in either the learning zone or experiencing and expressing big emotions. Co-regulation is when the a person is supported to express themselves safely or helpfully.

For example, teachers often co-regulate students who are getting frustrated with their work by offering support or prompting the student to take a break. Parents often give cuddles to help co-regulate children who are starting to get distressed. Individuals cannot be co-regulated when they are in survival mode.

Think about the ways you co-regulate your child/student.

Improving interoception

- If individuals practice mindfully noticing changes in their internal body they are able to improve their interoception
- It is much easier to notice internal body signals where the body is changing in some way
- By repeatedly being guided to connect to our bodies, over time we can do some more effectively



If individuals practice mindfully noticing changes in their internal body they are able to improve their interoception, which can lead to increased ability to be co-regulated and to self-regulate.

It is much easier to notice internal body signals where the body is changing in some way, rather than when there is no obvious change.

By repeatedly being guided to connect to our bodies, over time we can connect to our internal body signals more effectively

What is an interoception activity?

1. Focus on a body part or state for 30 or more seconds
2. Move that body part or change the state of the body and focus on that change for 30 or more seconds
3. Think about and demonstrate (point or say) where you noticed an internal body signal.
4. Repeat steps 1-2, this time focus on a particular sensation (as guided by one of the group/the teacher)

An interoception activity is one that guides the noticing of one or more body state changes. These could be in the area of temperature, muscle tension, heart rate or breathing. In order to ensure the conscious noticing, these four steps are needed.

1. Focus on a body part or state for 30 or more seconds
2. Move that body part or change the state of the body and focus on that change for 30 or more seconds
3. Think about and demonstrate (point or say) where you noticed an internal body signal.
4. Repeat steps 1-2, this time focus on a particular sensation (as guided by one of the group/the teacher)

Walking interoception activity



We are now going to do an interoception activity together. If you can stand, please now stand up and with your feet flat on the floor just be aware of how your feet, legs, body feel. **Now walk on the spot, focusing on how that feels and where you feel your muscles.**

Now rise up onto your tiptoes and walk on the spot on your tiptoes, be aware of how your feet, legs, body feel. **Focusing on how this feels and where you feel your muscles.**

What did you feel differently between the two?

Now just walk on the spot again for a few seconds to just reset and

Rise up onto your toes and this time focus on your calves as you walk on the spot

Who felt their calves more the second time? This is your interoception – active noticing of your body signals.

Many autistic children and young people walk on their tiptoes, as do some other individuals as it provides much stronger biofeedback

Why do interoception activities?

1. They activate the mindfulness part of the brain, which helps you calm and focus
2. Over time they help you develop the level of interoception required to be able to self-regulate and self-manage
3. When you are connected to self, it is easier to connect to others and to place
4. Being connected to others and to place are protective factors for wellbeing, mental health and life outcomes

Research in South Australian schools has confirmed research from the USA undertaken with adults. Interoception activities have both immediate and longer term benefits.

In doing Interoception activities, we activate the mindfulness part of the brain, which helps us calm and focus. Over time interoception activities help us to develop the level of interoception required to be able to self-regulate and self-manage.

When we are connected to our selves, it is easier to connect to others and to place. Being connected to others and to place are protective factors for wellbeing, mental health and life outcomes.



Strategies and free resources for support

Journal articles

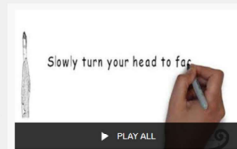
Interoception



Government of South Australia
Department for Education

On this page

[What is interoception?](#)
[Models of interoception in education and care settings](#)
[Models of interoception for in class teaching](#)
[What is an interoception activity?](#)
[Structure of an interoception activity](#)
[Interoception tools](#)
[Other neurodiversity resources to support interoception](#)
[Professional development and training](#)
[Resources](#)



Interoception activities

5 videos

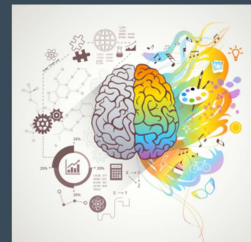
Healthy Possibilities

SUBSCRIBE



- 1 interoception neck muscles guided activity
Healthy Possibilities 2:33
- 2 guided interoception hand stretch activity
Healthy Possibilities 2:47
- 3 interoception - finger grip
Healthy Possibilities 3:31
- 4 series of animal stretches early years interoception
Healthy Possibilities 5:52
- 5 How to develop interoception
Healthy Possibilities 2:38

Ready to learn



Interoception kit

positive partnerships

Critchley, H. D., & Garfinkel, S. N. (2017). Interoception and emotion. *Current opinion in psychology*, 17, 7-14.

Garfinkel, S. N., Tiley, C., O'Keeffe, S., Harrison, N. A., Seth, A. K., & Critchley, H. D. (2016). Discrepancies between dimensions of interoception in autism: Implications for emotion and anxiety. *Biological psychology*, 114, 117-126.

Goodall, Emma. "Interoception as a proactive tool to decrease challenging behaviour." *Scan: The Journal for Educators* 39.1 (2020): 20.

Khalsa, S. S., Adolphs, R., Cameron, O. G., Critchley, H. D., Davenport, P. W., Feinstein, J. S., ... & Meuret, A. E. (2018). Interoception and mental health: a roadmap. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 3(6), 501-513.