

A stylized illustration of a brain and a heart, both with simple faces, connected by a line. The brain is at the top left, and the heart is at the bottom left.

Beslissen vanuit het hart: de rol van emoties in menselijke beslissingsprocessen

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Rationality versus emotion

There is a tension between rationality and emotion. Rationality is about achieving **long term goals** (even long term emotional goals), whereas emotional drives are **immediate**. Punching that rude policeman's face in may seem like a very attractive proposition right now, but logic suggests that longer term this will not increase your emotional well being. The **irrational** person **acts**, the **rational** one **resists**, and the rational one ends up satisfying more of their emotional desires in the longer term. The rational one is no less emotional than the irrational one, just more rational.

(taken from: ChangingMinds.org)

Plato's tripel structuur van de ziel



Components of the soul

Glosses

Components of the state

Cognition

Thought, reason, will.
Considered rational judgment -
the "good".

Ruling class. Philosophers,
kings, statesmen, nobility.
Interested in wisdom.

Emotion/Affect/Passion

"Thumos", anger or spirited
higher ideal emotions,
resenting infringements by
others and lower appetites.

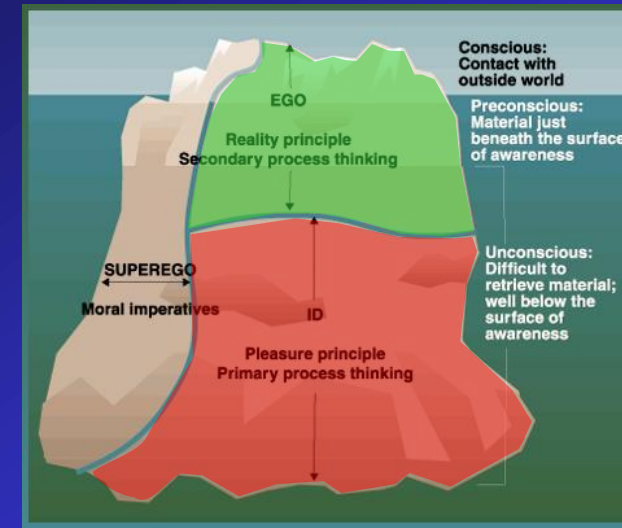
Warrior class. Soldiers,
policemen, auxiliaries, men of
action. Interested in practical
distinction.

Conation/Motivation

Impulses, cravings, instincts,
appetites. Multitude of clamant
and conflicting appetites for
particular gratifications.

Lower classes. Civilians,
workers, peasants, slaves.
Interested in enjoyment and
gratification.

(from Plato, *The Republic*; after Scherer, 1995)



Rationaliteit in weerstrijd met emotie

Cognitie

langzaam

omvattend

objectief

logisch

rationeel

koudbloedig

Emotie

snel

selectief

subjectief

onlogisch

irrationeel

overstuur



Het nut van emotie

1. Hoe we sneller kunnen reageren dan we denken
2. Hoe we intuïtief rationele beslissingen kunnen nemen
3. Hoe we de modus operandus van onze brein door onze stemming controleren



