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COMPUTATIONAL PSYCHIATRY COURSE ZURICH

## Psychosomatic Medicine: an introduction

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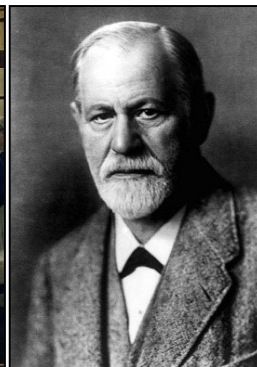
# Overview

- ▶ What is Psychosomatic Medicine?
  - ▶ Two traditions
  - ▶ The field of Psychosomatic Medicine in Germany
  - ▶ Main clinical topics and treatments
- ▶ Bodily distress: clinical problems and models
  - ▶ The spectrum of bodily distress
  - ▶ The “difficult patient”
  - ▶ Bodily distress, predictive processing and disorders of the embodied self

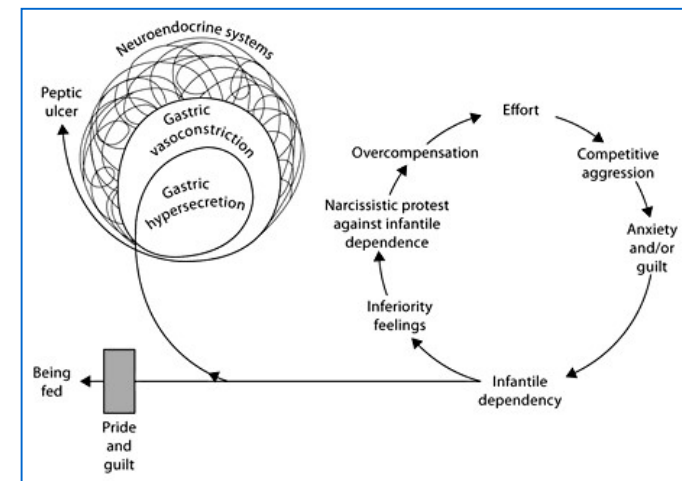
## Two traditions of modern psychosomatic medicine

### ► Psychogenetic tradition

- Body as theater of the soul ("conversion" of psychic conflicts into bodily symptoms like seizures or paresis)
- clear psychotherapeutic strategies – but dualistic, less acceptable to patients
- Psychosomatic Medicine = Medical value of psychoanalysis

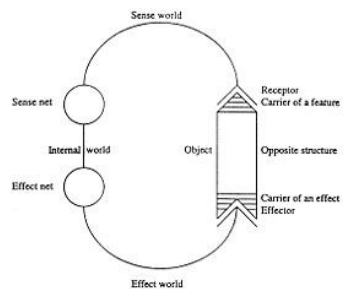


Sigmund Freud  
1856 - 1939

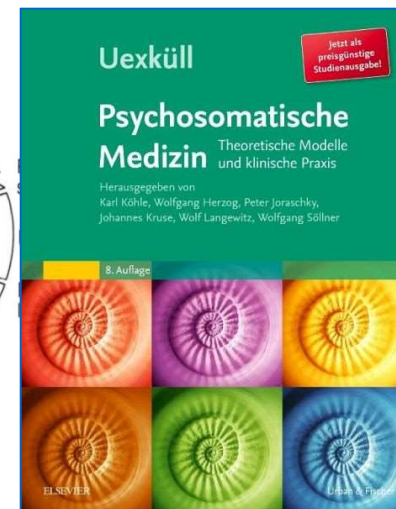
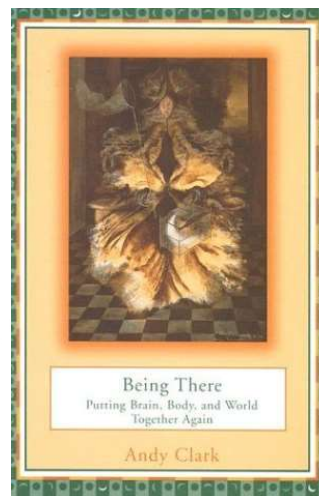
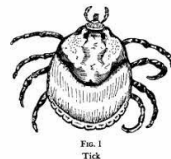


# Two traditions of modern psychosomatic medicine

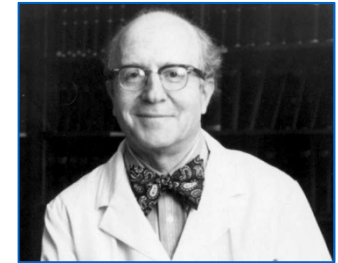
- ▶ **Integrative tradition** (Internal medicine/ neurology)
  - ▶ Organism in meaning-centered interaction with environment
  - ▶ Precursors of embodied, embedded, enactive approaches
  - ▶ Good model for doctor-patient-interaction, but no clear therapeutic strategy
  - ▶ “Introduction of the subject into medicine” (Viktor von Weizsäcker 1886-1957)



