Richard D. Lane, M.D., Ph.D.
Professor of Psychiatry,
Psychology and Neuroscience
The University of Arizona
Tucson, Arizona

Memory Reconsolidation, Emotional Arousal and the Neuroscience of Enduring Change: Implications for Psychoanalysis


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Lecture #7
Clinical Manifestations of Lower Emotional Awareness: Integrating Defense and Deficit Views

- Defense and deficit perspectives
  - Defenses can be classified as mature and immature
  - Immature defenses are hypothesized to involve a deficit in mental representation capacity
  - For immature defenses, the deficit and defense accounts may be different versions of the same thing
- Neural basis of mature and immature defenses
  - mature: repression
  - immature: dissociation, somatization, splitting, projective identification
- A computational neuroscience perspective may be helpful

Integrating Defense and Deficit Accounts of Reduced Emotional Awareness

- Psychodynamics fundamentally refers to the influence of unconscious mechanisms on behavior
- Something can be unconscious because it is actively kept out of awareness; this is defense
- The other option is that mental contents fail to reach conscious awareness due to a deficit (e.g. failure to construct)
- Thesis 1: The critical issue is whether something has been previously mentally represented (constructed) or not
- Thesis 2: For immature defenses, defense (motivated avoidance) and deficit (impaired mental representation) may be the same
- Thesis 3: Defenses are more likely when deficits are present

The Concept of a Defense

- Motivated avoidance of an undesirable internal state
- The state has typically been previously mentally represented and can be recognized as threatening
- Unpleasant emotional arousal, either activated or latent (potential), triggers avoidance
- Traditionally a defense is deployed by the ego, which mediates between drive demands and requirements of the external world
- How the ego actually “decides” what to do is unclear

Mature vs. Immature Defenses

- Mature defenses involve the ability to mentally represent an emotional state that is not acknowledged
- I'm *not* upset because… (what is not experienced is well defined)
- Examples of mature defenses: rationalization, intellectualization, displacement, isolation of affect
- If the defense is overcome, the emotion can be acknowledged
- Thesis: Immature defenses involve failed mental representation
- Examples of immature defenses: dissociation, somatization, splitting, projective identification
- If the defense is overcome, the emotional state still needs to be represented or formulated, which requires special interventions

Table 1. Defense mechanisms: hierarchy of mature/cognitively oriented and immature/emotionally driven mechanisms of defense according to psychoanalytic theory

Mature/cognitively oriented mechanisms of defense	
Intellectualization	Dealing with emotional stressors by excessive use of abstract thinking or complex explanations to control or minimize disturbing feelings.
Rationalization	Dealing with emotional stressors by inventing a socially acceptable or logical reason to justify an already taken unconscious emotional action.
Repression	Moving thoughts unacceptable to the ego into the unconscious, where they cannot be easily accessed.
Displacement	Dealing with emotional stressors by redirecting emotion from a 'dangerous' object to a 'safe' object.
Isolation	Dealing with emotional stressors by splitting off the emotional components from a difficult thought. The mechanism of isolation is commonly overutilized by people with obsessive-compulsive personalities.
Reaction formation	Dealing with emotional stressors by converting an uncomfortable feeling into its opposite.
Identification	Occurs in various stages of development, in particular in its role as an intrinsic part of object relationships. Serves the function of structure building and makes it possible to deal with separations from loved objects. Plays a role in some types of conversion.
Identification (with the aggressor)	By becoming an aggressor towards others, one avoids becoming a victim of aggression.
Idealization	Dealing with emotional stressors by overestimating the desirable qualities and underestimating the limitations of a desired object.
Introjection	Dealing with emotional stressors by internalizing the values or characteristics of another person; usually someone who is significant to the individual in some way.
Projection	The opposite of introjection. Attributing one's own emotions or desires to an external object or person.
Immature/emotionally driven mechanisms of defense	
Somatization	Dealing with emotional stressors by physical symptoms involving parts of the body innervated by the sympathetic and parasympathetic systems.
Derivatives of self/nonself loss of boundaries	
Dissociation	Temporary and drastic modification of one's self-image to avoid emotional distress. Disconnection from full awareness of self, time and/or external circumstances. Often connected with childhood trauma and posttraumatic stress disorder.
Projective identification	Repeated cycle of projection and introjection: hateful impulses are projected onto the significant other who becomes the bad object. Some of the bad impulses are still retained in the self; they are reinforced by taking into one's self, introjecting, what has originally been projected onto the object.
Psychotic introjection	Psychotic internalization of the object to overcome overwhelming anxieties of loss.
Psychotic projection	Hallucinatory and paranoid externalization of inaccessible thoughts and their connected affects.
Splitting	Splitting off and rejecting parts of the object image and/or of one's own body.
Fragmentation	Reflects a primitive stage in psychic development, preceding the formation of part self and part object images. Breaking up of the self or the object image into components which may operate independently.
Denial	Dealing with emotional stressors by failing to recognize obvious implications or consequences of a thought, act or situation.
Catatonia	Psychomotor syndrome showing a specific constellation of affective, behavioral and motor symptoms. Sensorimotor regression reflecting an immature mechanism against the uncontrollable overflow of anxieties.
Autism	Extreme withdrawal and avoidance of contact and interpersonal relationships to overcome overwhelming anxieties of losing one's own self when near the object.

The Three Process Model of Emotional Awareness

Emotion

1528-3542/17/$12.00 http://dx.doi.org/10.1037/emo0000376

The Structure of Emotional Experience and Its Relation to Trait Emotional Awareness: A Theoretical Review

Ryan Smith, William D. S. Killgore, and Richard D. Lane
University of Arizona

- Affective response generation
- Affective response representation
- Cognitive control of conscious access

Smith R, Killgore WD, Lane RD. The structure of emotional experience and its relation to trait emotional awareness: a theoretical review. Emotion 2018; 18(5), 670.

Defense vs. Deficit

Defense

Unearthing buried treasure
Previously mentally represented
Actively hiding something old
Bringing it to the surface

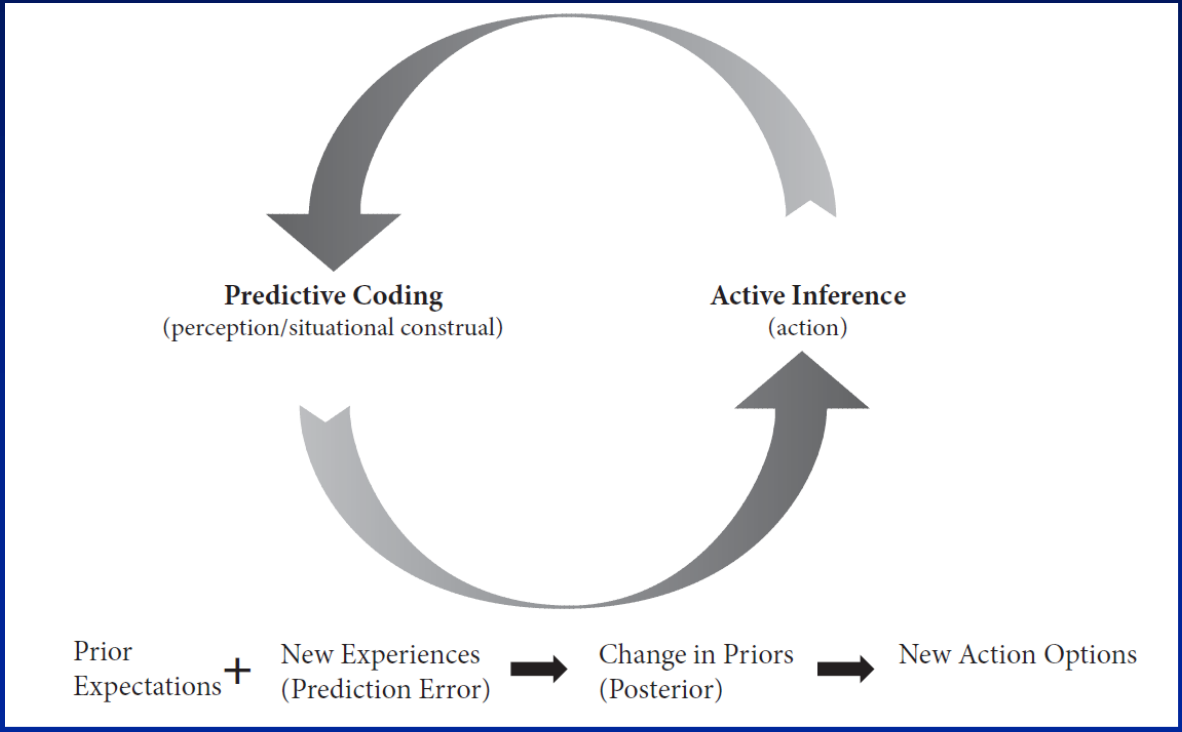
Skill / Deficit

Finishing something incomplete
Not previously mentally represented
Formulating something new
Bringing it to a higher level

Defenses vs. Deficits: Differences in Assumptions and Perspectives

- Defenses
  - All humans share the same basic emotion capabilities
  - Experiences vary as a function of the defenses used
  - People differ in the maturity of the defenses they use to avoid emotional pain
  - Pervasive use of immature defenses results in limitations in adaptation and clinical dysfunction
- Skill / Deficit
  - Rudimentary emotional responses are inborn but the capacity to make sense of and experience emotions is learned
  - Emotional awareness is a cognitive skill or capability
  - People vary in the development of this skill or capability
  - This developmental line bridges normative and clinical domains

Computational Neuroscience Framework in Psychotherapy: Perception and Action Are Inter-Related



Perception and action are highly inter-related:

The way we perceive situations influences the action options available

The actions we select influence what we perceive, both interoceptively and exteroceptively

Actions can consist of overt behavior or cognitive actions

Before an action is selected, the sensory consequences of a range of options are anticipated

A computation is performed outside of awareness that weighs the options

The action selected in a given circumstance is determined by consideration of two factors: instrumental and epistemic

How Are Actions Selected?

