



Emotieregulatie: waarom emotiethermometers niet altijd werken

Peter Vermeulen



1

Enkele mythes en misverstanden over emoties

(o.a. gestimuleerd door de film Inside Out van Pixar)

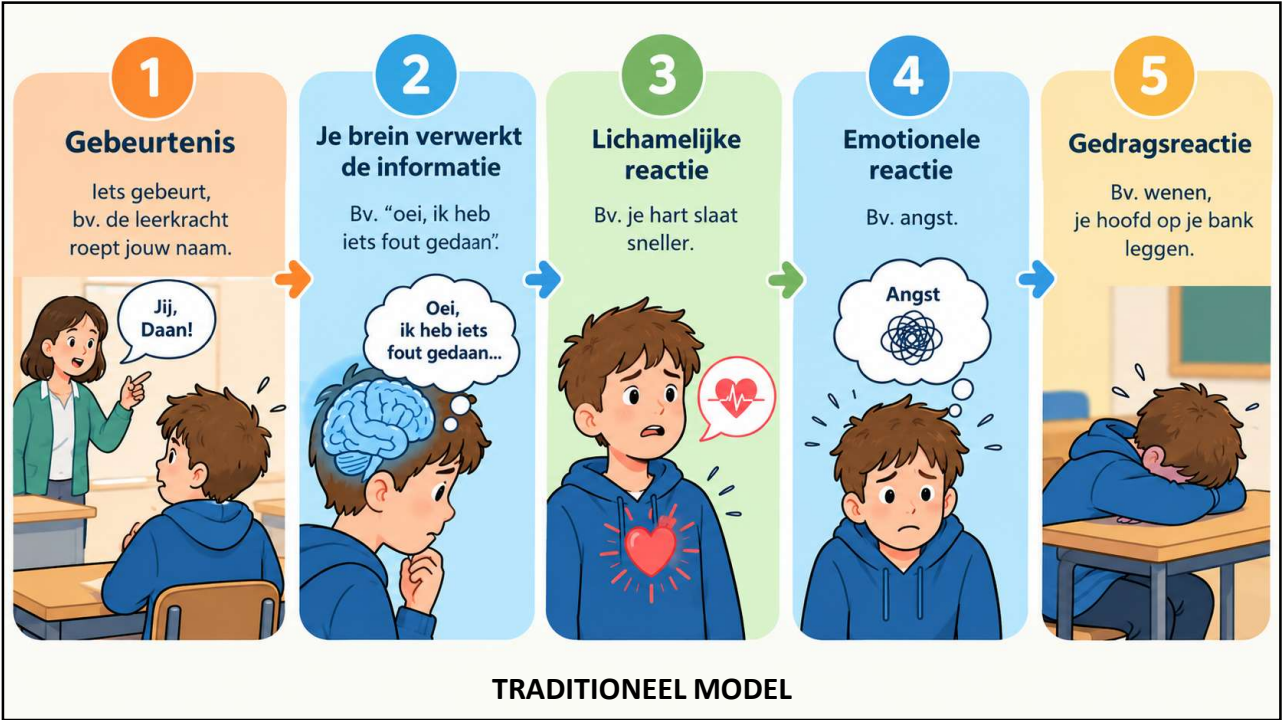
Er zijn discrete (basis)emoties met verschillende circuits → FOUT

Eén gevoel overheerst en staat aan de knoppen → FOUT

Emoties sturen ons gedrag → FOUT
(GGGG schema)



2



3

Ook een mythe: de drie breinen
En emotieregulatie = met je mensenbrein je dierenbrein en reptielenbrein controleren

Hersenen zijn niet zo geëvolueerd



Your Brain Is Not an Onion With a Tiny Reptile Inside

Joseph Cesario¹, David J. Johnson², and Heather L. Eisthen^{3,4}

¹Department of Psychology, Michigan State University; ²Department of Psychology, University of Maryland; ³Department of Integrative Biology, Michigan State University; and ⁴BEACON Center for the Study of Evolution in Action, Michigan State University

Current Directions in Psychological Science
1–6
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DOI: 10.1177/0963721420917687
www.psychologicalscience.org/CDPS
SAGE

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Emotie en cognitie werken continu samen

frontiers | Frontiers in Psychiatry

REVIEW
published: 01 April 2022
doi: 10.3389/fpsyg.2022.802608

The Brain Is Adaptive Not Triune: How the Brain Responds to Threat, Challenge, and Change

Patrick R. Steffen^{1*}, Dawson Hedges² and Rebekka Matheson³¹ Department of Psychology, Brigham Young University, Provo, UT, United States, ² Departments of Psychology and Neuroscience, Brigham Young University, Provo, UT, United States

Theory impacts how research is conducted. A popular theory used to conceptualize brain functioning is the triune brain theory. The triune brain theory is an evolutionary theory of brain development that emphasizes three key brain regions consisting of the brainstem, the limbic system, and the cortex that function relatively independently in coping with stress via fight or flight, emotion, and cognition, respectively. However, modern neuroscience research demonstrates that the triune brain theory does not accurately explain how the brain functions in everyday life or during the stress response. Specifically, emotion and cognition are interdependent and work together, the limbic system is not a purely emotional center nor are there purely emotional circuits in the brain, and the cortex is not a purely cognitive center nor are there purely cognitive circuits in the brain.

OPEN ACCESS

Edited by:
Paul M. Lehrer,
The State University of New Jersey,
United States

We propose a new evolutionarily based model, the adaptive brain, that is founded on adaptive prediction resulting from interdependent brain networks using interoception and exteroception to balance current needs, and the interconnections among homeostasis, allostasis, emotion, cognition, and strong social bonds in accomplishing adaptive goals.