Schema des Funktionskreises



# Biopsychosocial model of disease



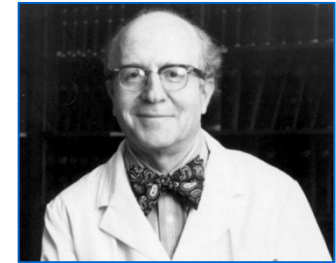
George L. Engel

- ▶ George L. Engel, Science 1977

Old model

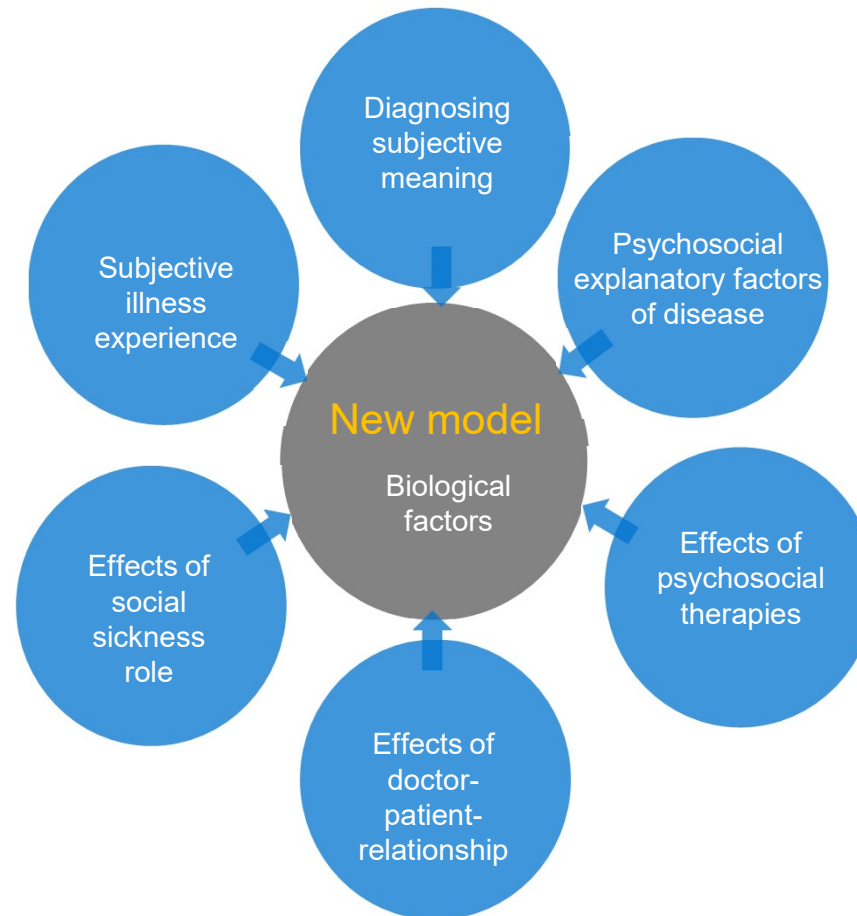
Biological  
factors

# Biopsychosocial model of disease



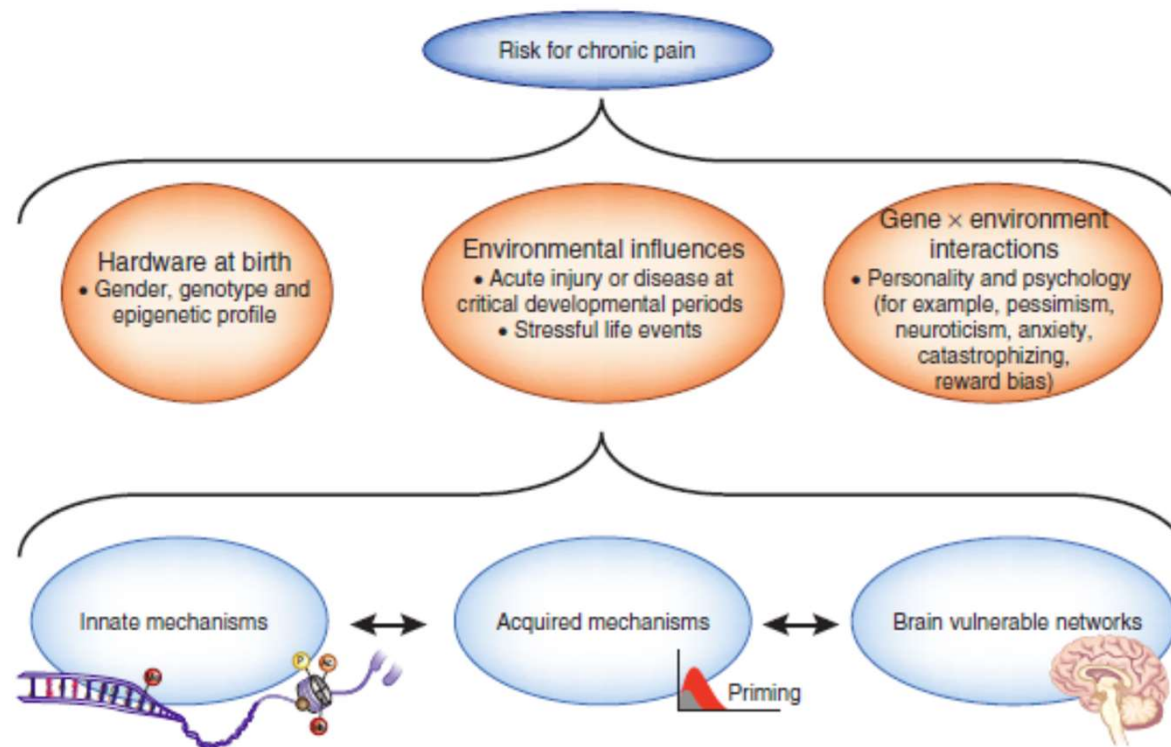
George L. Engel

- Central elements (George L. Engel, Science 1977)



## Biopsychosocial model of disease

- ▶ Example: risk factors for chronic pain – a view from neuroscience



# The field of Psychosomatic Medicine in Germany

- ▶ Psychosomatic Medicine as a separate medical speciality
  - a German “Sonderweg” of **psychotherapy in medicine**
    - ▶ Emigration/ prosecution of psychoanalysts and longstanding resistance of German psychiatry against psychotherapy
    - ▶ First university dept in Heidelberg in 1950 (Rockefeller foundation)
    - ▶ Separate subject in medical studies since 1972
    - ▶ Separate board certification “Psychosomatic Medicine and Psychotherapy” since 1992 (5 yrs (1 yr somatic med), 1500 supervised psychotherapy sessions)
      - internal debate about pros and cons
    - ▶ More than 12000 hospital beds in more than 250 departments/ hospitals
    - ▶ **But:** Institutionalization of Psychosomatic Medicine is endangered even in Germany (the small fish...)





# Clinical spectrum of Psychosomatic Medicine

## ► Disorders

- » Bodily distress/ functional somatic symptoms
- » Somatopsychic disorders (Psychooncology, Psychocardiology etc.)
- » Eating disorders
- » Posttraumatic disorders
- » Personality disorders
- » Depression/ Anxiety disorders

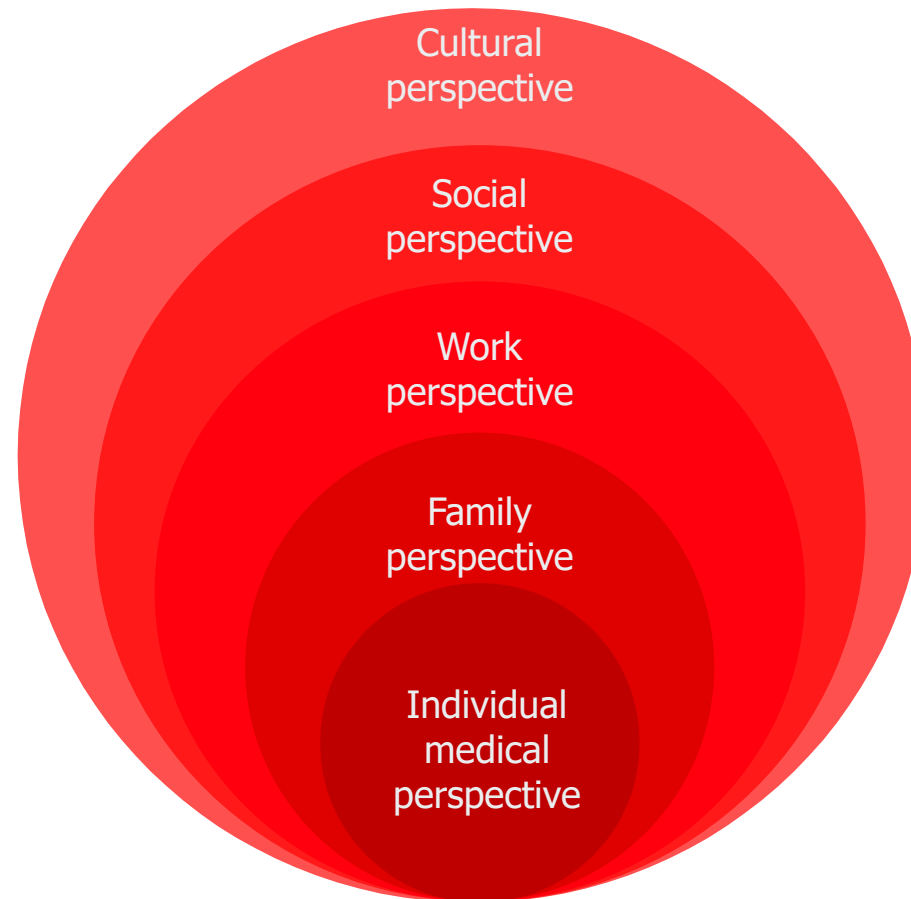


Overlap with psychiatry

A solid red circle located at the bottom center of the slide.