- Two mathematical terms determine which actions have the highest value (lowest expected free energy)
- Instrumental: maximize current positive emotion by minimizing the deviation between expected and preferred outcomes (if what you expect is very bad, a less bad option is preferred)
- Epistemic: maximize information gain, which increases confidence in which future actions will lead to preferred outcomes later (therapist encourages new actions)

Differences in Low vs. High Emotional Awareness in the Tendency to Attend to Emotional Experience vs. Avoid/Defend

Low Emotional Awareness (impaired mental representation capacity)

- Less able to project into the future (fast Life Hx Strategy)
- Not confident that preferred outcomes are possible
- Focusing on negative emotion is expected to have a bad outcome
- Difference between expected and preferred outcome too large
- Therefore choose short term action that will minimize difference

Higher Emotional Awareness (intact mental representation capacity)

- Longer time horizon, better able to balance short and long term needs
- Preferred state includes the future as well as the present
- Focusing on negative emotion more likely to be balanced by positive
- Focusing on negative emotion now may have payoff in the future
- Attending to negative emotion is less unpleasant and more likely helpful

Conclusion Regarding Role of Mentalization Impairment in Avoidance / Defense

- The issue is whether all instances of lack of awareness can be *completely* explained by defense
- It may be that defenses may always be present, especially if deficits in mental representation exist
- If someone is highly aware (large repertoire of emotion concepts), mature defenses, if present, are easier to overcome
- The perspective offered here is that immature defenses involve deficits in mental representation
- Overcoming immature defenses is more difficult
- Once immature defense is overcome, need to help patients formulate or construct experience in the problematic context

Immature Defenses and Failure of Mental Representation May Be Different Accounts of the Same Phenomenon

- If a person's experience is incoherent, avoidance (defense) is likely
- In the constructivist account, emotion that is not mentally represented is diffuse/undifferentiated; what is sensed may be unmanageable
- If a person can mentally represent, and can make sense of an emotional experience, they are more likely to experience an emotional feeling, and not defend against it
- Conclusion: Defenses or other avoidance strategies are more likely to occur when mental representation deficits are present

Repression

Repressive Coping Style

- The repressive coping style is associated with a tendency to focus on positive emotions and disregard negative
- It has been linked to adverse health consequences
- Evidence supports a "vigilance – avoidance" theory of repressive coping such that these individuals are highly attentive to negative stimuli but then withdraw attention and curtail further processing to reduce arousal
- This is consistent with the concept of defensiveness: the negative affect is mentally represented, but then it is excluded from conscious awareness

Derakshan, N., Eysenck, M. W., & Myers, L. B. (2007). Emotional information processing in repressors: The vigilance–avoidance theory. *Cognition and Emotion*, *21*(8), 1585-1614.

Repressors Relative to Sensitizers Show Reduced Amygdala Responsiveness and Greater Prefrontal Modulation to Fearful Faces

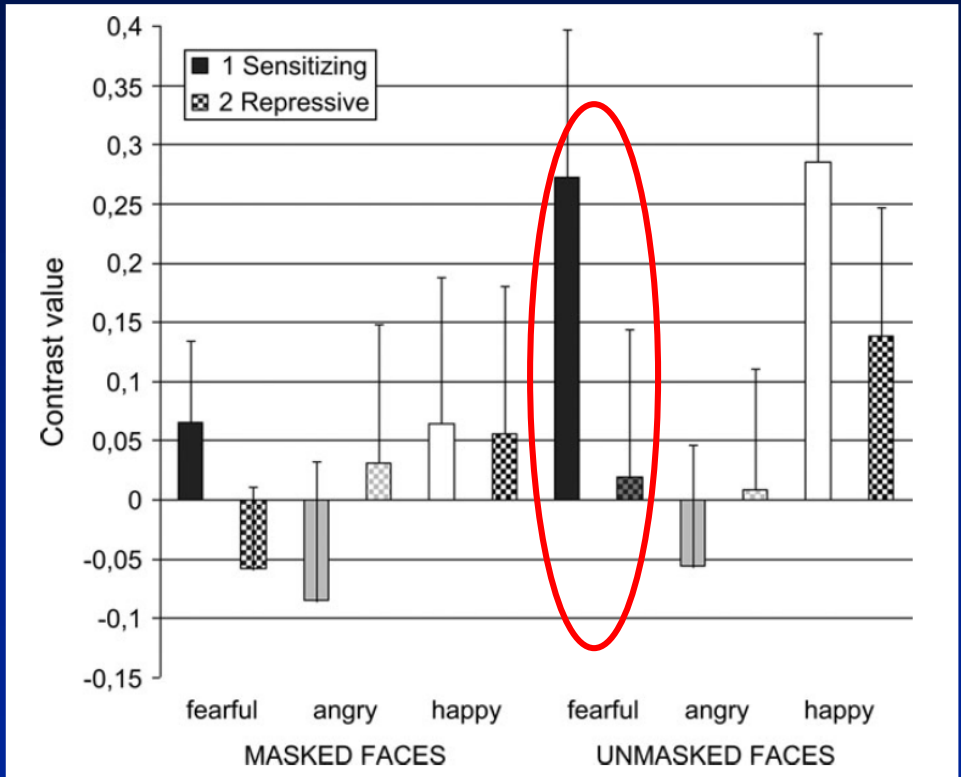
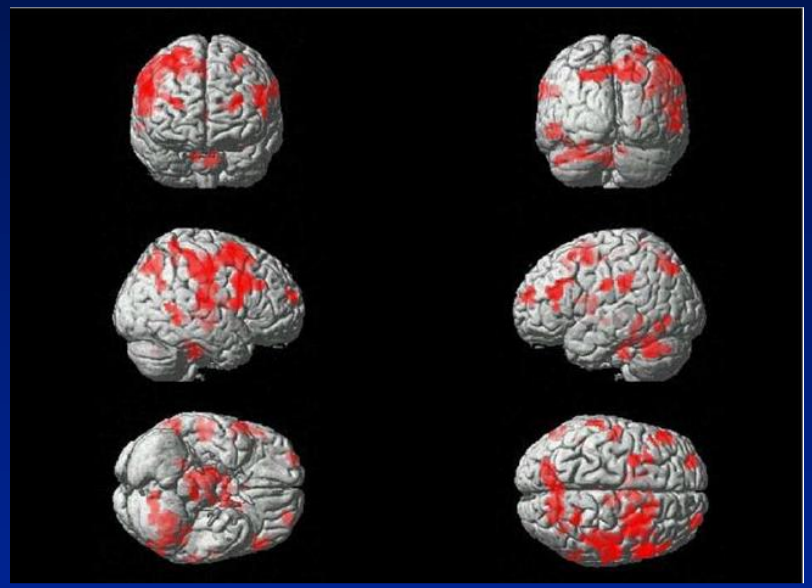


Figure 2. Activation of the amygdala in response to emotion faces compared with neutral faces as a function of coping style, emotion type, and presentation condition (contrast values: means [error bars depict standard error means]).

- The Mainz Coping Inventory was used to identify repressors and sensitizers (n=10 each)
- Repressors showed weaker amygdala responses to unmasked fearful faces than sensitizers
- This pattern was associated with greater covariation with prefrontal cortex, consistent with a top-down inhibitory influence

Rauch, A.V., et al. (2007). Cognitive coping style modulates neural responses to emotional faces in healthy humans: a 3-T FMRI study. *Cerebral Cortex, 17*(11), 2526-2535.

Repressors Show Stronger Cortical Activation During Encoding of Threatening Stimuli Relative to Sensitizers



Between group differences in brain response to angry facial expression compared to neutral faces; Repressors > Sensitizers; all p<.05 (FDR corrected)

- The Mainz Coping Inventory was used to identify repressors and sensitizers (n=20 each)
- Repressors showed stronger cortical responses to encoding of angry vs. neutral faces than sensitizers
- Confirms the assumption of heightened processing of threatening stimuli at an early processing stage in repressors

Rauch, AV et al. (2014). Influence of repressive coping style on cortical activation during encoding of angry faces. *Plos one*, *9*(12), e112398.

Dissociation

2 Distinct Sub-Types of PTSD: Under-Modulation and Over-Modulation

Reviews and Overviews

Emotion Modulation in PTSD: Clinical and Neurobiological Evidence for a Dissociative Subtype

Ruth A. Lanius, M.D., Ph.D.

Eric Vermetten, M.D., Ph.D.

Richard J. Loewenstein, M.D.

Bethany Brand, Ph.D.

Christian Schmahl, M.D.

J. Douglas Bremner, M.D.

David Spiegel, M.D.

In this article, the authors present evidence regarding a dissociative subtype of PTSD, with clinical and neurobiological features that can be distinguished from nondissociative PTSD. The dissociative subtype is characterized by overmodulation of affect, while the more common undermodulated type involves the predominance of reexperiencing and hyperarousal symptoms. This article focuses on the neural manifestations of the dissociative subtype in PTSD and compares it to those underlying the reexperiencing/hyperaroused subtype. A model that includes these two types of emotion dysregulation in PTSD is described. In this model, reexperiencing/hyperarousal reactivity is viewed as a form of emotion dysregulation that involves emotional undermodulation, mediated by failure of prefrontal inhibition of limbic regions. In contrast, the dissociative subtype of PTSD is described as a form of emotion dysregulation that involves emotional overmodulation mediated by midline prefrontal inhibition of the same limbic regions. Both types of modulation are involved in a dynamic interplay and lead to alternating symptom profiles in PTSD. These findings have important implications for treatment of PTSD, including the need to assess patients with PTSD for dissociative symptoms and to incorporate the treatment of dissociative symptoms into stage-oriented trauma treatment.

(Am J Psychiatry 2010; 167:640–647)