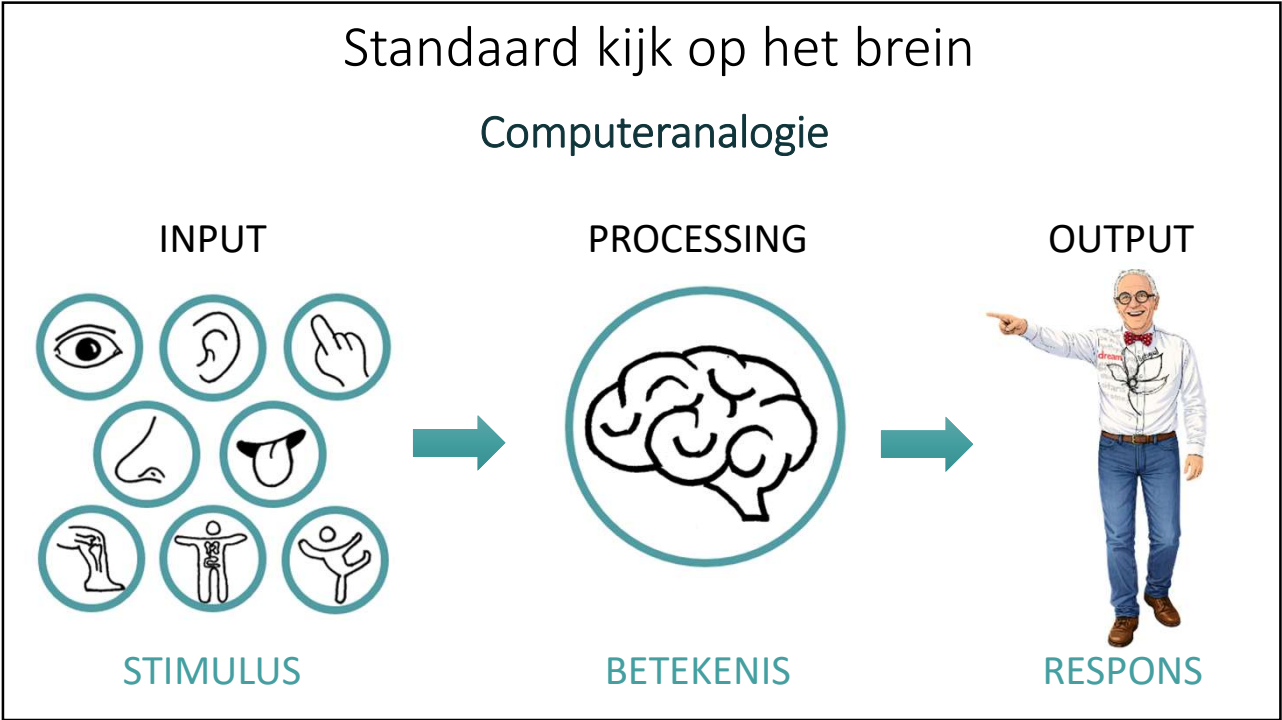
Downstairs en upstairs: zo werkt emotieregulatie dus niet

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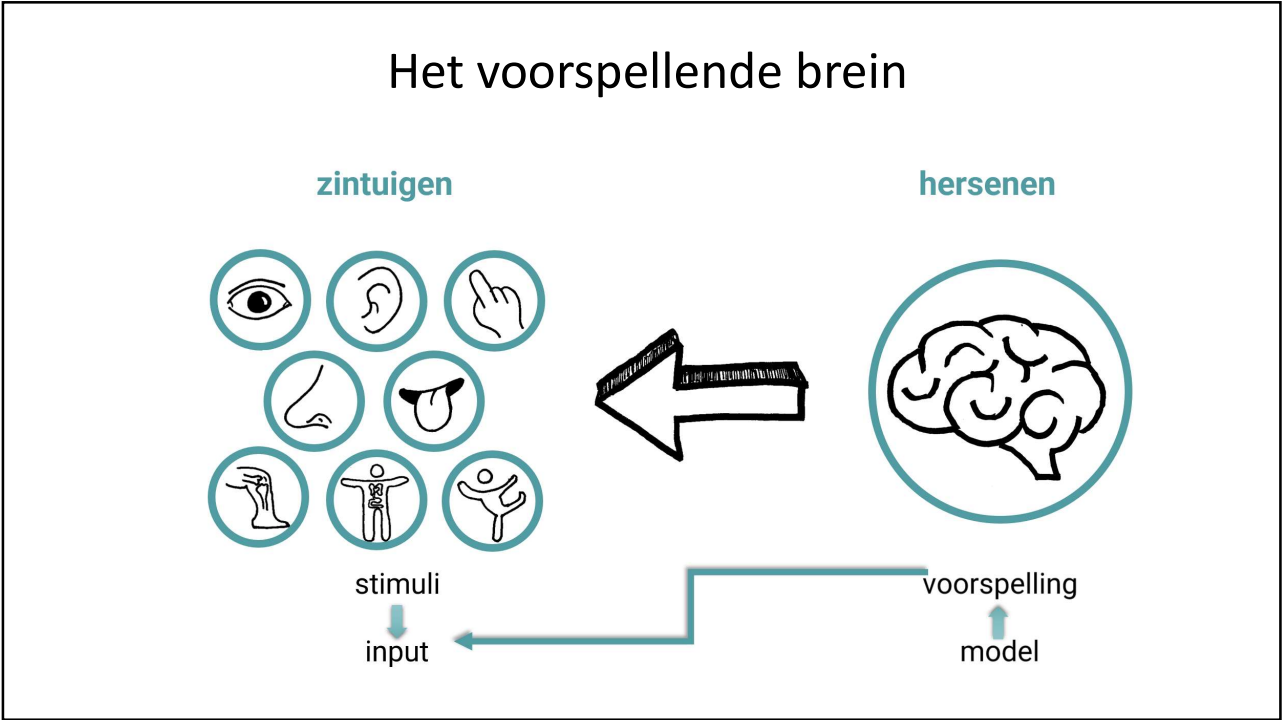
- Emoties zijn een **constructie** van je volledige brein
- Ze zijn een onderdeel van het voorspellende brein en dus geen reactie op iets, maar **anticipatie**
- De **woorden** kennen voor emoties betekent niet dat je ze kent
- Weten hoe je je voelt is **niet** nodig om jezelf te reguleren