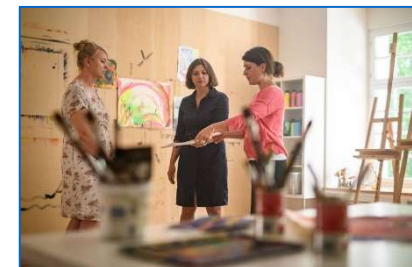
Individual  
medical  
perspective

## Clinical spectrum of Psychosomatic Medicine



# Clinical spectrum of Psychosomatic Medicine

- ▶ Treatment principles (in more severe cases)
  - ▶▶ Goals: better quality of life, more self efficacy, less symptoms (not: “cure”)
  - ▶▶ Means: Multimodal and interpersonal (therapist as participant)
  - ▶▶ Psychotherapy in different modalities as top priority (single, group, family, body oriented, art therapy etc.)
  - ▶▶ Psychopharmacology only supplementary
  - ▶▶ Somatic diagnostics and therapy as needed
  - ▶▶ Physiotherapy
  - ▶▶ Social therapy



## The spectrum of bodily distress

- ▶ Three types of symptoms of “bodily distress”
  - ▶ Pain in different locations (head, back, extremities etc.)
  - ▶ Functional disturbances (cardiovascular, gastroenterological, neurological etc.)
  - ▶ Fatigue
  - ▶ Often multiple, not (fully) explained by well defined organic disease
- ▶ Main characteristics
  - ▶ very frequent (25% of all primary care patients)
  - ▶ often severe impairment of functioning – frequent cause of disability



## Functional impairment in bodily distress disorders

**Table 1** Disability, distress and employment status of cases with symptoms 'unexplained by organic disease' and controls with symptoms 'explained by organic disease'

	Cases	Controls	OR difference in means (95% CI)
Age, mean (SD)	43.6 (14.4)	47.5 (17.0)	−3.85 (−4.98 to −2.72)
Female, % (n/N)	65.3 (747/1144)	53.6 (1414/2637)	1.63 (1.41 to 1.88)
Medical Outcomes Study Short Form 12-Item Scale, mean (SD)*			
General health	42.6 (26.0)	48.7 (24.7)	−6.15 (−7.90 to −4.41)
Hospital Anxiety and Depression Scale, mean (SD)*			
Anxiety subscale	7.9 (5.0)	6.4 (4.5)	1.51 (1.19 to 1.84)
Depression subscale	5.9 (4.9)	4.7 (4.2)	1.21 (0.91 to 1.52)
Not in paid employment, % (n/N)	49.5 (563/1137)	49.9 (1313/2629)	0.98 (0.86 to 1.13)
If not, was this because of health, % (n/N)†	54.2 (297/548)	37.4 (470/1258)	1.98 (1.62 to 2.43)
On income support/unemployment benefit, % (n/N)	19.7 (224/1135)	16.0 (417/2612)	1.29 (1.08 to 1.55)
In receipt of incapacity benefit or disability living allowance, % (n/N)	27.0 (307/1137)	21.9 (573/2614)	1.32 (1.12 to 1.55)

\*Sample size varies between 1134 and 1143 in the not at all/somewhat explained group, and between 2612 and 2633 in the largely/completely explained group.

Scottish Neurological Symptoms Study  
Carson et al., J Neurol Neurosurg Psych 2011

## Bodily distress as an “orphan disease”

- ▶ Confusing parallel classification as a mental and/ or as a somatic disorder
  - ▶▶ Mental: Somatoform/ somatic symptom disorder, e.g. pain disorder
  - ▶▶ Somatic: Functional somatic syndrome, e.g. fibromyalgia, irritable bowel
- ▶ Expertise in dealing with the problem not widely spread
  - ▶▶ Psychosomatic medicine not widely spread
  - ▶▶ Medical students mostly trained in dealing with “classic disease”
- ▶ Neither somatic medicine nor psychiatry really take care
  - ▶▶ Trying to explain phenomenon away  
(e.g. as “masked depression” or as “real” organic disease)
  - ▶▶ Neglect in research and clinical care
- ▶ The field is not interesting for (pharmaceutical) industry

## The “difficult” patient with bodily distress

- ▶ Patient
  - ▶ disappointed (no explanation, no treatment)
  - ▶ feels not taken seriously, fighting for organic explanation (legitimacy)
  - ▶ helpless, doctor shopping



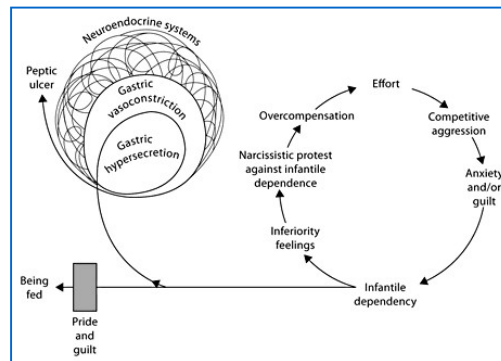
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- ▶ Patient
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  - ▶▶ helpless, doctor shopping
- ▶ Doctors
  - ▶▶ late recognition, not taking seriously, helpless, iatrogenic chronification
- ▶ Psychotherapists
  - ▶▶ unloved patients, “alexithymic”, not introspective, helpless
- ▶ **But:** no nihilism - there are good evidence based guidelines !
  - ▶▶ Psychotherapy is effective (less than in depression and anxiety, however)
  - ▶▶ Activating therapies are effective (graded exercise etc.)
  - ▶▶ Antidepressants and other psychopharmaceutical drugs very limited role  
(AWMF S3-Guideline “Functional somatic symptoms”, Roenneberg et al. 2019)



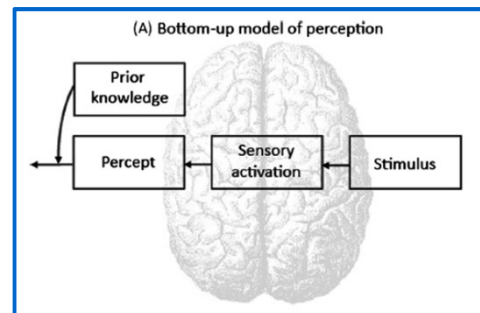
# How to explain the experience of severe bodily distress?

- ▶ Etiology – an area where we know quite a bit
  - ▶ Vulnerability: adverse childhood experiences, prior somatic diseases etc.
  - ▶ Triggering: stressful life events, accidents, acute illness etc.
  - ▶ Maintenance: deconditioning, avoidance and anxiety, secondary gain etc.
- ▶ Mechanisms – an area of debate and uncertainty (until recently)
  - ▶ Top down: “psychogenic” induction ?