Mental Representation Impairment in PTSD: Under-Modulation and Over-Modulation

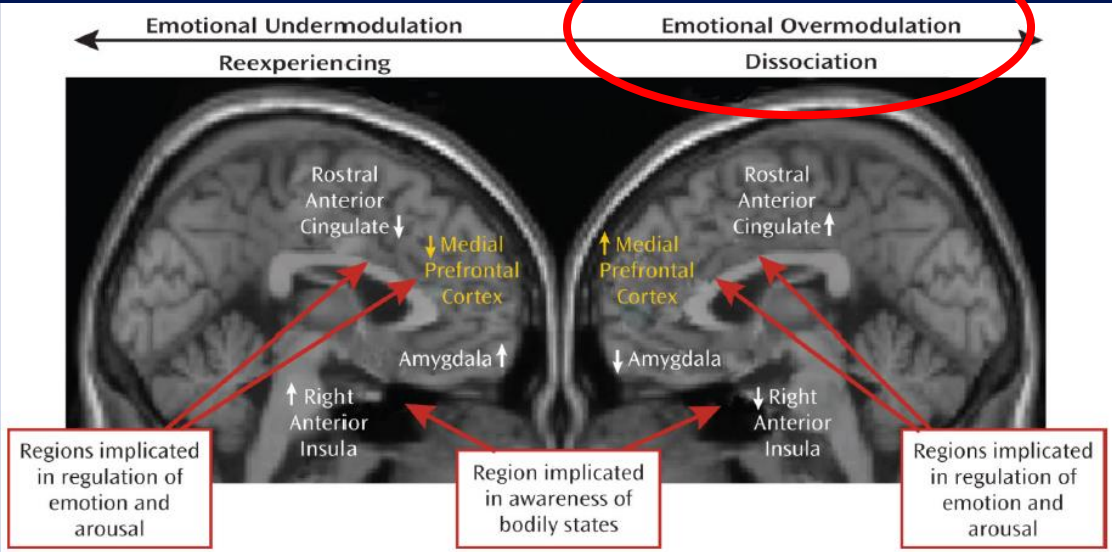
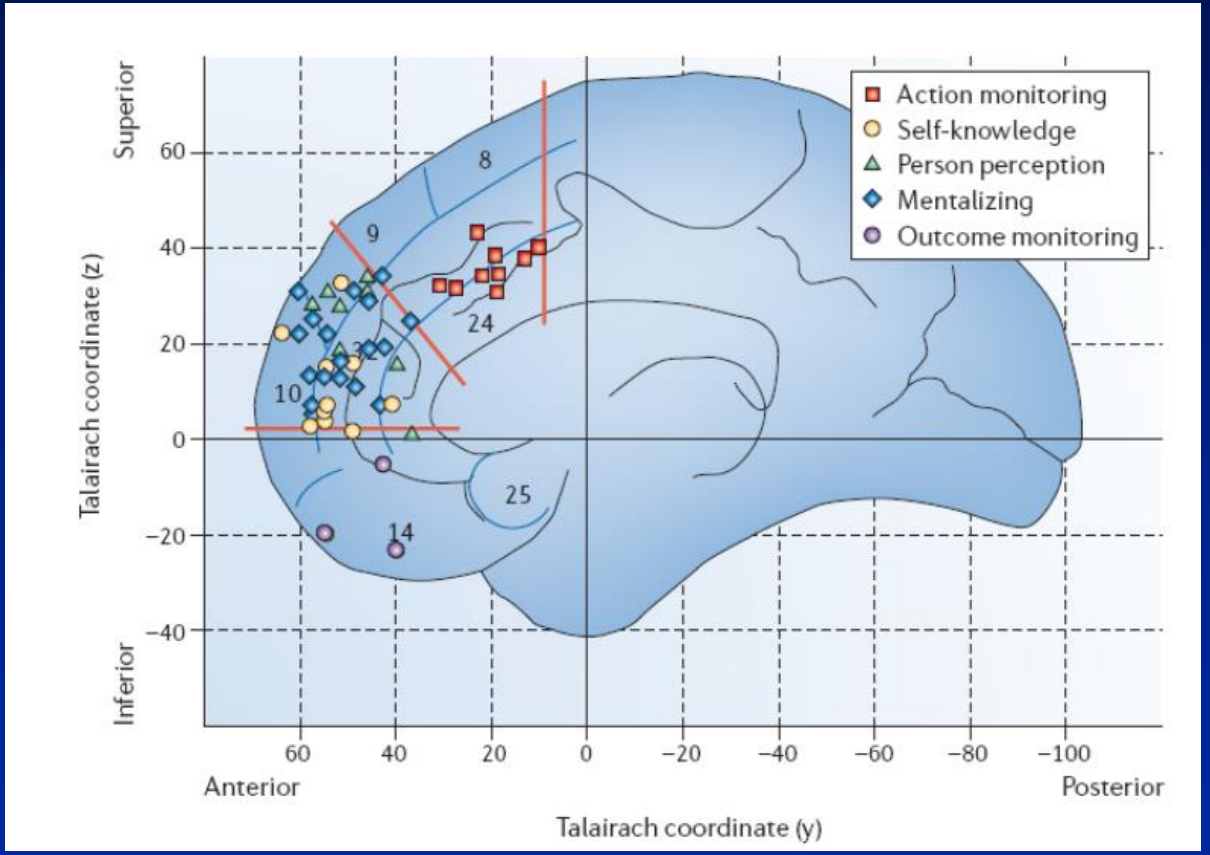


FIGURE 1. A Model of Emotional Under- and Overmodulation in PTSD[a]

[a] In this model, reexperiencing/hyperarousal reactivity to traumatic reminders is viewed as a form of emotion dysregulation that involves emotional *undermodulation*, mediated by failure of prefrontal inhibition of limbic regions. In contrast, the dissociative reactions to traumatic reminders are described as a form of emotion dysregulation that involves emotional *overmodulation*, mediated by midline prefrontal inhibition of the same limbic regions. Figure adapted from Hopper et al. (21). Copyright © 2007 International Society for Traumatic Stress Studies. Reprinted with permission.

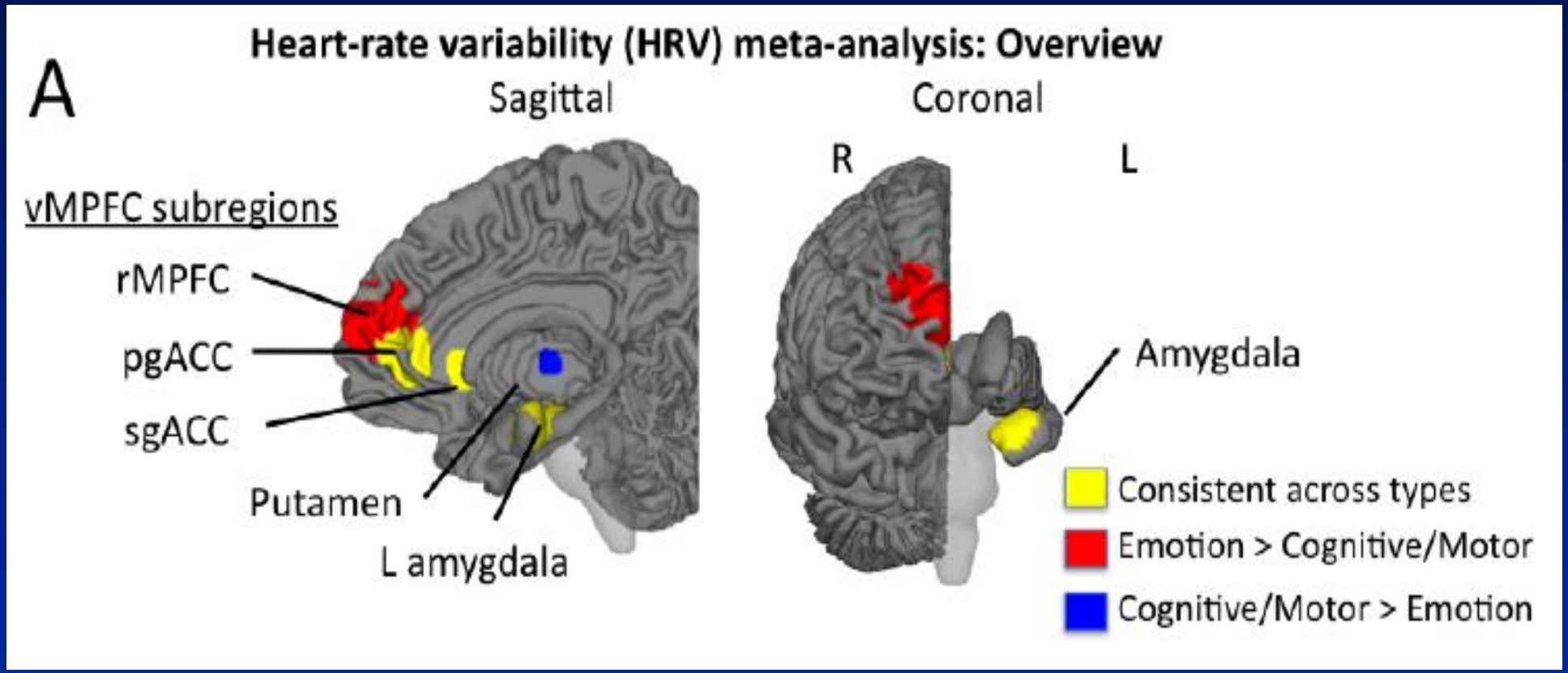
Lanius, R. A., et al. (2010). Emotion modulation in PTSD: Clinical and neurobiological evidence for a dissociative subtype. *American Journal of Psychiatry*, *167*(6), 640-647.

Theory of Mind / Mentalizing



Amodio DM, Frith CD. Nature Reviews Neuroscience 7:268-77, 2006.

Medial Prefrontal Cortex Participates in Regulating Vagal Tone (HRV) Meta-Analysis of 12 studies



Thayer JF, Åhs F, Fredrikson M, Sollers J, Wager TD.
Neuroscience & Biobehavioral Reviews 2012: 36(2): 747-756.