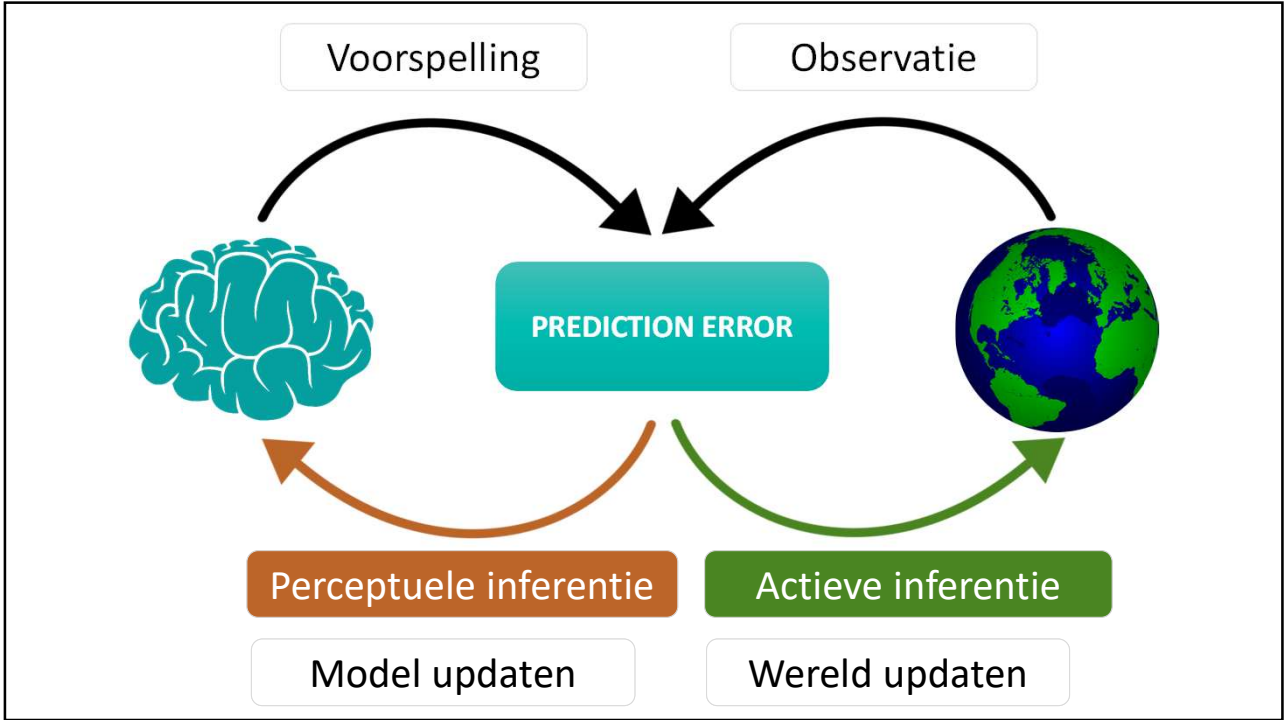
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Over- en onderprikkeling

Sociaal navigeren

Communicatie

The book cover is light blue with the title 'AUTISME & HET VOOR SPELLENDE BREIN' in large, white, sans-serif capital letters. The author's name 'PETER VERMEULEN' is at the top. A circular badge on the right side contains the text 'ABSOLUUT DENKEN IN EEN RELATIEVE WERELD'. The publisher's name 'PELCKMANS' is at the bottom.

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Predictive coding framework

Redefining ADHD in the Light of Predictive Coding and Active Inference: A Neurodevelopmental Perspective

Richard Murdoch Montgomery ^{*}

► Front Hum Neurosci. 2022 Mar 3;16:787495. doi: [10.3389/fnhum.2022.787495](https://doi.org/10.3389/fnhum.2022.787495)

A Predictive Coding Framework for Understanding Major Depression

Jessica R Gilbert ^{1,*}, Christina Wusnich ¹, Carlos A Zarate Jr ¹

► Biol Psychiatry. 2018 Nov 1;84(9):634–643. doi: [10.1016/j.biopsych.2018.05.015](https://doi.org/10.1016/j.biopsych.2018.05.015)

The Predictive Coding Account of Psychosis

Philipp Sterzer ^a, Rick A Adams ^c, Paul Fletcher ^{e,f}, Chris Frith ^d, Stephen M Lawrie ^g, Lars Muckli ^h, Predrag Petrovic ⁱ, Peter Uhlhaas ^h, Martin Voss ^b, Philip R Corlett ^{j,*}

► Front Psychol. 2017 Oct 17;8:1840. doi: [10.3389/fpsyg.2017.01840](https://doi.org/10.3389/fpsyg.2017.01840)

Predictive Processing and the Varieties of Psychological Trauma

Sam Wilkinson ^{1,*}, Guy Dodgson ², Kevin Meares ²

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ISSN 0952-8436 | Volume 371 | Issue 1708 | 19 November 2016

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B

BIOLOGICAL SCIENCES

Interception beyond homeostasis: affect, cognition and mental health

Theme issue compiled and edited by Marcos Tsakiris and Hugo D. Critchley



THE ROYAL SOCIETY PUBLISHING

PHILOSOPHICAL TRANSACTIONS B

rsta.royalsocietypublishing.org

Review  

Cite this article: Seth AK, Friston KJ. 2016 Active interoceptive inference and the emotional brain. *Phil. Trans. R. Soc. B* **371**: 20160007. <http://dx.doi.org/10.1098/rsta.2016.0007>

Accepted: 3 August 2016

One contribution of 16 to a theme issue 'Interception beyond homeostasis: affect, cognition and mental health'.