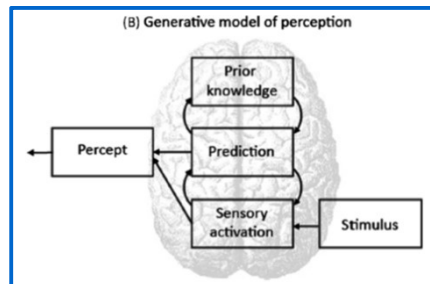
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  - ▶ More promising: “predictive processing” as an ecumenical approach



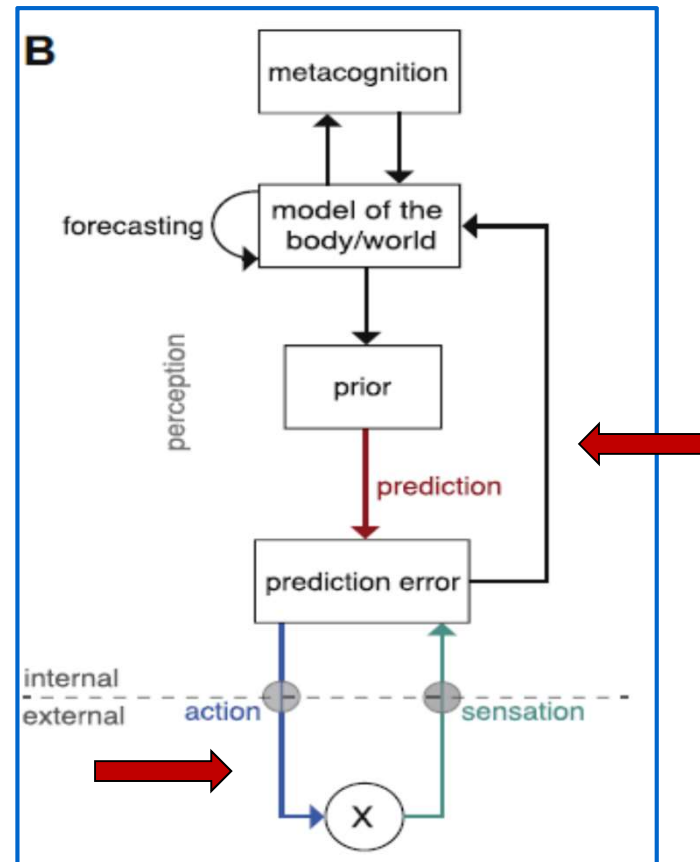
Otten et al.,  
Brain Cognition 2016

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## Key elements of the predictive processing account

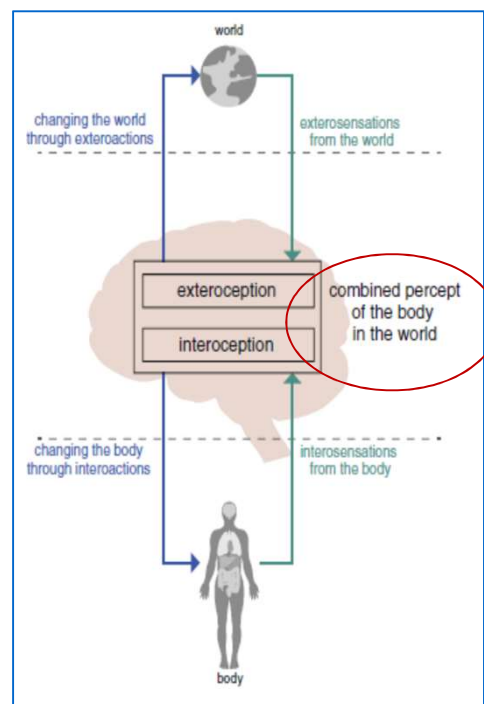


→ Two ways to  
„minimise free energy“

Petzschner et al.  
Biol Psychiatry 2017

## Key elements of the predictive processing account

- ▶ Two directions of predictions and inferences belong together



Petzschner et al.  
Biol Psychiatry 2017

## Key elements of the predictive processing account

- ▶ Interoception as interoceptive inference
  - ▶▶ in two directions: adapt generative model or activate autonomic control
- ▶ In more metaphorical terms interoceptive inference means

“not only has your past viscerosensory experience reached forward to create your present experience, but how your body feels now will again project forward to influence what you will feel in the future.

It is an elegantly orchestrated self-fulfilling prophecy, embodied within the architecture of the nervous system”

## Bodily distress from predictive processing perspective

- ▶ Bodily symptoms as failures of inference

“Our explanation involves primary and secondary failures of inference;

the **primary failure** is the (autonomous) emergence of a percept or belief that is held with undue certainty (precision). This belief can constitute a sensory percept (or its absence) or induce movement (or its absence).

The **secondary failure** of inference is when the ensuing percept is falsely inferred to be a symptom to explain why its content was not predicted by the source of attentional modulation.”