Emotional Numbing in PTSD Associated with Hyper-Arousal

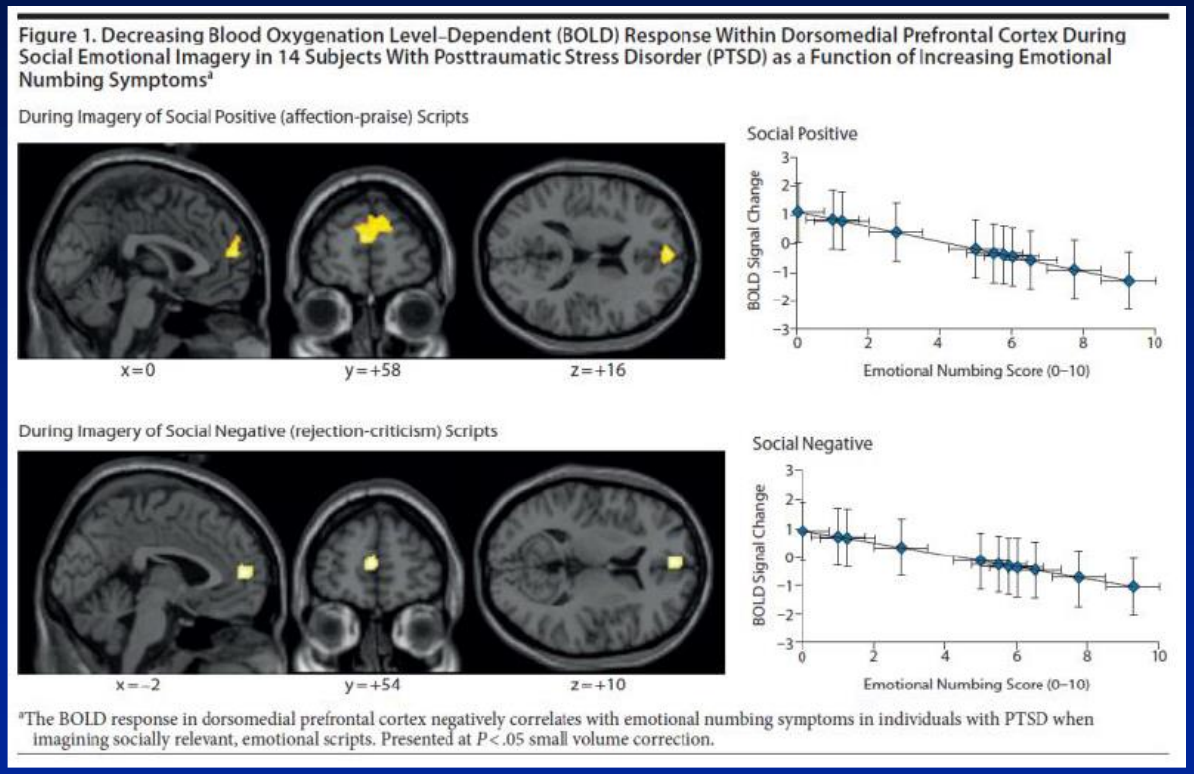
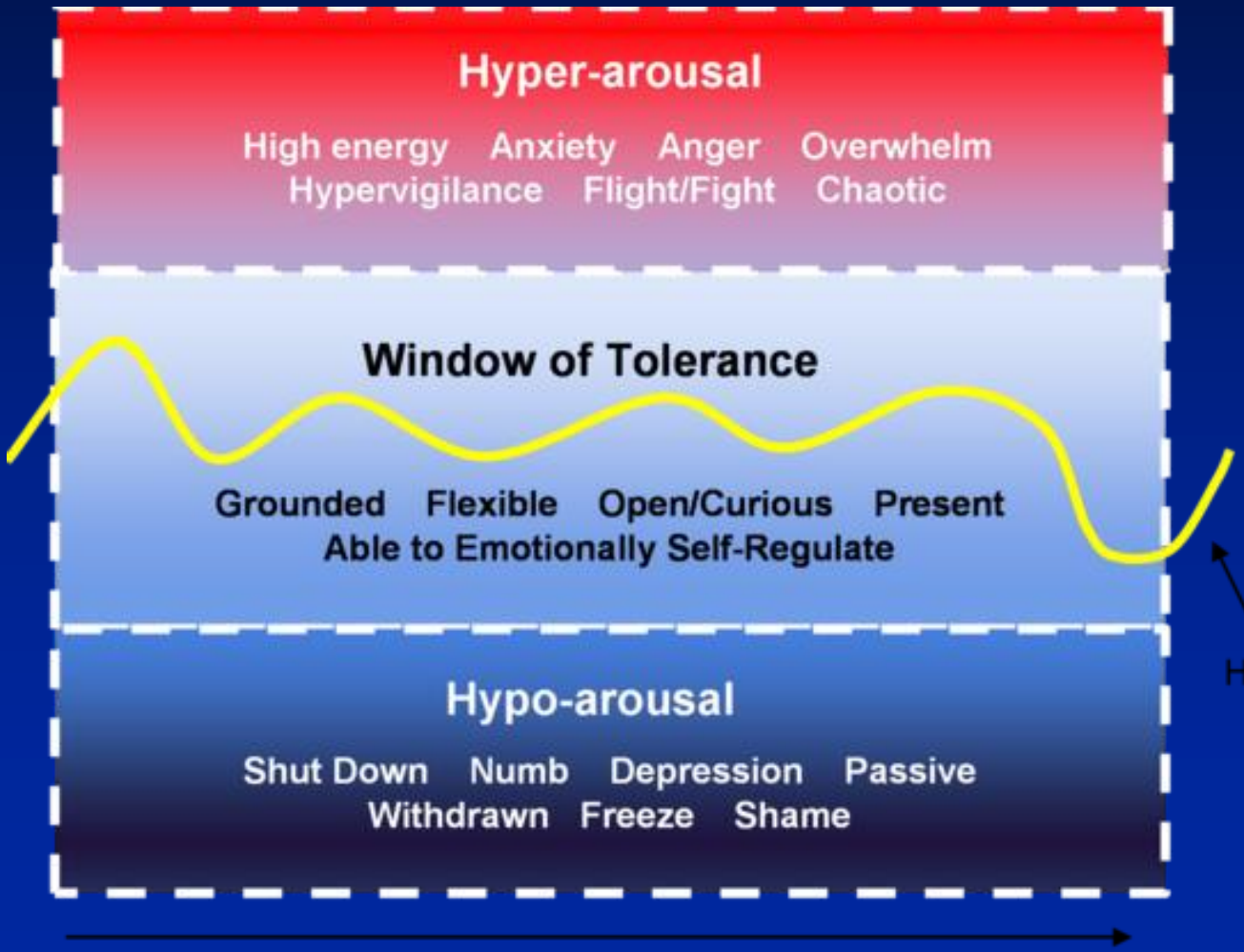


Figure 1. Decreasing Blood Oxygenation Level–Dependent (BOLD) Response Within Dorsomedial Prefrontal Cortex During Social Emotional Imagery in 14 Subjects With Posttraumatic Stress Disorder (PTSD) as a Function of Increasing Emotional Numbing Symptoms[a]

[a]The BOLD response in dorsomedial prefrontal cortex negatively correlates with emotional numbing symptoms in individuals with PTSD when imagining socially relevant, emotional scripts. Presented at $P < .05$ small volume correction.

Frewen, P. A., Dozois, D. J., Neufeld, R. W., Lane, R. D., Densmore, M., Stevens, T. K., & Lanius, R. A. (2011). Emotional numbing in posttraumatic stress disorder: a functional magnetic resonance imaging study. *The Journal of clinical psychiatry*, *72*(4), 6425.

Window of Tolerance



The hyperarousal subtype is associated medial PFC going off-line (process 2)

The hypoarousal subtype is associated with reduced ability to feel because of inhibition of arousal (process 1 & 2)

Window of Tolerance

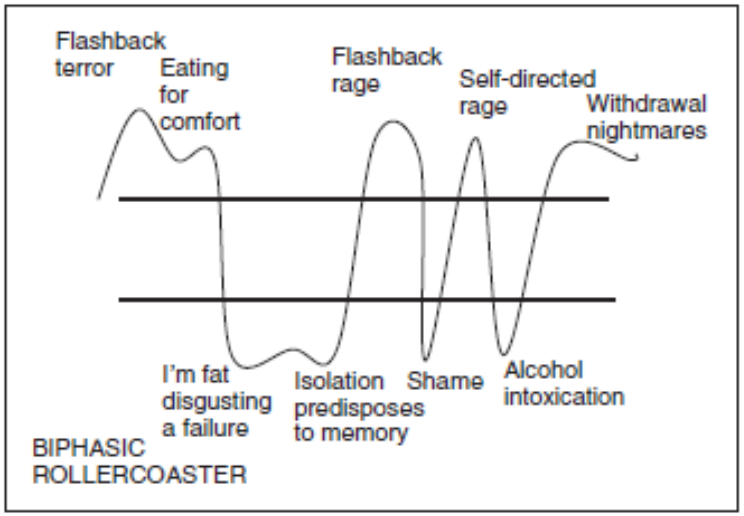


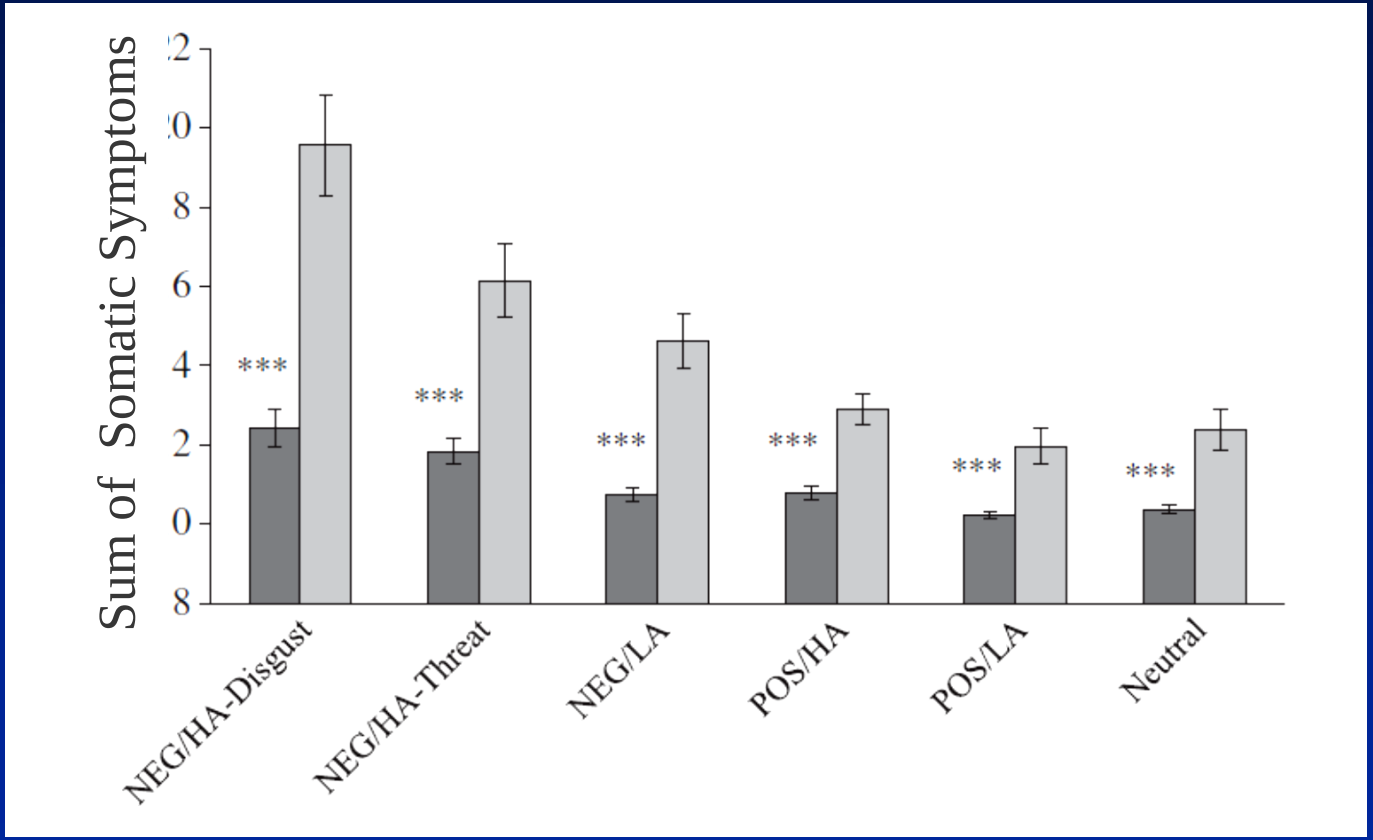
Figure 2. An example of how dysfunctional behaviours can be efforts to regulate distress by a person striving to be within the Window of Tolerance. Eating for comfort to soothe the terror of a flashback is initially helpful but then leads to feelings of shame, self-loathing and worthlessness. This gives rise to suicidal thinking but also to withdrawal and social isolation which make intrusive memories more disturbing. The next flashback is accompanied by rage then by shame at the rage, leading to alcohol intoxication to promote oblivion. Withdrawal from the alcohol leads to a high arousal state in which triggers to further flashbacks with dominant fear or rage will occur, continuing the cycle.