Active interoceptive inference and the emotional brain

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²Wellcome Trust Centre for Neuroimaging, Institute of Neurology, UCL, London WC1N 3BG, UK

 AKS, 0000-0002-1421-6051

We review a recent shift in conceptions of interoception and its relationship to hierarchical inference in the brain. The notion of interoceptive inference means that bodily states are regulated by autonomic reflexes that are enslaved by descending predictions from deep generative models of our internal and external milieu. This re-conceptualization illuminates several issues in cognitive and clinical neuroscience with implications for experiences of selfhood and emotion. We first contextualize interoception in terms of active (Bayesian) inference in the brain, highlighting its enactivist (embodied) aspects. We then consider the key role of uncertainty or precision and how this might translate into neuromodulation. We next examine the implications for understanding the functional anatomy of the emotional brain, surveying recent observations on agranular cortex. Finally, we turn to theoretical issues, namely, the role of interoception in the construction of embodied selfhood and feeling. We will discuss

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OXFORD

Social Cognitive and Affective Neuroscience, 2017, 1–23

doi: [10.1093/scan/nsw154](https://doi.org/10.1093/scan/nsw154)

Advance Access Publication Date: 19 October 2016

Original article

The theory of constructed emotion: an active inference account of interoception and categorization

Lisa Feldman Barrett^{1,2,3}

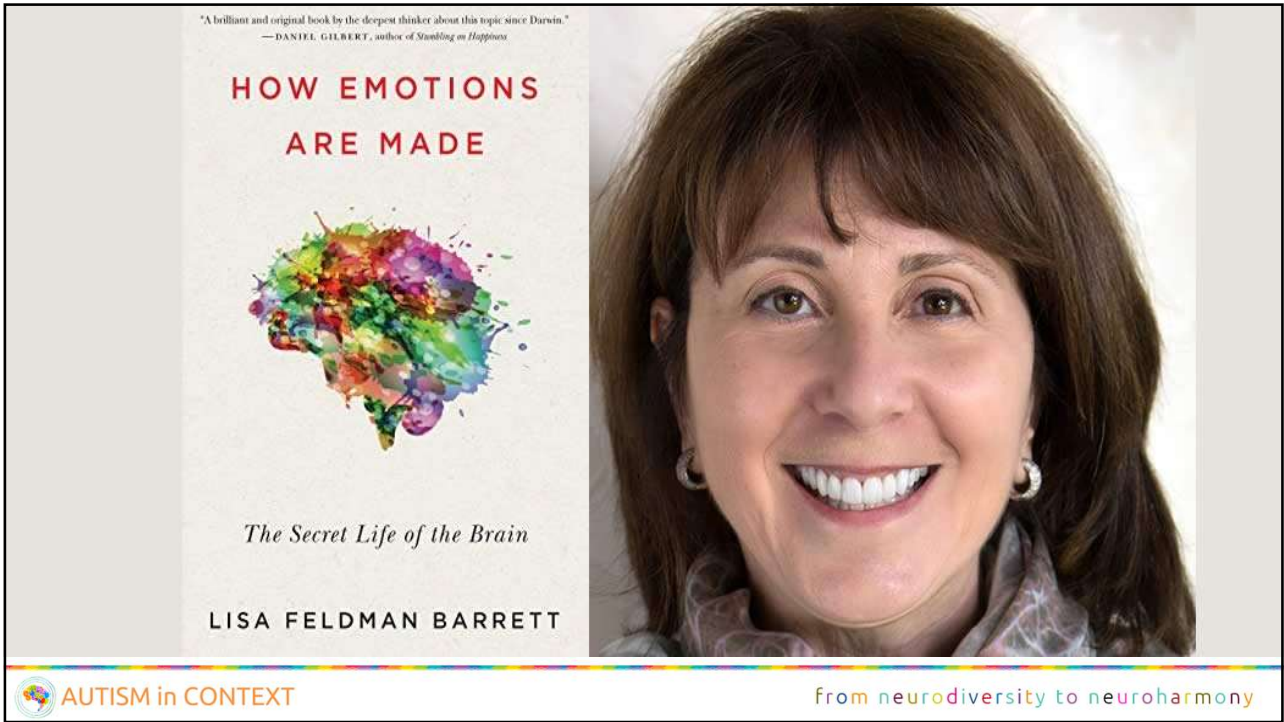
¹Department of Psychology, Northeastern University, Boston, MA, USA, ²Athinoula, A. Martinos Center for Biomedical Imaging and ³Psychiatric Neuroimaging Division, Department of Psychiatry, Massachusetts General Hospital and Harvard Medical School, Charlestown, MA, USA.

Correspondence should be addressed to Lisa Feldman Barrett, Department of Psychology, Northeastern University, Boston, MA, USA. E-mail: l.barrett@neu.edu

 **AUTISM in CONTEXT**

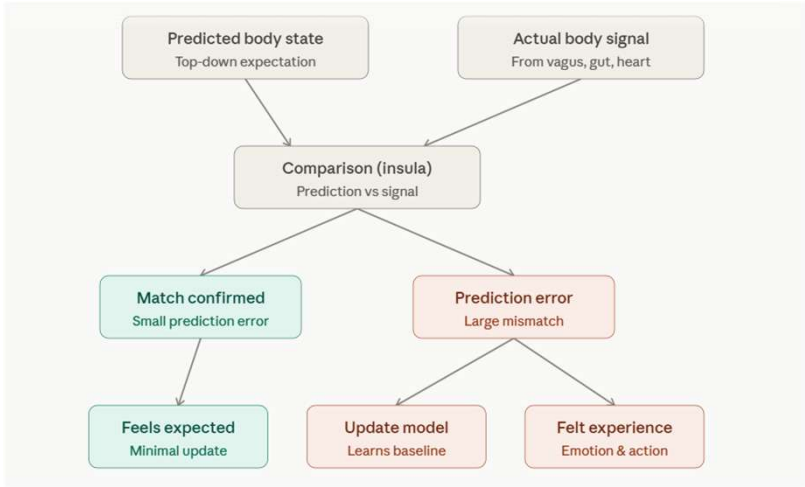
from neurodiversity to neuroharmony

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Emoties als onderdeel van de voorspelfoutminimalisatie



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Wat heb je nodig voor emotieherkenning en regulatie?