**Hoe we sneller kunnen reageren
dan we denken**

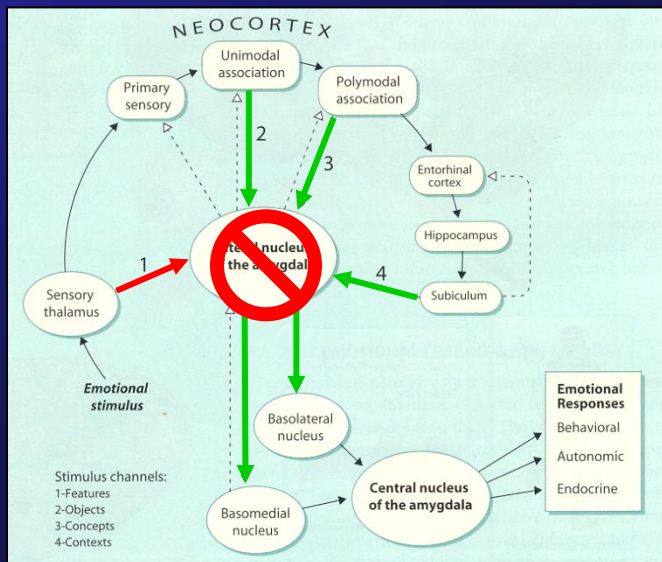
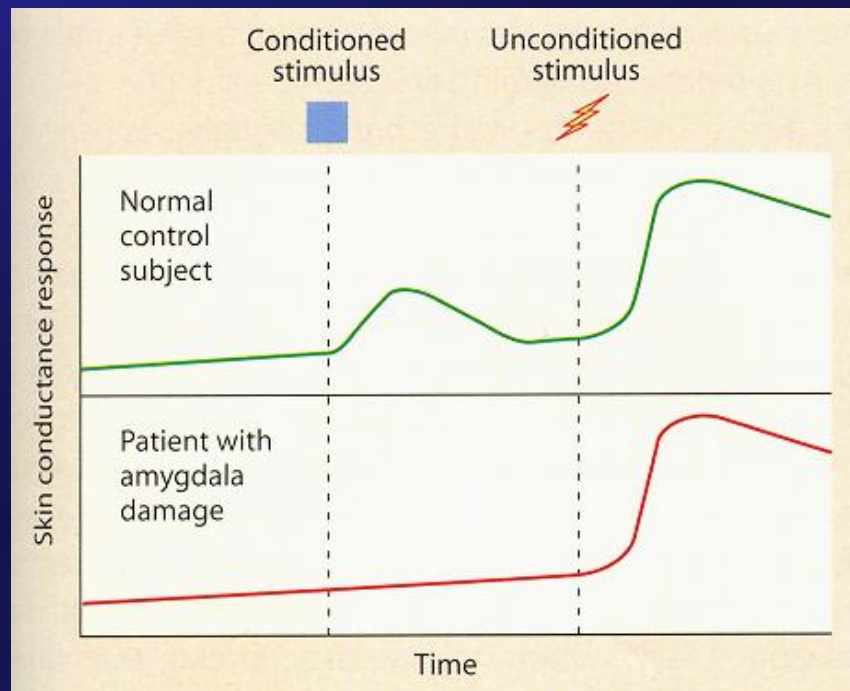


-
- The diagram illustrates the neural pathways of the limbic system, centered around the **Lateral nucleus of the amygdala**. It shows connections to the **Neocortex** (Unimodal and Polymodal association areas), the **Sensory thalamus**, and the **Entorhinal cortex**, which leads to the **Hippocampus** and **Subiculum**. The **Lateral nucleus** also projects to the **Basolateral nucleus** and **Basomedial nucleus**, which then project to the **Central nucleus of the amygdala**. The **Central nucleus** is linked to **Emotional Responses** (Behavioral, Autonomic, Endocrine). Stimulus channels (1-4) are indicated for various inputs.
- Stimulus channels:**
 1-Features
 2-Objects
 3-Concepts
 4-Contexts
- Emotional Responses:**
 Behavioral
 Autonomic
 Endocrine



Amygdala: Impliciet vs. expliciet emotioneel leren

- Geen impliciet leren (fear conditioning) zonder amygdala
- ... expliciet leren (bewuste reactie) niet gehinderd





Hoe we intuïtief rationele beslissingen kunnen nemen

Lohhausen studie (Dörner et al., 1983)