Sympathetic-dominant Hyperarousal: Emotionally flooded, reactive, impulsive, hypervigilant, fearful, angry. Intrusive imagery and affects, racing thoughts Flashbacks, nightmares, high-risk behaviour Efforts to reduce this state may include suicide planning, self harm, compulsive cleaning, abuse of alcohol or opiates	Freeze Mute, terrified, frozen defence responses. High arousal coupled with physical immobility*
Window of Tolerance Optimal arousal zone, encompassing both intense emotion and states of calm or relaxation, in which emotions can be tolerated and information integrated	
Parasympathetic-dominant Hypoarousal: Flat affect, numb, "empty" or "dead" Cognitively dissociated, inability to think Collapsed, disabled defensive responses Helpless and hopeless Efforts to reduce may include suicide planning, self-harm, compulsive	

Corrigan, FM., et al. (2011). Autonomic dysregulation and the window of tolerance model of the effects of complex emotional trauma. *Journal of psychopharmacology*, *25*(1), 17-25.

Somatization

Viewing Affective Pictures *Increases* Somatic Symptom Reporting



LSR

Low Sx Reporting

HSR

High Sx Reporting

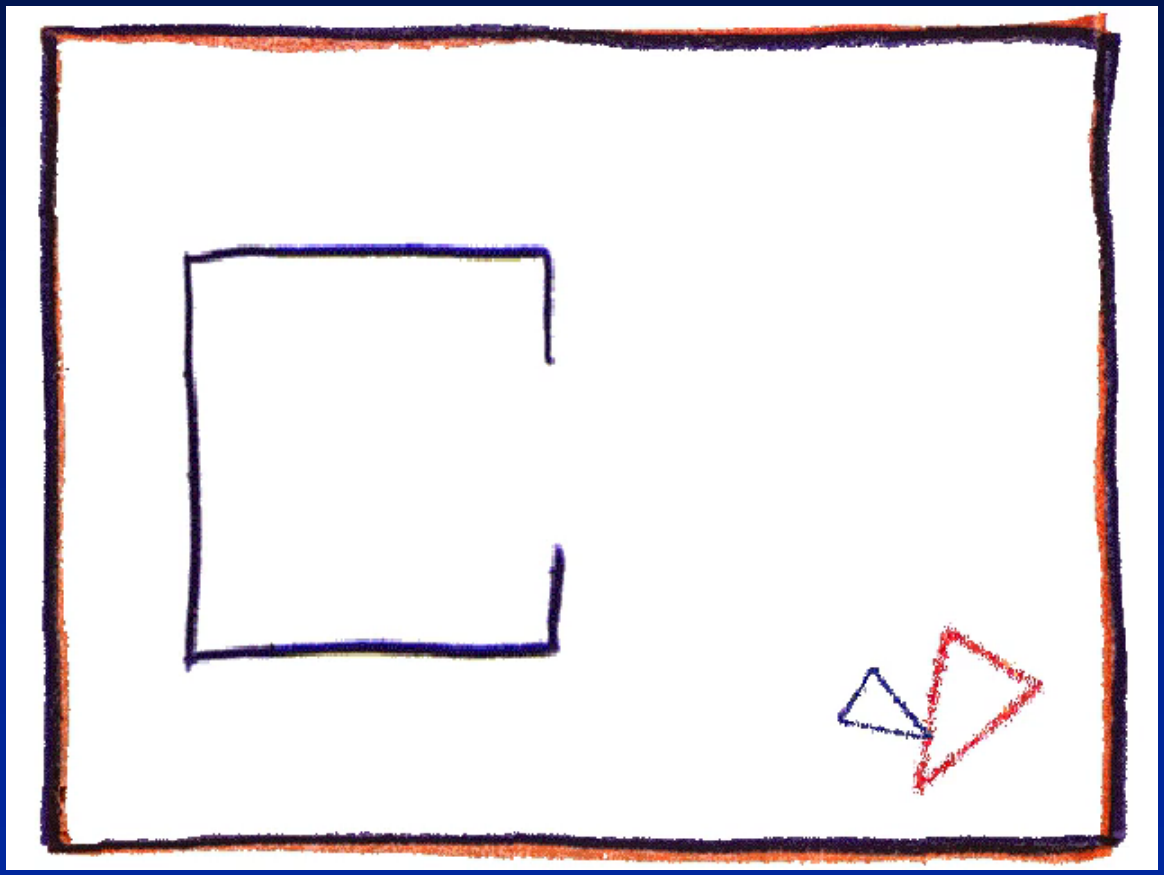
Constantinou, E., Bogaerts, K., Van Diest, I., & Van den Bergh, O. (2013). Inducing symptoms in high symptom reporters via emotional pictures: The interactive effects of valence and arousal. *Journal of psychosomatic research, 74*(3), 191-196.

Is There An Emotion-Specific Mental Representation Deficit in Somatoform Conditions?

- Somatization may arise due to a deficit in detecting and processing internal emotional signals (converting implicit emotion responses into explicit mental representations of emotion).

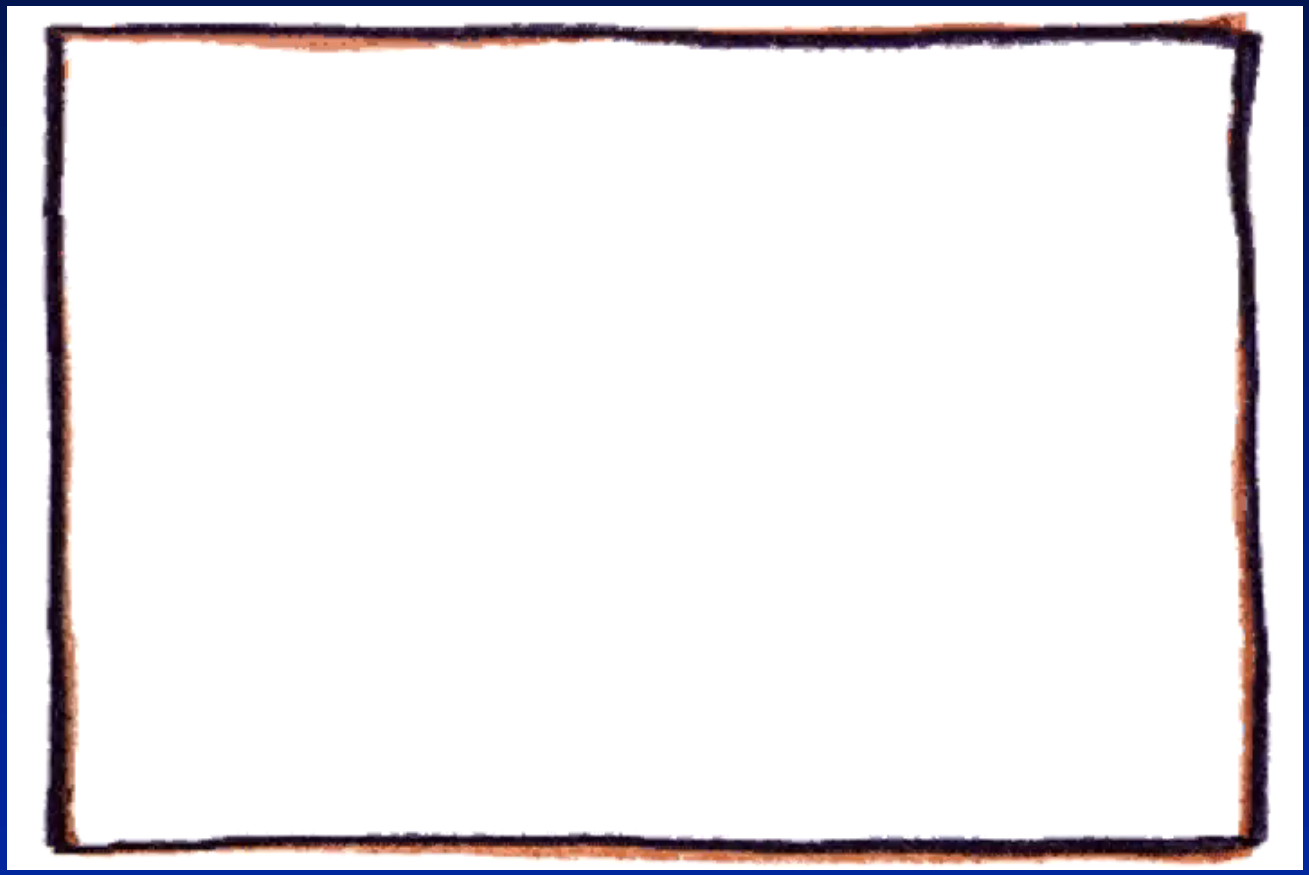
- An exteroceptive task that may capture this deficit is one in which the emotional cues are embedded in the stimuli and are easy to detect and describe, but may go undetected.