Edwards et al. 2012, p 3495

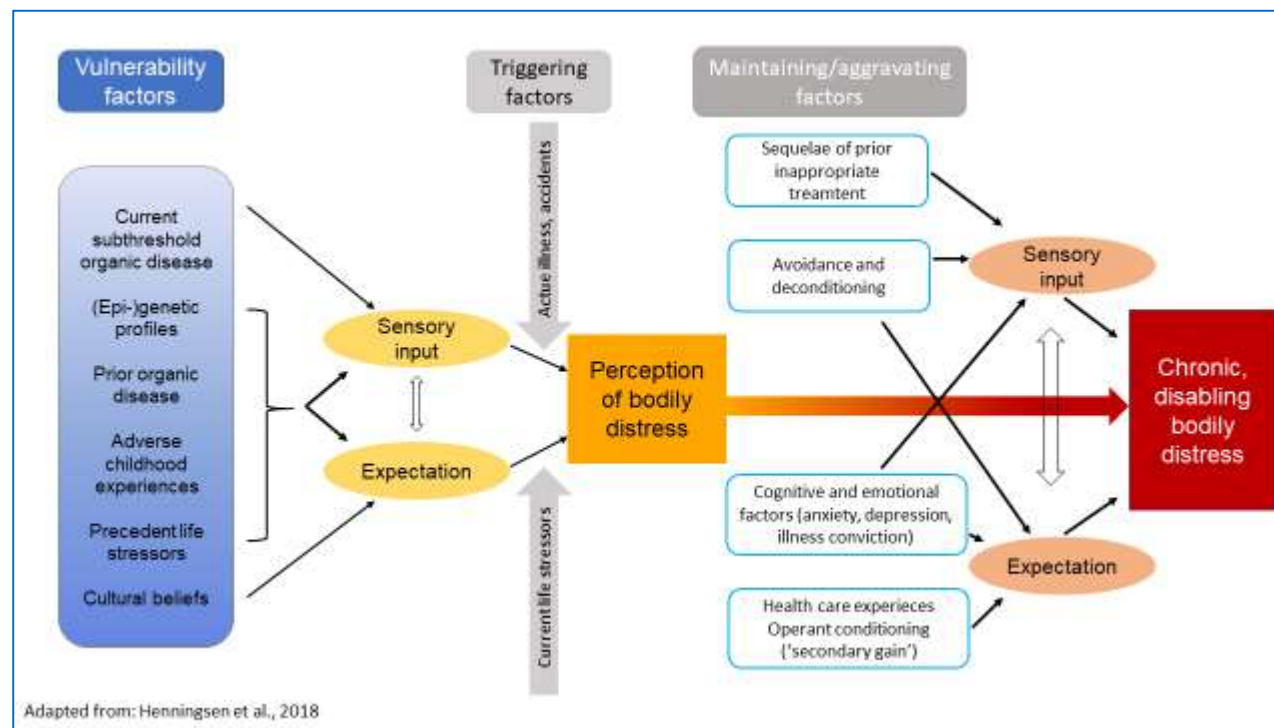


## Bodily distress from predictive processing perspective

- ▶ Some conceptual implications of the PP account of bodily distress
  - ▶ “low precision somatic input combined with precise predictive priors about the bodily state” as general precondition for symptoms
  - ▶ “Stress axis activations” not (only) as cause but as a consequence of interoceptive inference
  - ▶ Distinction of medically explained and unexplained symptoms blurred - Importance of expectation/ inference mechanisms in all types of symptoms
  - ▶ Importance of beliefs, expectations, representations, working models etc. not “only” at the psychological, but down to the basic neurophysiological level

# Bodily distress from predictive processing perspective

- A model for the aetiology of chronic disabling bodily distress



## Bodily distress from the perspective of the predictive processing model of the brain

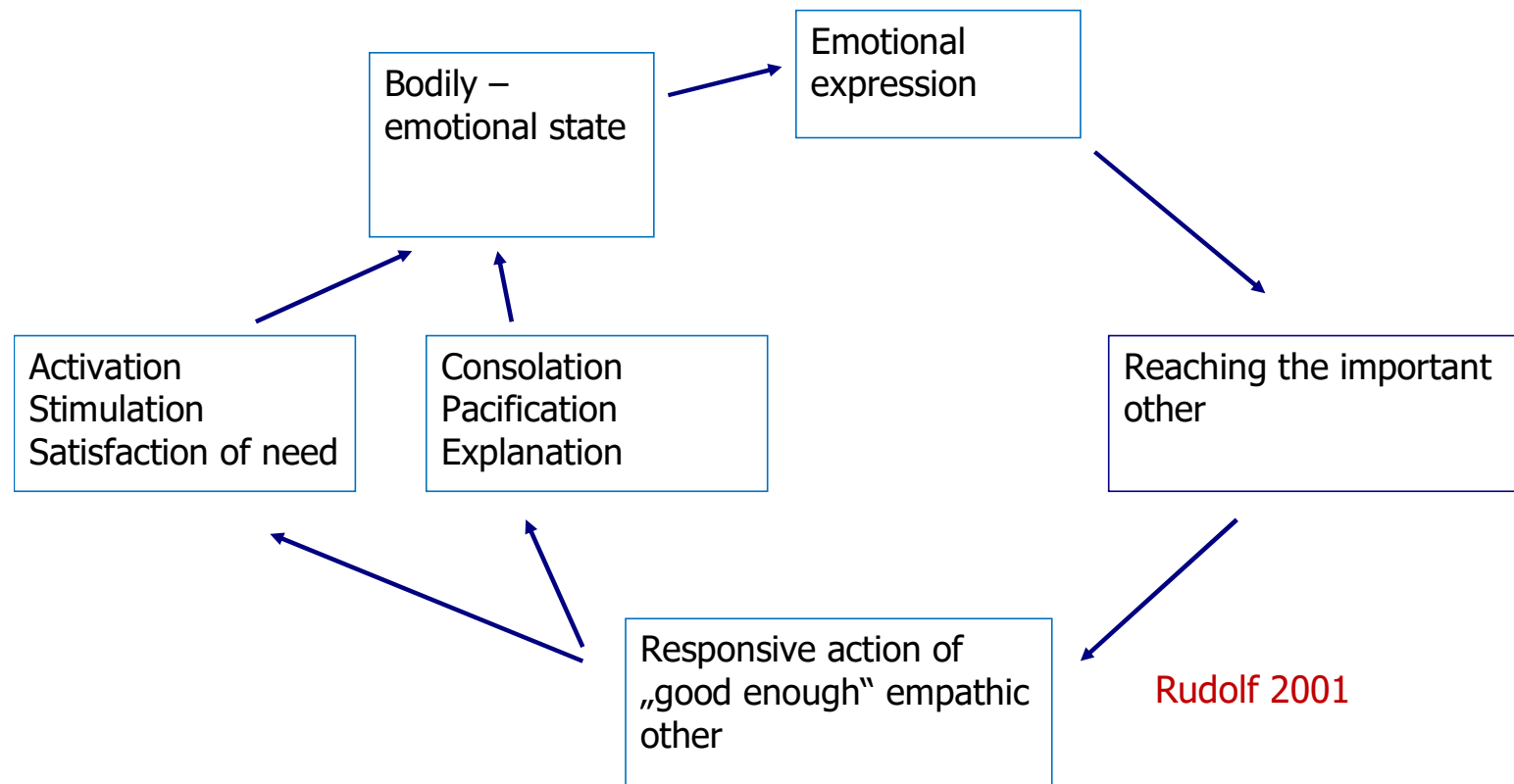
- ▶ Some further conceptual implications of the PP account of bodily distress

- ▶▶ Influence of context – modulation of salience of nociceptive signals in social context
- ▶▶ “Embodied mentalization” during development

“active and perceptual interoceptive inference in development is by necessity mediated by the actions of caregivers that bring about physiological changes, and hence shape the perception of bodily satisfaction, relief, pleasure, pain, or lack thereof”