- Kennis over de lichamelijke parameters die de hersenen opvragen in het lichaam: interoceptieve vaardigheden
- Contextgevoeligheid
- Emoties begrijpen



AUTISM in CONTEXT

from neurodiversity to neuroharmony

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Interoceptie: verschillende dimensies

Biological Psychology 104 (2015) 65–74



Contents lists available at ScienceDirect

Biological Psychology

journal homepage: www.elsevier.com/locate/biopsycho

Knowing your own heart: Distinguishing interoceptive accuracy from interoceptive awareness



Sarah N. Garfinkel^{a,b,*}, Anil K. Seth^{b,c}, Adam B. Barrett^{b,c},
Keisuke Suzuki^{b,c}, Hugo D. Critchley^{a,b}

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AUTISM in CONTEXT

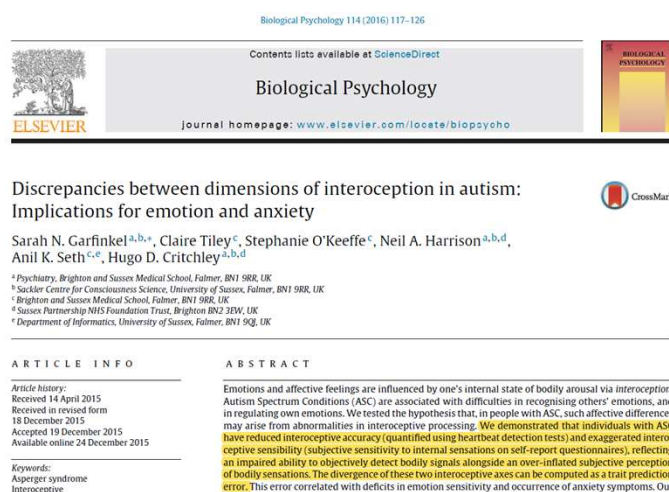
from neurodiversity to neuroharmony

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Interoceptie: verschillende dimensies

- **Gevoeligheid:** hoe gefocust ben je op je lichaamssignalen
- **Accuraatheid:** hoe accuraat ben je in het detecteren en monitoren van lichaamssignalen
- **Bewustzijn:** metacognitief bewustzijn van je eigen accuraatheid

Gevoeliger voor lichaamssignalen maar minder accuraat in het lezen ervan



Gevolgen van lage accuraatheid

- Moeilijkheden met '**body budgeting**' (Lisa Feldman Barrett)
 - Drinken
 - Eten
 - Blaas en darmbewegingen
 - Energieniveau
 - Vermoeidheid en slaapbehoefte
 - Emotieregulatie

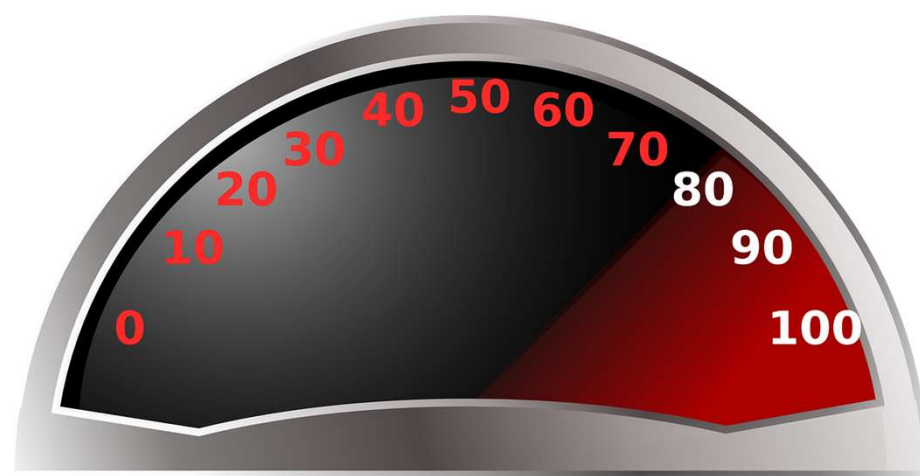


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from neurodiversity to neuroharmony

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Hoe kan je reguleren als je niet kan monitoren?



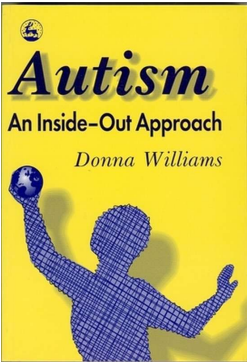
AUTISM in CONTEXT

from neurodiversity to neuroharmony

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“Over-, under- en misfirings”

Williams, D. (1996). Autism: an inside-out approach. London: Jessica Kingsley Publishers



Donna Williams



23

Semantische kennis vs. kunnen differentiëren

Research in Autism Spectrum Disorders 7 (2013) 1221–1227

Contents lists available at [ScienceDirect](#)

 **ELSEVIER**

Research in Autism Spectrum Disorders

Journal homepage: <http://ees.elsevier.com/RASD/default.asp>



Emotion differentiation in autism spectrum disorder

Yasemin Erbas^{a,*}, Eva Ceulemans^a, Johanna Boonen^a, Ilse Noens^{b,c}, Peter Kuppens^{a,d}

^a Faculty of Psychology and Educational Sciences, KU Leuven, Tienestraat 102, 3000, Leuven, Belgium
^b Parenting and Special Education Research Unit, KU Leuven, Leopold Vanderkelenstraat 32, 3000, Leuven, Belgium
^c Leuven Autism Research, KU Leuven, Leuven, Belgium
^d Melbourne School of Psychological Sciences, University of Melbourne, Parkville Victoria, 3010, Australia