Theory of Mind (ToM), Goal-Directed and Random Movement Animations



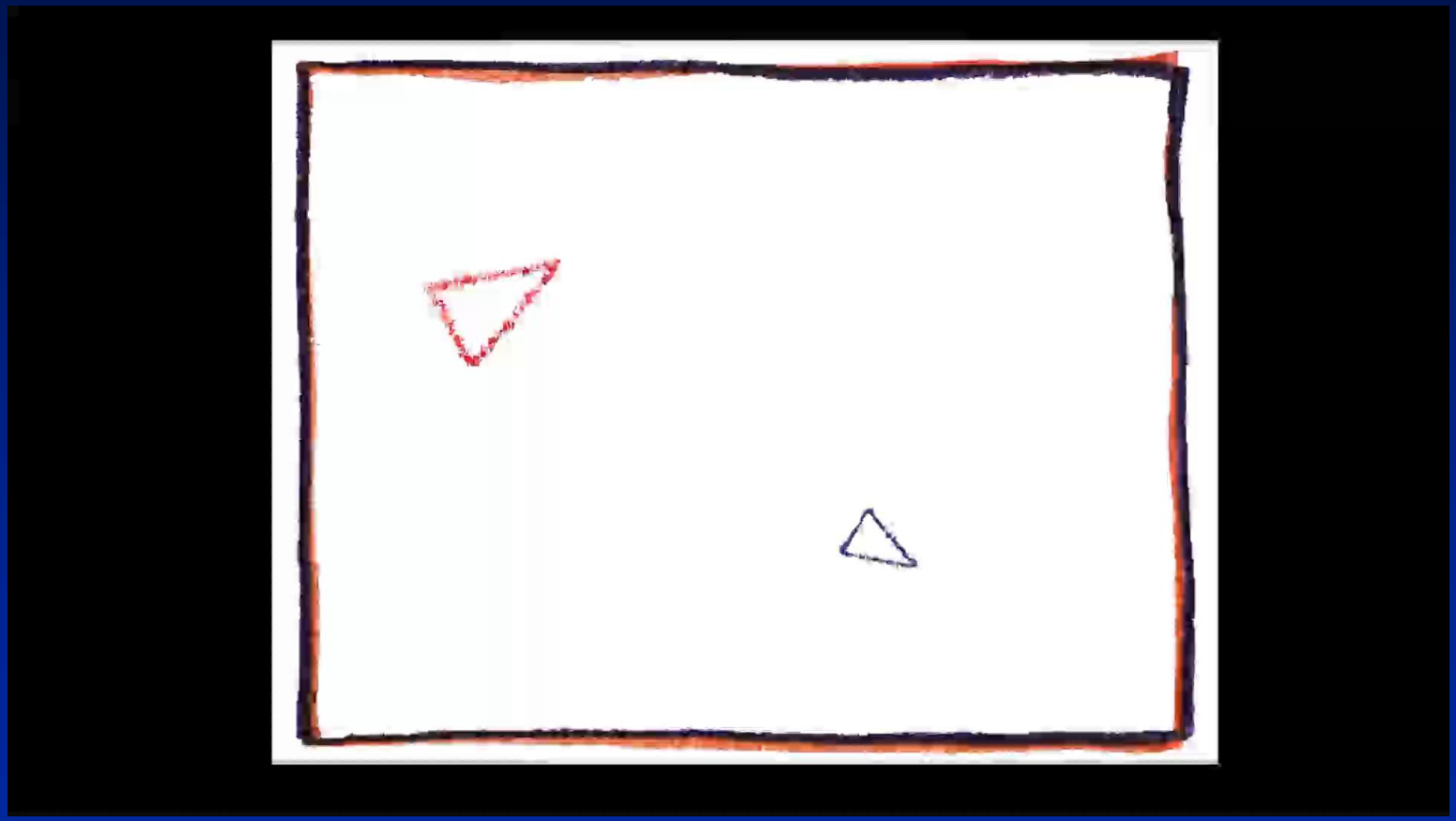
ToM

Theory of Mind (ToM), Goal-Directed and Random Movement Animations



Goal-Directed

Theory of Mind (ToM), Goal-Directed and Random Movement Animations



Random Movement

Study #1 in Germany

Table 3. Emotional awareness as indicated by LEAS scores and the emotional content of AT narratives.

	Patients $n = 30$	**Controls** $n = 30$	**t-test, two-tailed**	**Cohen's d**
LEAS, 10-items[1]	1.93 (0.58)	2.50 (0.62)	$t_{(58)} = 3.68$; $p = .001$ / .003*	$d = 0.95$
LEAS-scoring of Animations[1]**:**				
ToM-L[2]	.78 (.63)	1.20 (.77)	$t_{(58)} = 2.35$; $p = .02$/ .06*	$d = 0.61$
GD-L[2]	.41 (.42)	.52 (.50)	$t_{(58)} = 0.93$; $p = .35$	$d = 0.24$
(ToM-L -GD-L)[2]	.37 (.57)	.68 (.80)	$t_{(58)} = 1.74$; $p = .09$	$d = 0.45$

[1] Means and standard deviations (in parentheses); t-tests for independent groups; [2]ToM-L: Rating of the emotional content of ToM animation narratives according to the LEAS-manual; GD-L: Rating of the emotional content of GD animation narratives according to the LEAS-manual; (ToM-L – GD-L): Difference between ratings of the emotional content of ToM and GD narratives. * denotes Bonferroni correction

Subic-Wrana et al. Psychosomatic Medicine 2010; 72: 404-411.

Emotional Awareness in Patients with Somatic Symptoms

Conversion Disorder (n=29)	Functional Somatic Syndromes (n=30)	Medical Controls (n=30)
Paralysis (n=6)	Chronic pain with somatization (n=4)	Chronic back/leg pain (n=11)
Psychogenic movement dis. PNES (n=17)	Fibromyalgia and/ or IBS (n=23)	Arthritis (n=7)
Psychogenic dysphonia (3)	Cyclic vomiting (n=1)	Diabetic neuro-pathy (n=3)
Other (tingling, blindness, diplopia (n=3)		COPD (n=1)
		Migraine (n=1)
		Pulm HTN (n=1)
		Lyme dis (n=1)
		Musc. Dyst (n=1)

Stonnington et al. J Psychosomatic Research 2013; 74(6):479-85

Emotional Awareness Content in 3 Types of Animation Narratives in 3 Groups

Variable	CD ($\mu^1 \pm SD^2$) (N=29)	FSS ($\mu \pm SD$) (N=30)	Control ($\mu \pm SD$) (N=30)	p-value overall	p-value (CD+FSS vs. C)
Anim-L_RandMvmt	0.13±0.30	0.13±0.31	0.32±0.39	0.05 (0.03)	0.01 (0.01)
Anim-L_GoalDir	0.28±0.37	0.28±0.41	0.58±0.53	0.01 (0.01)	0.003 (0.004)
Anim-L_ToM	1.30±0.90	1.13±0.89	1.68±0.81	0.05 (0.02)	0.02 (0.01)

Patients with conversion disorder (CD) and functional somatic syndromes (FSS) perceive and report less emotional content in animations than medical controls (C) with somatic symptoms.
Stonnington et al. J Psychosomatic Research 2013; 74(6):479-85

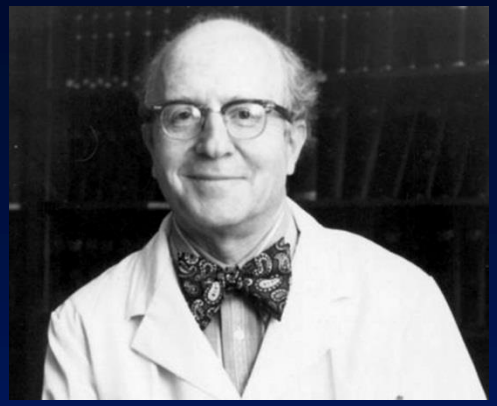
REVIEW

Biased Competition Favoring Physical Over Emotional Pain: A Possible Explanation for the Link Between Early Adversity and Chronic Pain

Richard D. Lane, MD, PhD, Frances Sommer Anderson, PhD, and Ryan Smith, PhD

Psychosomatic Medicine 2018; 80: 880-890

lane@arizona.edu



Created the biopsychosocial model of medical care

Review

"Psychogenic" Pain and the Pain-Prone Patient*

GEORGE L. ENGEL, M.D.
Rochester, New York

- Pain is a psychological, experiential phenomenon requiring participation of higher nervous centers
- Pain may occur without sensory input
- Pain often seems to serve as a kind of *psychic regulator*
  - when a strong aggressive drive is not fulfilled, pain may be experienced instead
  - when guilt is present, pain seems to serve as a kind of atonement
  - when a relationship is threatened or lost, pain serves as a replacement
- In certain pain prone patients, pain seems to substitute for the experience of other *more painful* emotions

Engel GL. American Journal of Medicine 1959: 26 (6): 899-918.

Intentional Painful Self-Injury As a Means to Reduce Emotional Distress

How Might Early Adversity *Amplify* Pain?

- Neglect and abuse in childhood can limit emotional awareness (LHS) predisposing to the somatic experience of emotional distress
- Impaired mental representation of emotion is linked to
  - Decreased mentalization ability
  - Decreased capacity to identify stressors
  - Impaired capacity for attachment
- Unmodulated subcortically-generated implicit affect
  - Decreased vagal tone
  - Enhanced inflammation
- Inflammation promotes allodynia (benign stimuli painful)
- If early adversity involved physical pain, pain is a likely interpretation of ambiguous physical sensations arising from undifferentiated emotional distress

Forgotten negative emotional memories increase pain unpleasantness

- An experimental study with the Think-NoThink-Paradigm-

Stephan Frisch*[a], Steffen Walter*[a], Vanessa Rebhann[a], Sascha Gruss[a], Karl-Jürgen Bär[b], Harald Gündel[c], Richard D Lane[d], Ryan Smith[e]

*contributed equally

[a]Department of Psychosomatic Medicine and Psychotherapy, Medical Psychology, University of Ulm, Ulm, Germany.

[b]Department of Psychosomatic Medicine and Psychotherapy, Jena University Hospital, Jena, Germany

[c]Department of Psychosomatic Medicine and Psychotherapy, University of Ulm, Ulm, Germany.

[d]Department of Psychiatry, University of Arizona; Tucson, Arizona, USA

[e]Laureate Institute for Brain Research, Tulsa, Oklahoma, USA

Learning, Training & Test

A

72 pairs: **72** neutral faces paired with **36** IAPS negativ + **36** IAPS neutral images - including 16 control (8 negative und 8 neutral)

Suppression

B

56 faces (= 16 control excluded)
28 negative: **8** Think and **20** NoThink
28 neutral: **8** Think and **20** NoThink

Recall

C

Verbal description of the formerly paired 72 IAPS images, Identification of forgotten or remembered negative/neutral Think/NoThink stimuli by 3 blinded raters

-> 20 negative NoThink & 20 neutral NoThink images were used in the Think-/NoThink-Pain-Paradigm