Fotopoulou and Tsakiris 2017, p 11

## Body and emotion in early relationships



## Bodily distress from the perspective of the predictive processing model of the brain

- ▶ Some further conceptual implications of the PP account of bodily distress

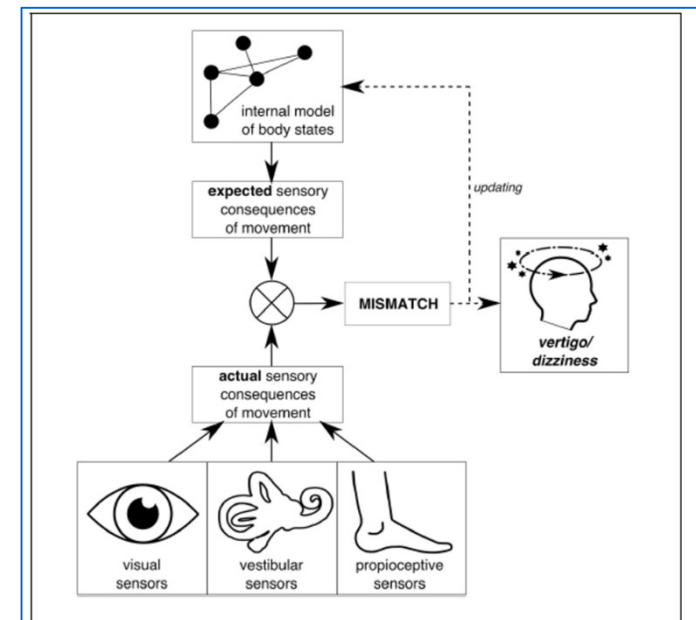
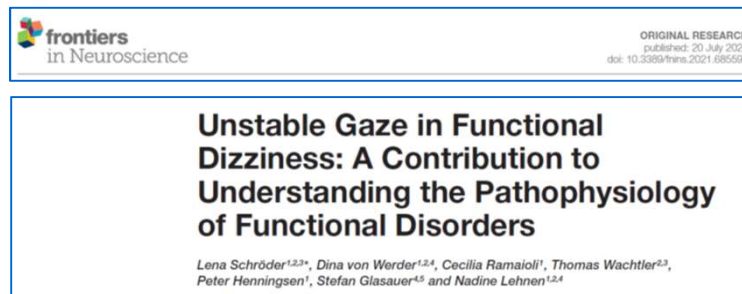
- ▶▶ “Embodied mentalization” later in adulthood

“In other words, our perception of pain, and of bodily threat more generally, may vary not only according to how much tissue damage is communicated by nociceptive, peripheral pathways, but also according to how much social support we predict is available to us in a given situation, or more generally. If we are inclined by prior experiences to trust others and their potential active help during bodily threat, we may experience and react to pain related prediction errors differently than when we are not trusting the availability or effectiveness of others’ support.”

Fotopoulou and Tsakiris 2017, p 15

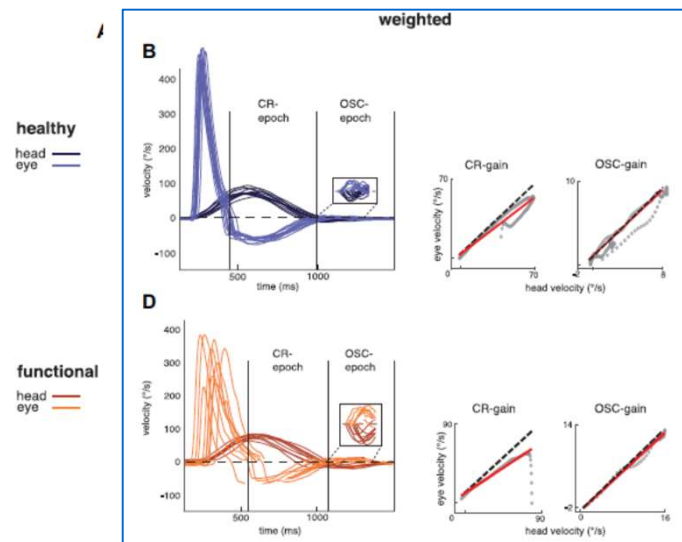
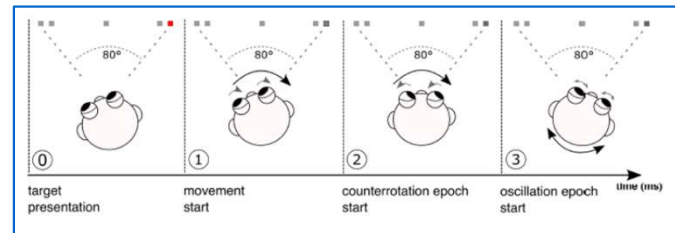
# Bodily distress from predictive processing perspective

## ► Experimental approaches – functional dizziness as an example



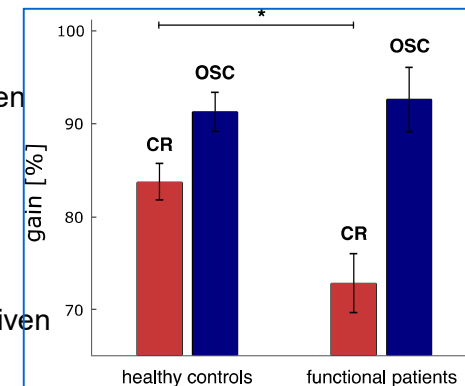
# Bodily distress from predictive processing perspective

## ► Experimental approaches – functional dizziness as an example



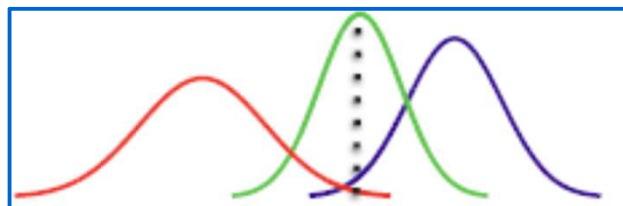
**OSC epoch:**  
sensory-driven

**CR epoch:**  
model based  
expectations  
+ sensory-driven



## Bodily distress from the perspective of the predictive processing model of the brain

- ▶ Some very general **treatment implications** of the PP account of bodily distress
  - ▶ **Aim:** modifying priors
    - direct influence on interoceptive inference
    - less precision for disease priors
    - more precision for prediction errors, i.e. differentiation of sensory and emotional experience
    - can be achieved via different therapeutic modalities and foci (e.g. focus on expectations, bodily or relationship experiences)