 CrossMark

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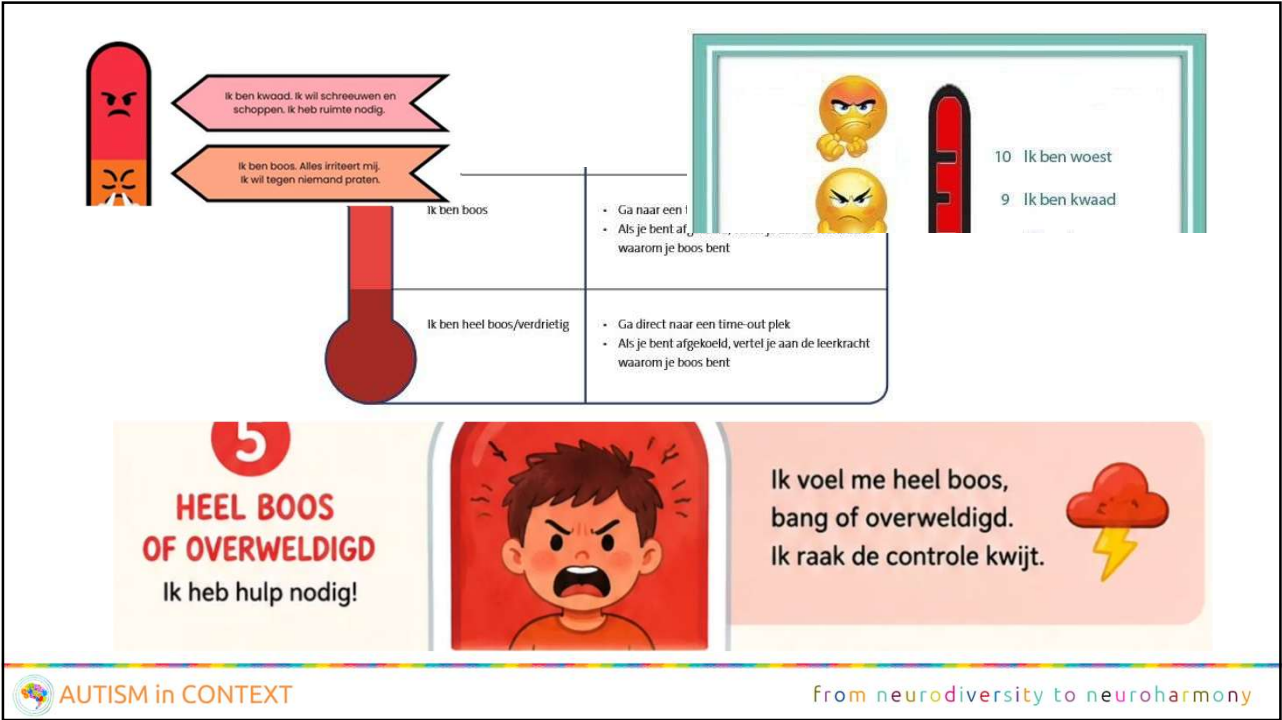
Emoties herkennen bij jezelf

- De namen kennen van emoties volstaat niet
- Je moet de 'labels' kunnen linken aan
 - lichaamssignalen
 - gebeurtenissen
 - vorige ervaringen (→ voorspellingen)

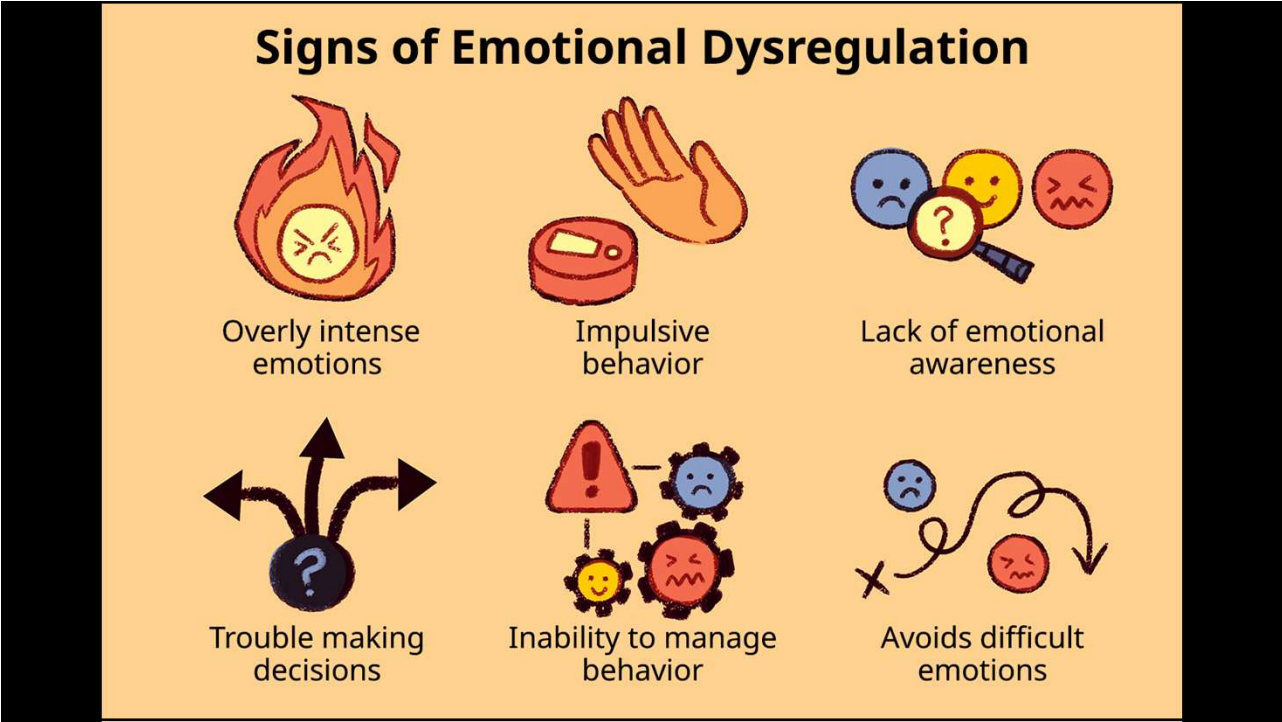
Met andere woorden, aan: **context**

Emotiethermometers: om over na te denken

- Hoe eenduidig zijn de verschillende secties?
- Verschillende emoties of gradaties binnen één emotie?
- Klopt de opbouw wel?
- Hoe gedifferentieerd moet het?
- Moet die rode zone wel als je je dan toch niet meer kunt reguleren? Kan je dan nog wel een thermometer gebruiken?