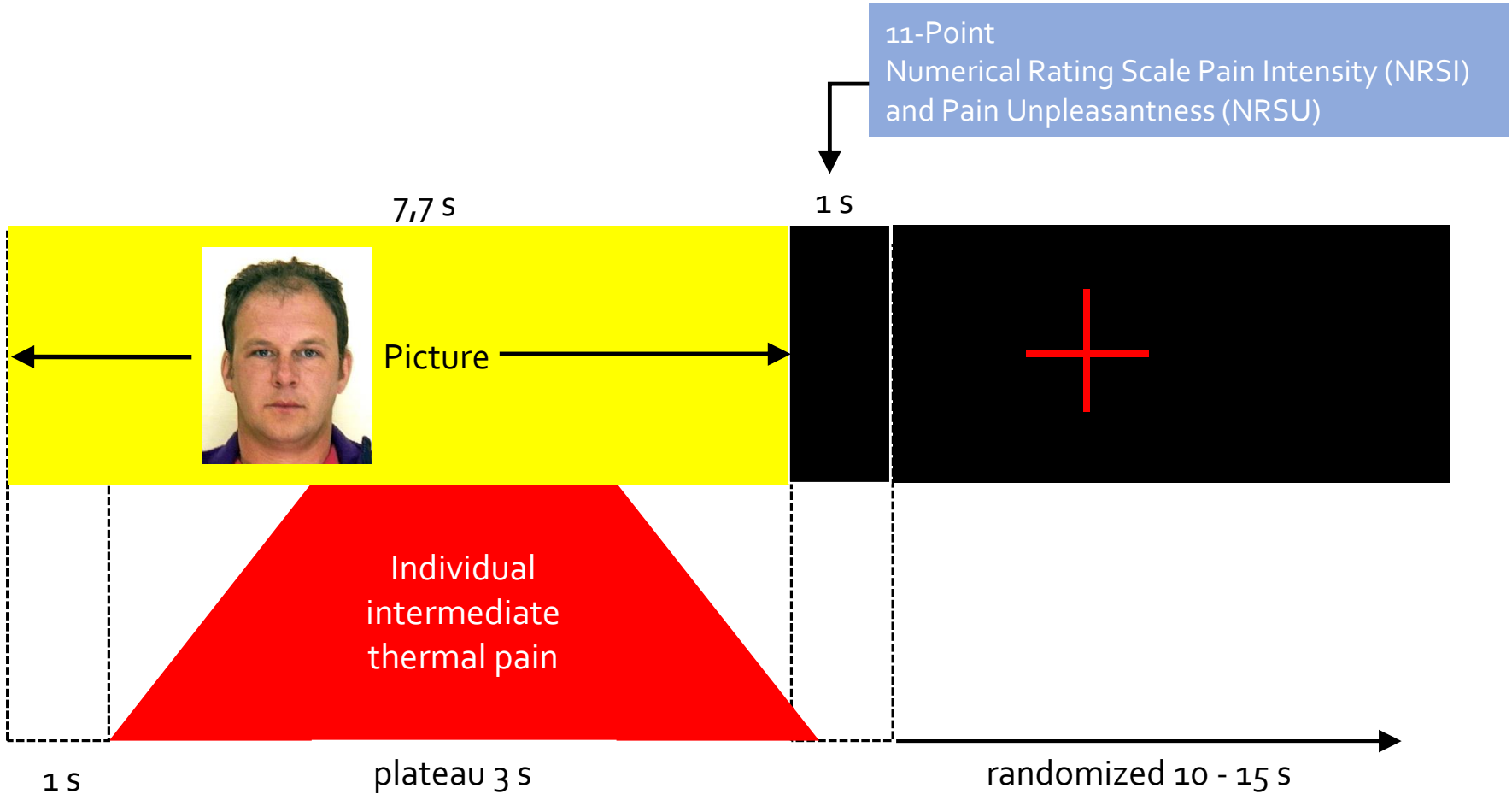


Fig. 2 Think-/NoThink-Pain-Paradigm: combined neutral face image and individual thermal pain stimulation

Pain Unpleasantness Greater in the Forgotten Unpleasant Relative to the Forgotten Neutral Condition

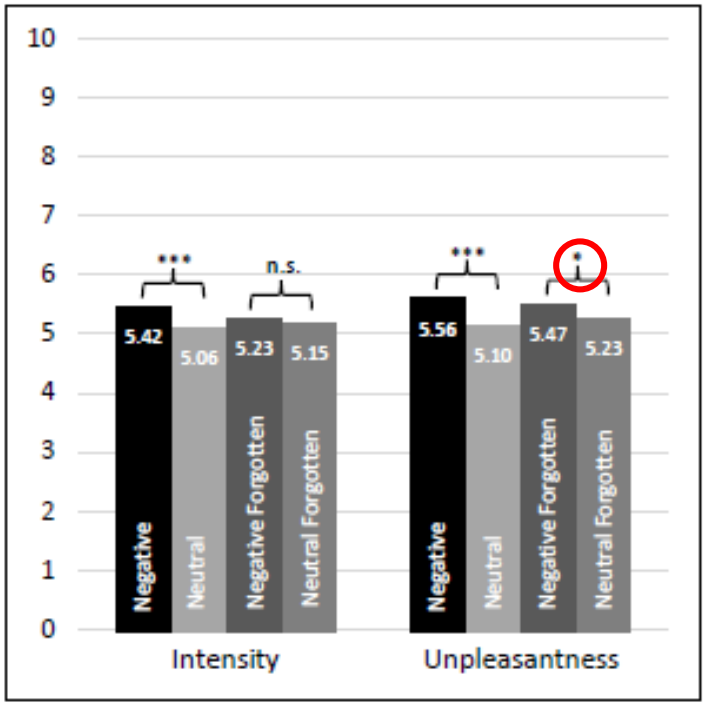


Fig. 3. Pain ratings (mean) of intensity (NRSI) and unpleasantness (NRSU) in the Think/No-Think-Pain paradigm as a function of the neutral, negative, and forgotten conditions. Statistical results are based on a priori planned comparisons using paired t-tests (n.s.=not significant; *p<0.05; ***p<0,001)

Splitting

Mentalization Impairment in Borderline Personality Disorder

Available online at www.sciencedirect.com

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Current Opinion in Psychology

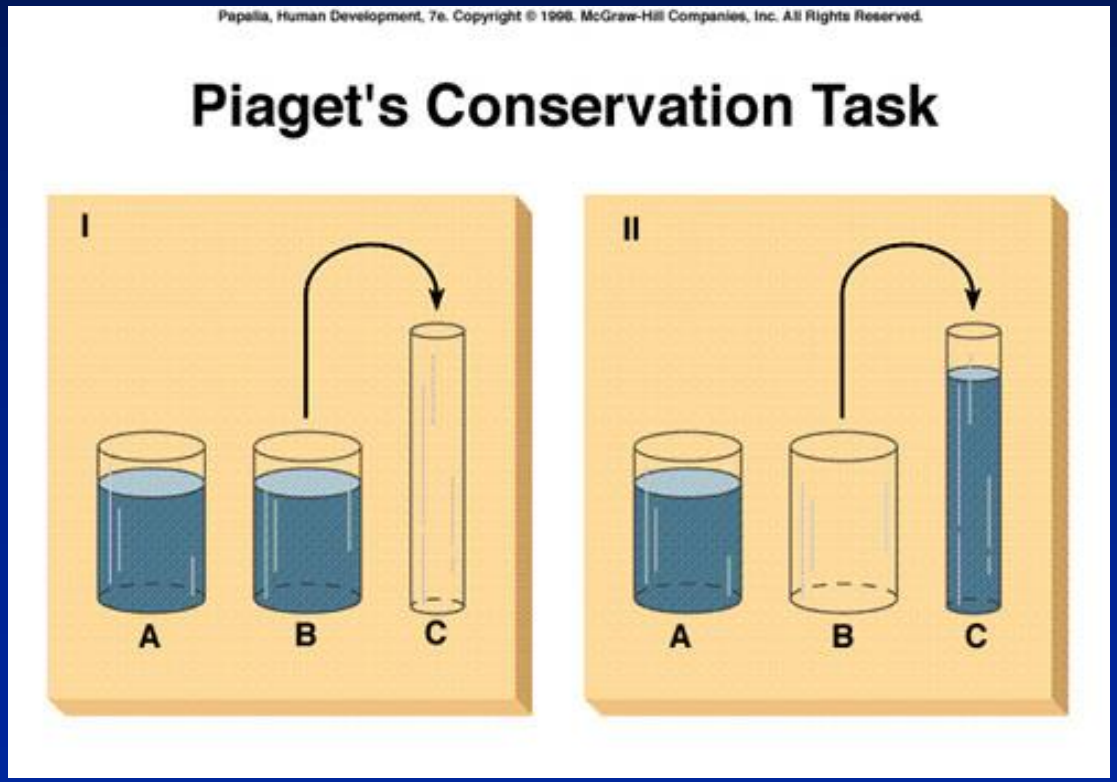
A mentalization-based approach to common factors in the treatment of borderline personality disorder

Anthony Bateman[1], Chloe Campbell[1], Patrick Luyten[1,2] and Peter Fonagy[1]

In this paper we conceptualize borderline personality disorder as a disorder of mentalizing, social cognition, and loss of resilience. Several treatment approaches are effective, and meta-analyses suggest that there are few substantive differences in effectiveness between them and between specialized and non-specialized approaches. We propose that these findings arise because of shared mechanisms of change, congruent with current thinking both about the existence of a general 'p' factor of psychopathology and a reconceptualization of personality disorders as involving a lack of resilience resulting from problems with epistemic trust and salutogenesis, the capacity to derive benefit from the social environment. Effective treatments share the characteristics of consistency, coherence and continuity, qualities particularly relevant to borderline personality disorder. They create the conditions for the reopening of epistemic trust, an essential component in therapeutic change, as it enables the individual to use the experience of being mentalized, to learn mentalizing of others, and then apply and develop these experiences in day-to-day life, which is the basis for meaningful therapeutic change.

Current Opinion in Psychology, 2018, *21*, 44-49.

Conservation of Volume Task: Limitation Due to Phase of Development



- When the water is poured into the tall beaker, 5 yr old children say there is more water in the tall beaker – because the level is higher
- 8 yr old children say the amount of water doesn't change
- They recognize that volume is determined by the product of 2 dimensions, not 1

Milestones in the Development of the Capacity to Report A Blend of Emotions

- Age 5: children report feeling one emotion at a time, and deny being able to experience more than one at a time
- Age 6-8: can describe feeling one emotion followed by another, e.g. I'd feel happy at first, then sad
- Age 8-12: can describe the coocurrence of 2 emotions
- Age 10: can bring two opposite feelings together for different targets
- Mean Age 11.3: able to bring opposite valence feelings together toward a single object
- Implication: If mirroring and contingent responding are deficient, development of this capacity may be compromised

Harter, S. (1986). Cognitive-developmental processes in the integration of concepts about emotions and the self. *Social Cognition* 4:119–151.