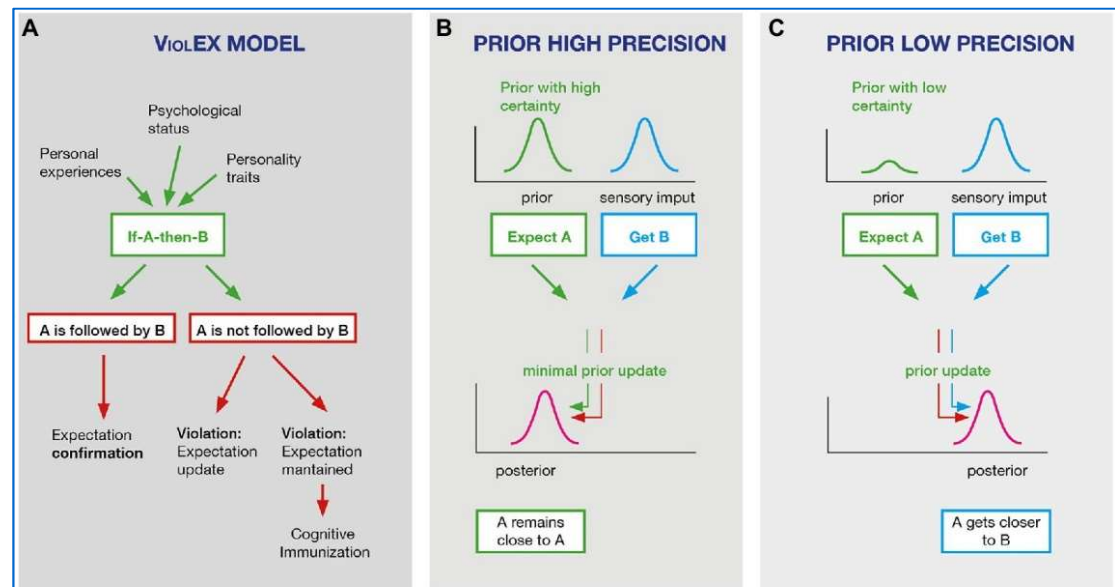


# Bodily distress from predictive processing perspective

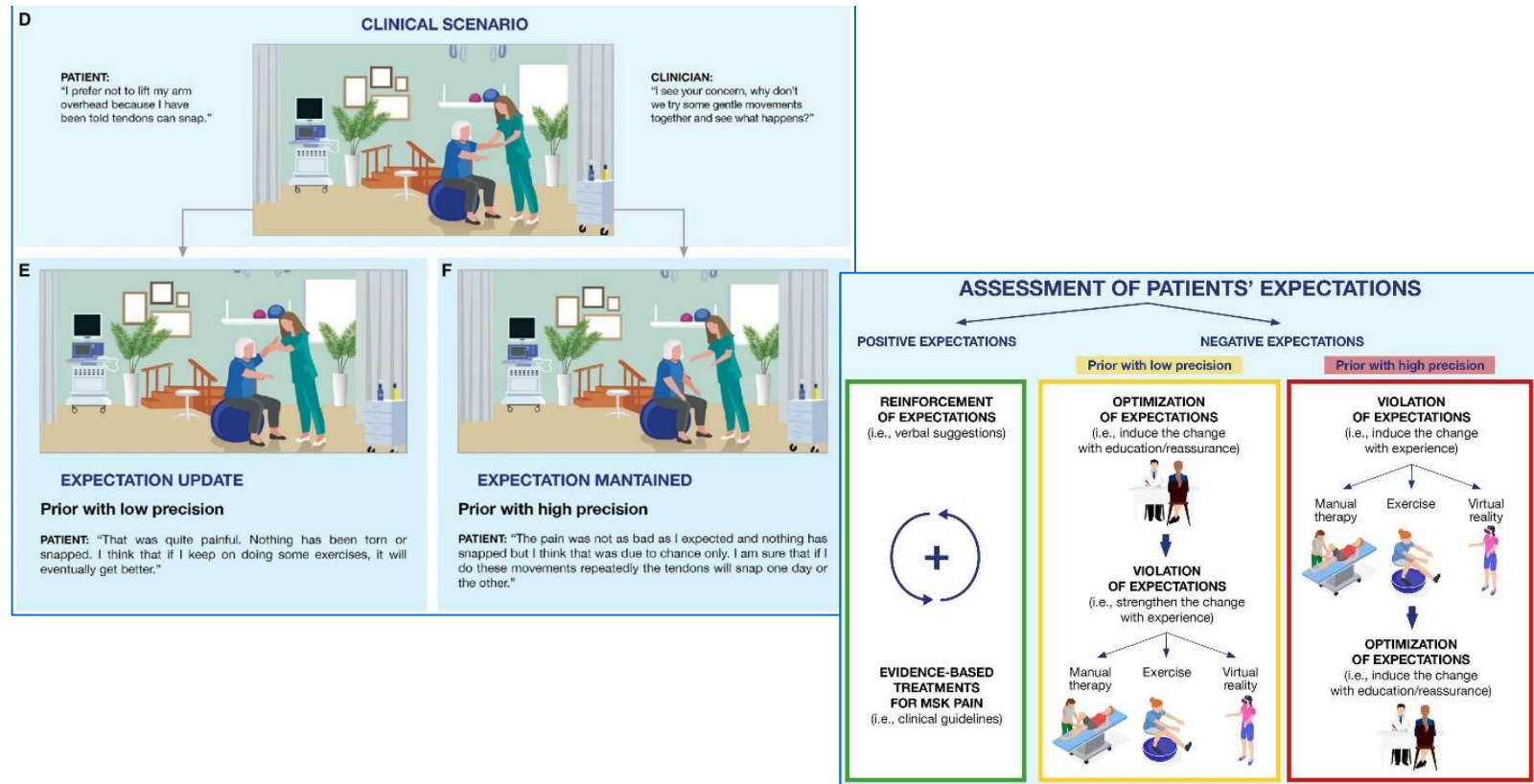
- ▶ Some very general **treatment implications** of the PP account of bodily distress
- ▶ **Example:** Influence of precision of expectation on treatment strategy



Rossetti G et al.  
Front Psychol 2022

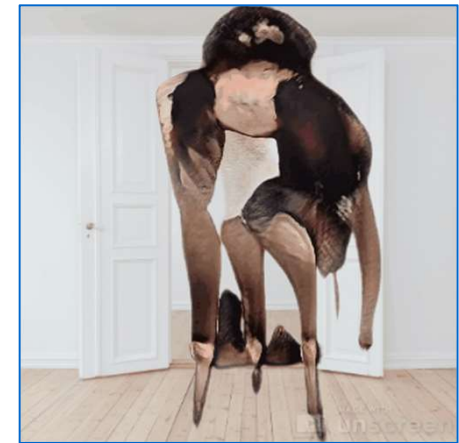


## Bodily distress from predictive processing perspective



## Trailer: Why PP leads to a view of bodily distress as part of “disorders of the embodied self”

- ▶ **A brief reminder:** what is “the self” ?
  - ▶▶ An (inter-)subjective structure with objective enabling conditions
  - ▶▶ Three main aspects:
    - agency,
    - identity
    - self awareness
  - ▶▶ Different levels:
    - minimal self (homeostasis, prereflective self awareness etc.)
    - narrative self (actions, autobiographical identity etc.)
  - ▶▶ Embodied aspects on all levels



© Wikimedia Commons

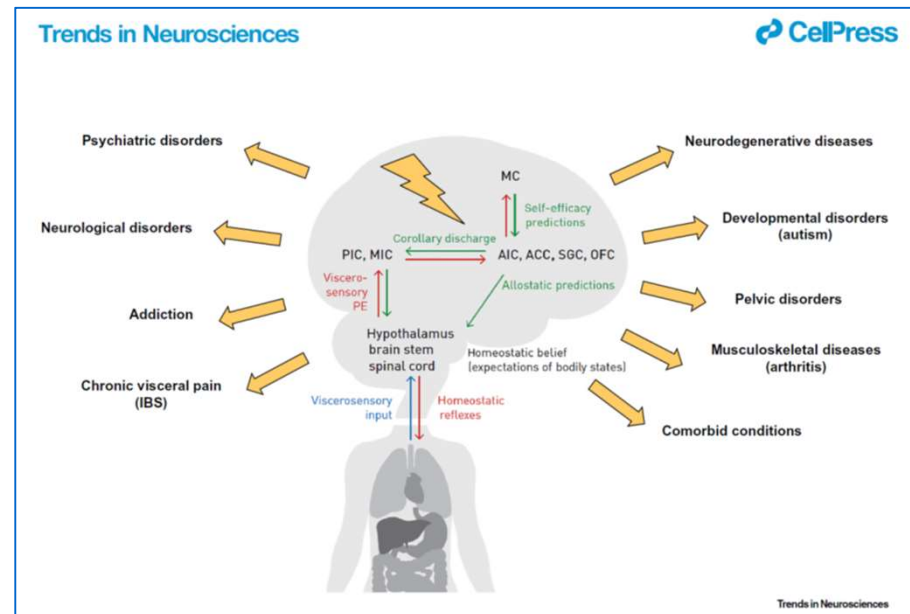
## Trailer: Why PP leads to a view of bodily distress as part of “disorders of the embodied self”

- ▶ **What** are “Disorders of the embodied self” ?
  - ▶ Are they “disorders of interoception”?