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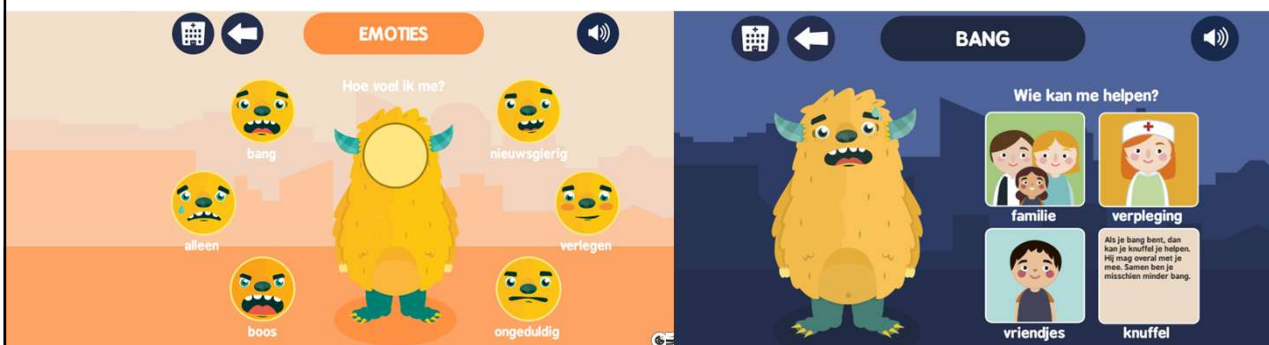
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Emotiethermometers: om over na te denken

- Triggeren we niet net wat we willen vermijden?
 - Wat staat bovenaan?
 - Wat suggereren de kleuren?
 - Is er ook ruimte voor aangename gevoelens?
 - Wanneer zetten we de thermometer in? (enkel wanneer iemand storend gedrag vertoont?)



Moet het wel een thermometer zijn?



Emotiethermometers: om over na te denken

- Is er ook ruimte om:
 - Niet te weten hoe je je voelt?

JA, NEEN en TWIJFEL gevoel

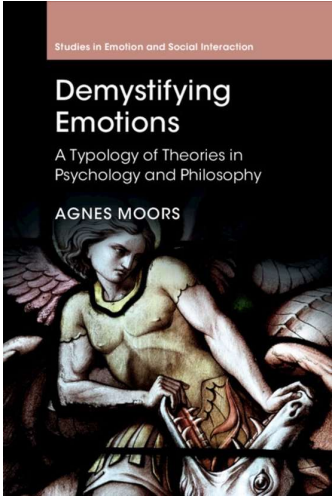


JA gevoel 	NEEN gevoel 	TWIJFEL gevoel 
Wanneer iets gebeurt dat je leuk vindt	Wanneer iets gebeurt dat je niet leuk vindt	Wanneer iets gebeurt en je weet niet of je het leuk vindt of niet
Wanneer iets gebeurt dat je een goed gevoel geeft	Wanneer iets gebeurt dat je een slecht gevoel geeft	Wanneer iets gebeurt en je weet niet of het goed of slecht is
Mijn voorbeeld:	Mijn voorbeeld:	Mijn voorbeeld:

Emotiethermometers: om over na te denken

- Wat wil je bereiken met de thermometer?
 - Weten hoe een kind of jongere zich voelt
 - Bevorderen van zelfcontrole
 - Minder storend gedrag
 - Emotieregulatie, en zo ja: wie moet wie reguleren?
 - Zelfkennis bevorderen bij het kind

Emoties als voorspelfoutminimalisatie



Restricted access | Research article | First published online March 5, 2026

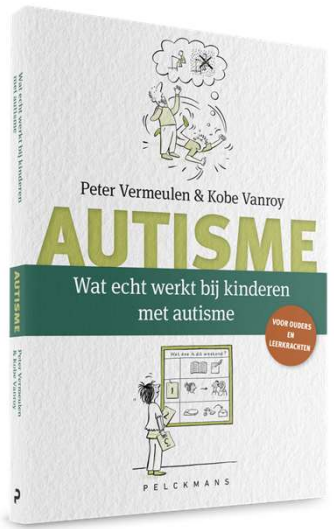
Emotions as High-Impact Decisions: A Goal-Directed Theory

[Agnes Moors](#) [View all authors and affiliations](#)

Emotieregulatie

Vraag naar
behoeften,
niet naar
emoties

TIEN BEHOEFTEN		
VOORAF 7 WAT IS AUTISME (NIET)? 11	1 BEGREPEN WORDEN 37	2 DUIDELIJKHEID 51
3 VOORSPELBAARHEID 69	4 REGIE KRIJGEN 85	5 VERBODENHEID 99
6 GOEDE AFSPRAKEN EN REGELS 111	7 EEN POSITIEF ZELFBEELD 125	8 EEN GOED GEVOEL 139
9 BETEKENIS 151	10 AANMOEDIGING 163	MEER LEZEN 176 STERKMAKERS IN AUTISME 178



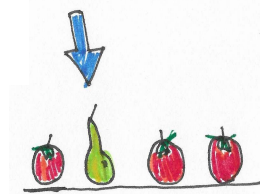
Oplossingsgerichte emotieregulatie



wondervraag



de uitzondering



schaalvraag



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Co-regulatie

- Stay calm and breathe normally
- Neem het niet persoonlijk
- We gaan dit samen doen
- Oplossings- en behoeftegericht
- Verhelder (minimaliseert voorspellingsfouten)