If Hemisperic Lateralization for Emotion Exists, Splitting Could Reflect Interference in Communication Between the Hemispheres

- In light of current thinking that emotions are the result of activations across multiple networks (default mode, salience, limbic, motor, perceptual), a simple association between hemisphere and type of emotion is considered outdated
- The best evidence supports a superior role for the right hemisphere in perceiving emotion
- Some evidence exists for the right hemisphere mediating negative emotion/avoidance behavior and the left hemisphere mediating positive emotion/approach behavior
- Meta-analyses of imaging studies do not support this conclusion, but different lateralization patterns within-subjects are possible
- If so, interference in communication across the hemispheres could be associated with lack of integration (splitting)

Patients with Borderline Personality Disorder Show Reduced White Matter Connectivity in the Corpus Callosum and Fornix Relative to Controls

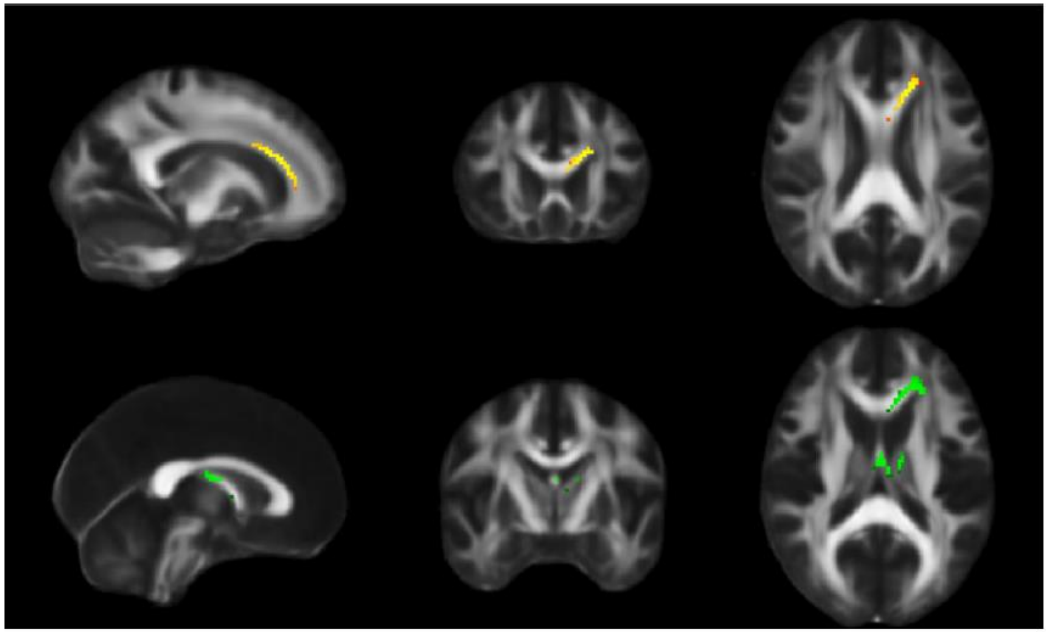
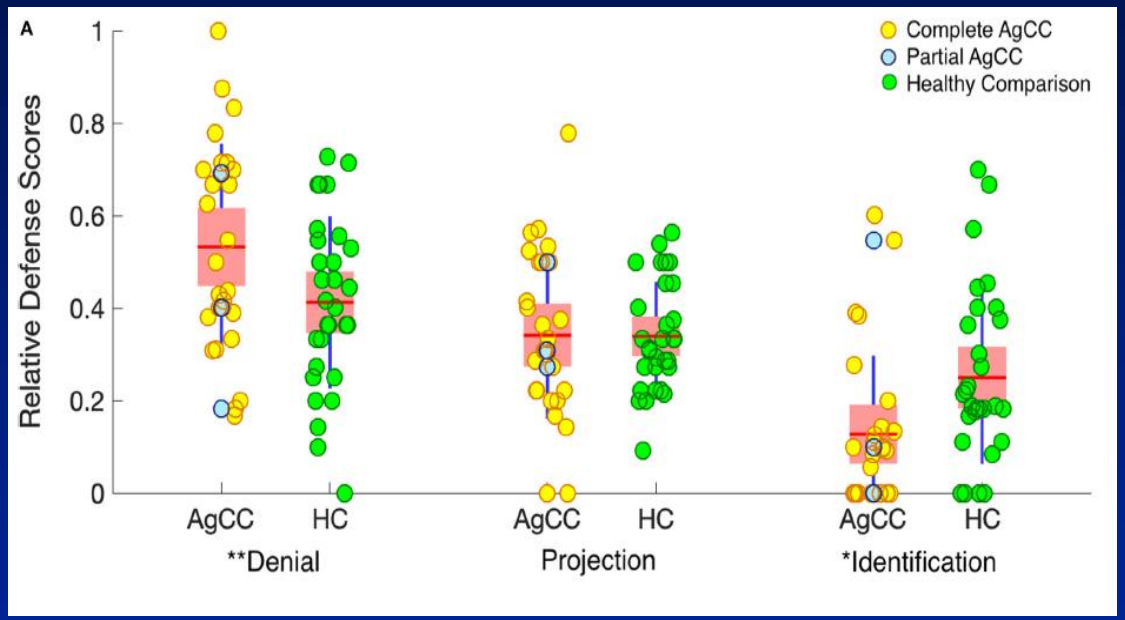


Fig. 2. Results of meta-analysis. Meta-analysis was conducted in Seed-based D Mapping using standardised operations. Pre-processing used a tract-based spatial statistics template and a fractional anisotropy correlational template with an anisotropic value of 1 and smoothing kernel of 20 mm full width at half maximum. Meta-analysis indicated two foci of significant reductions. (Top) Individuals with borderline personality disorder show reduced fractional anisotropy (SDM-Z = −1.473; p = 0.000068665) in the corpus callosum (MNI: −16, 22, 22; voxels = 248) compared to control. (Bottom) Individuals with borderline personality disorder show reduced fractional anisotropy (SDM-Z = −1.368; p = 0.00143230) in the fornix (MNI: 0, −6, −16; voxels = 49) compared to control.

- 123 patients with BPD and 117 controls
- The corpus callosum connects the two cerebral hemispheres to each other (? + and - emotion)
- The fornix connects the hippocampus to mammillary bodies (memory)

Kelleher-Unger, I., Tajchman, Z., Chittano, G., & Vilares, I. (2021). Meta-analysis of white matter diffusion tensor imaging alterations in borderline personality disorder. *Psychiatry Research: Neuroimaging*, *307*, 111205.

Agenesis of the Corpus Callosum (AgCC) Associated with More Immature Defenses



- 27 patients with AgCC were compared to 30 controls
- Narratives from TAT cards were scored for defenses
- Denial – most immature
  Projection – intermediate
  Identification – most mature
- AgCC: more denial, less identification
- CC may play a role in defense

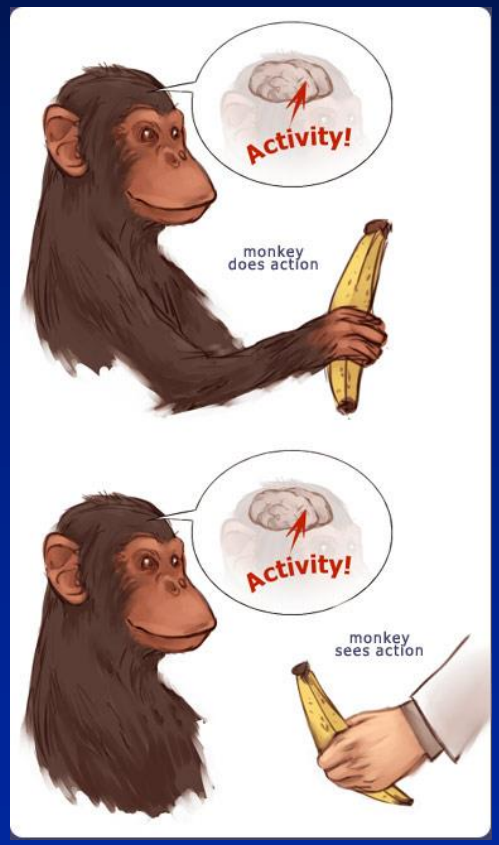
Paradiso, S et al. (2020). Integration between cerebral hemispheres contributes to defense mechanisms. *Frontiers in psychology*, *11*, 1534.

Projective Identification

Projective Identification

- Projection is said to occur when a disowned aspect of oneself is is attributed to someone else; e.g. I'm not angry, you are angry, you are dangerous, therefore I'm afraid of you. Fear is due to projection.
- Projective identification is said to occur when the other person actually takes on the disowned emotion, e.g. in the case above, actually becomes angry
- Projective identification is considered an immature defense that is common in borderline personality disorder
- The question is, How does the emotion get into the other person?
- Thesis: the disowned emotion is not mentally represented but is enacted, and is registered in the observer through a mirror neuron mechanism

Mirror Neurons



Single unit and ensemble recordings of neuronal activity in the monkey brain show the same pattern of spiking activity when an action is performed and when the same action is observed

Gallese, V. (2009). Mirror neurons, embodied simulation, and the neural basis of social identification. *Psychoanalytic dialogues*, *19*(5), 519-536.

Helplessness in the Helpers

- It is not uncommon for medical practitioners to encounter patients who make them feel helpless
- A common context for this is patients with somatic complaints, for which no medical basis can be found
- Such patients often do not accept that the problem is real but functional
- The patient demands help yet rejects all of the clinician's recommendations
- Case studies suggest that the patient feels helpless but does not recognize it
- These studies suggest that earlier in childhood caregivers did not understand what the child needed and were unable to soothe the child
- The current medical situation reactivates this earlier experience
- This understanding enables the clinician to give the patient what they need: validation, support and a plan to restore functioning

Adler, G. (1972). Helplessness in the helpers. *British Journal of Medical Psychology*.

Clinical Application of Mirror Neuron Mechanism in Projective Identification

- We have previously discussed the "implicit process of relational knowing" as the foundation for higher levels constructs such as conflict and defense
- Current psychodynamic thinking emphasizes the inter-subjective emotional field between patient and therapist and a focus on the "here and now"
- We now recognize that "countertransference" is a critical mechanism for the therapist to understand what keeps recurrent patterns recurring
- The therapist can experience what other people in the person's life experience
- The therapist can contain and formulate the feelings induced in the interaction
- Instead of reacting as others do, containment permits mental representation, empathy and the ability to formulate what the patient is experiencing
- This information can be used in the service of empathic conjectures or can inform interventions to produce corrective emotional experiences based on a new understanding of what the patient needs

Conclusions

- Lower emotional awareness is associated with limitations in the mental representation of emotion (although other mechanisms are possible)
- More extreme impairments in EA are associated with the somatic expression of emotion, corresponding to immature defenses: dissociation, somatization and projective identification
- These immature defenses correspond to disorders such as PTSD with dissociation, somatic symptom disorder and borderline PD
- Splitting may consist of a developmental impairment in transitioning from level 3 (1 emotion at a time) to level 4 (blends of emotion)
- Immature defenses and impairments in mental representation of emotion may be different versions of the same phenomenon

Conclusions

- A computational perspective can explain how the potential for disturbing or unmanageable emotions can be anticipated and avoided without awareness
- Such avoidance (defense) may be more likely the more impaired (deficit) the capacity for mental representation of emotion
- It is clinically useful to recognize when impairments in mental representation of emotion exist (e.g. with immature defenses) because it requires special interventions to help the patient formulate / mentally represent that which is being avoided, whereas with mature defenses this is less of an issue
- By examining relevant neural mechanisms and processes, differing conceptualizations at the psychological level can potentially be reconciled at the neurobiological level