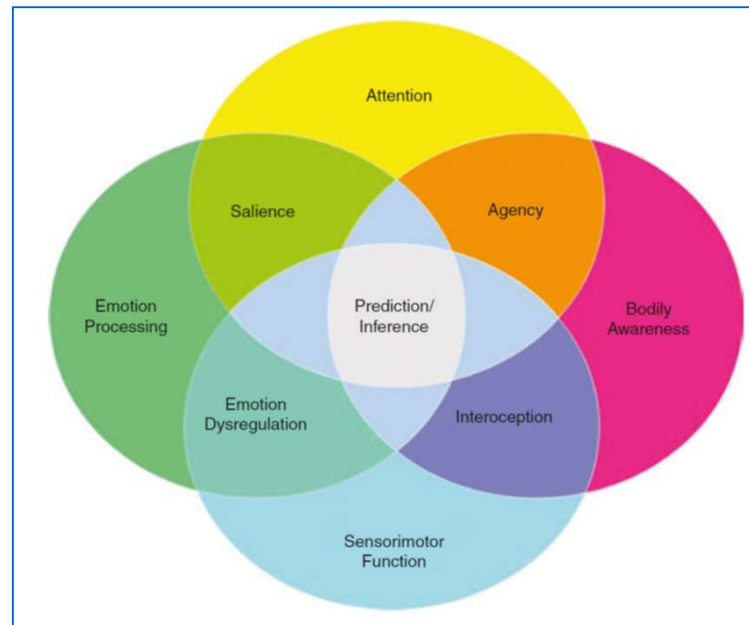
Bonaz B et al. TINS 2021

- ▶ Too sweeping and not comprehensive...



## Trailer: Why PP leads to a view of bodily distress as part of “disorders of the embodied self”

- ▶ **What** are “Disorders of the embodied self” ?
  - ▶ **Rather:** “Disorders of interoception (1) **plus**” !



Drane DL et al.  
A framework for  
understanding functional  
neurological disorder  
CNS Spectr. 2020

## Trailer: Why PP leads to a view of bodily distress as part of “disorders of the embodied self”

### ► What are “Disorders of the embodied self” ?

►► Rather: “Disorders of interoception (1) plus” !

►► i.e. plus disorders of

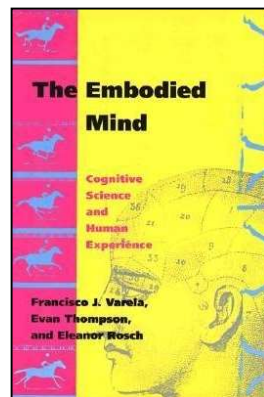
- (2) body image
- (3) body schema
- (4) agency
- (5) body-oriented behavior
- (6) body organ physiology/ anatomy
- (7) self-concept and interpersonal behavior

### Examples:

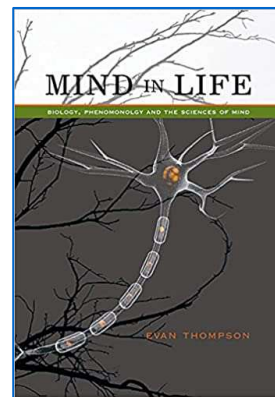
- Bodily distress disorders involve (1), (7), often (3) to (5)
- Eating disorders involve (1), (2), (5), and (7)
- Multiple sclerosis with fatigue involves (1), (4), (6), and (7)

## Trailer: Why PP leads to a view of bodily distress as part of “disorders of the embodied self”

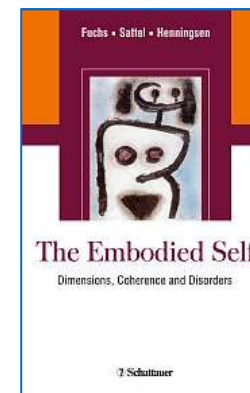
- ▶ **Why** a lumping approach like “Disorders of the embodied self” ?
  - ▶ Conceptually coherent with PP perspective (integrative, interactive, intentional)



Varela F et. al.  
MIT Press 1992



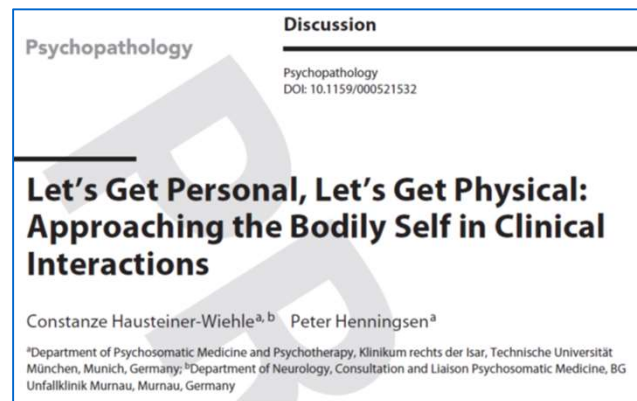
Thompson E  
Harvard UP 2007



Fuchs T, Sattel H,  
Henningsen P  
Schattauer 2010

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- ▶ **Why** a lumping approach like “Disorders of the embodied self” ?
  - ▶ Conceptually coherent with PP perspective (integrative, interactive, intentional)
  - ▶ Clinically relevant (integrative diagnostics, multimodal intentional therapy)

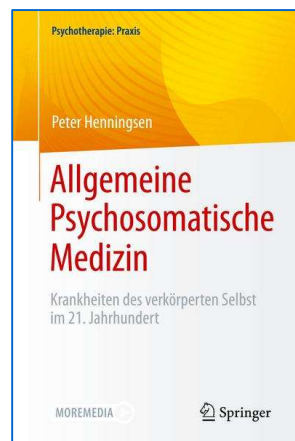


Hausteiner-Wiehle C, Henningsen P.  
Psychopathology 2022



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- ▶ **Why** a lumping approach like “Disorders of the embodied self” ?
  - ▶ Conceptually coherent with PP perspective (integrative, interactive, intentional)
  - ▶ Clinically relevant (integrative diagnostics, multimodal intentional therapy)
  - ▶ Opens up important transdiagnostic research perspectives
  - ▶ Strategically helpful against reductionist biologicistic trends also in psychosomatics
    - “embodied self” maintains focus on subjective and interpersonal aspect



Peter Henningsen

General Psychosomatic  
Medicine

Disorders of the embodied  
self in 21st century

Springer Verlag 2021

## My conclusions

- ▶ Psychosomatic Medicine is the most interesting field in medicine...
- ▶ ...and Computational Psychosomatics is good for the patient...;-)



Thank you from Munich!



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