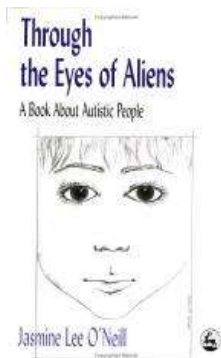


ijskastmoeder, uit liefde

VVA campagne,

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Co-regulatie is vaak: verhelderen



- “When I cry, I do not always need the ordinary comfort, What I need is information and an explanation about the situation that helps me back to get grip on it...”
- Jasmine Lee O’Neill (1998)



AUTISM in CONTEXT

from neurodiversity to neuroharmony

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Warm aanbevolen voor emotieregulatie

Journal of Autism and Developmental Disorders
<https://doi.org/10.1007/s10803-020-04418-2>

BRIEF REPORT



Brief Report: Impact of a Physical Exercise Intervention on Emotion Regulation and Behavioral Functioning in Children with Autism Spectrum Disorder

Andy C. Y. Tse¹

© Springer Science+Business Media, LLC, part of Springer Nature 2020

Abstract

Problems with emotion regulation and behavior are often reported in children with autism spectrum disorders (ASD). This pilot study examined the effect of physical exercise on emotion regulation and behavioral functioning in children with ASD. Twenty-seven children aged 8–12 years were randomized into either an exercise intervention group (n = 15) or a control group (n = 12). The intervention group received a 12-week jogging intervention. Children’s parents completed the Emotion Regulation Checklist and the Child Behavior Checklist pre- and post-intervention. **The intervention group demonstrated significant improvement in emotion regulation and reduction in behavioral problems ($p < .05$).** Future studies should explore the mechanisms underlying the effects of physical exercise on emotion regulation and behavior in children with ASD.



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Warm aanbevolen voor emotieregulatie

Autism in Adulthood, Vol. 1, No. 3 | Perspective

Physical Activity for Autistic Adults: Recommendations for a Shift in Approach

Rachel Hallett

Published Online: 11 Sep 2019 | <https://doi.org/10.1089/aut.2019.0016>

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Abstract

What does existing research show?

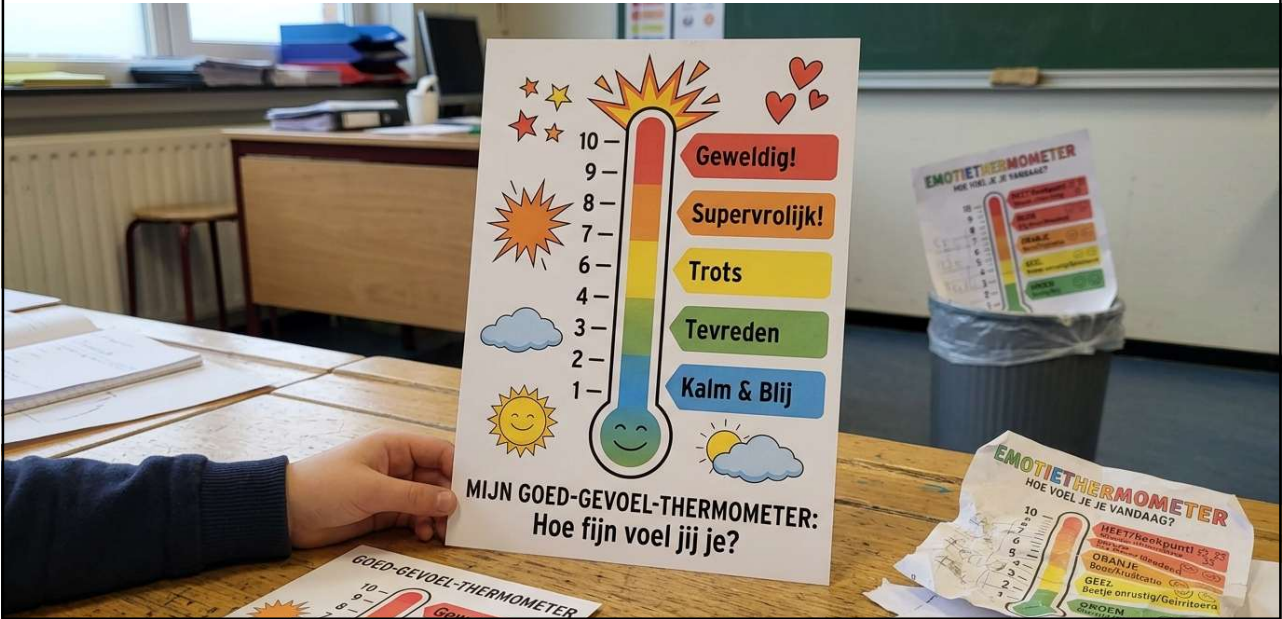
Research so far has consisted of small studies, and the designs have often been poor. There is a tendency to overlook the well-being of autistic people and to focus on stopping certain behaviors without recognizing why they are happening, or that they may be helpful for autistic people. **Studies found that physical activity has many benefits for autistic people, such as increasing well-being, helping with emotional regulation, improving walking gait and balance, and raising activity levels.** However, most studies did not look at health and fitness outcomes and were more focused on outcomes that have not been identified as important to autistic people.



from neurodiversity to neuroharmony

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En wat als we nu eens zouden focussen op goed gevoel?



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10 geluksstrategieën



Jezelf aanvaarden en graag zien

1. **Goed Gevoel Doos**
2. Flow activiteiten
3. Bewegen en sport
4. Routines
5. Probleemgerichte copingstrategieën
6. Emotiegerichte copingstrategieën
7. Positief denken
8. Dankbaarheid
9. Vriendelijkheid
10. Persoonlijke projecten: iets nieuws leren

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