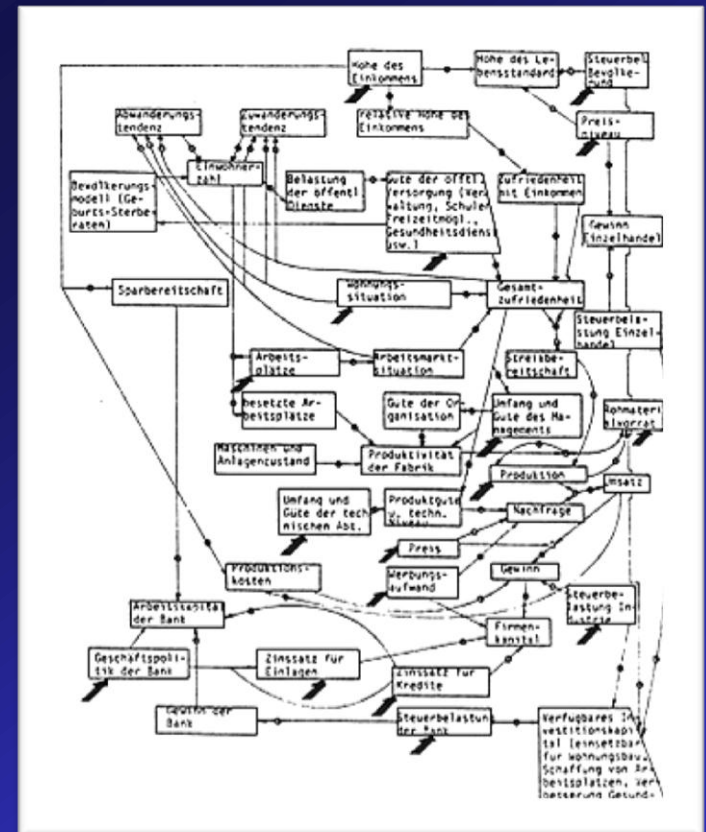
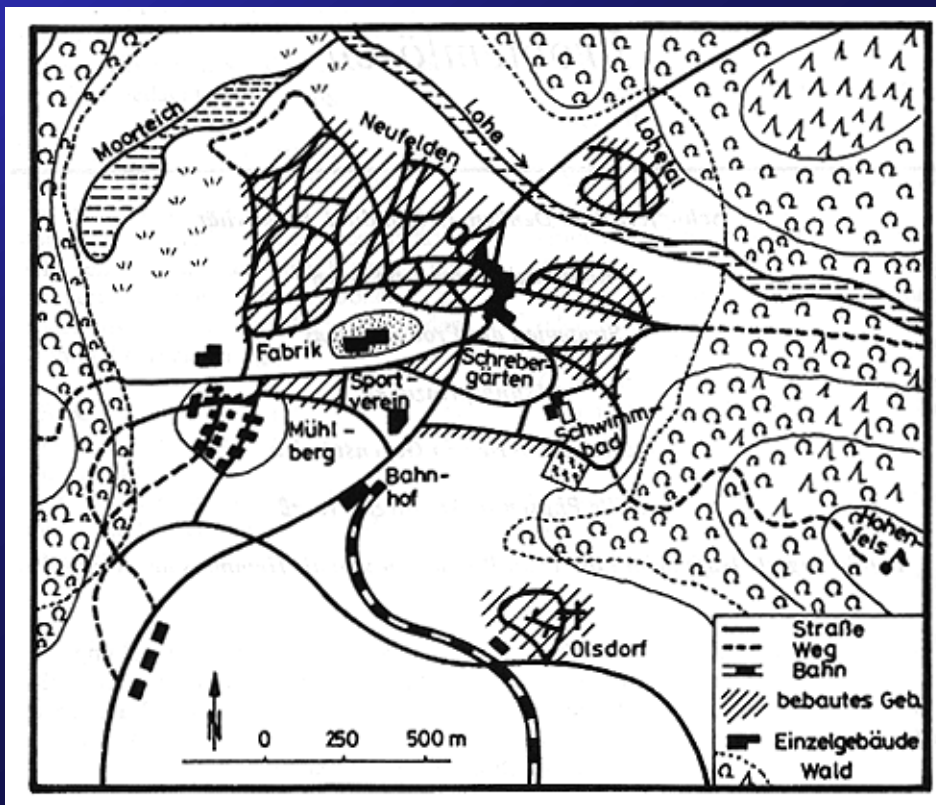


Simulatie:

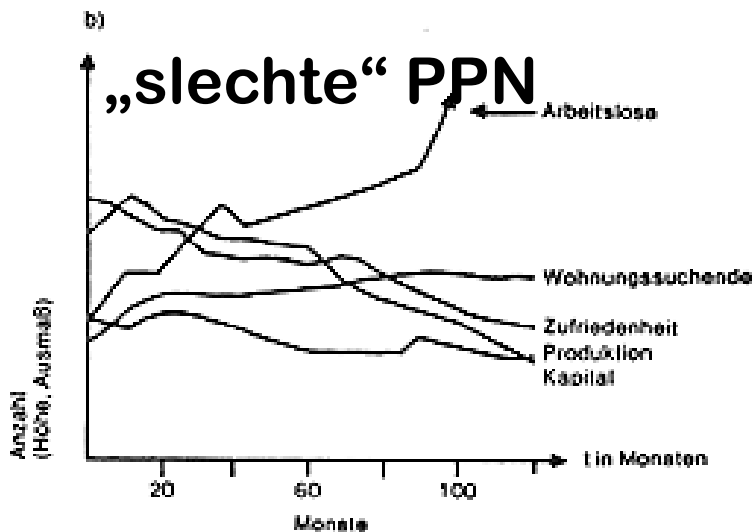
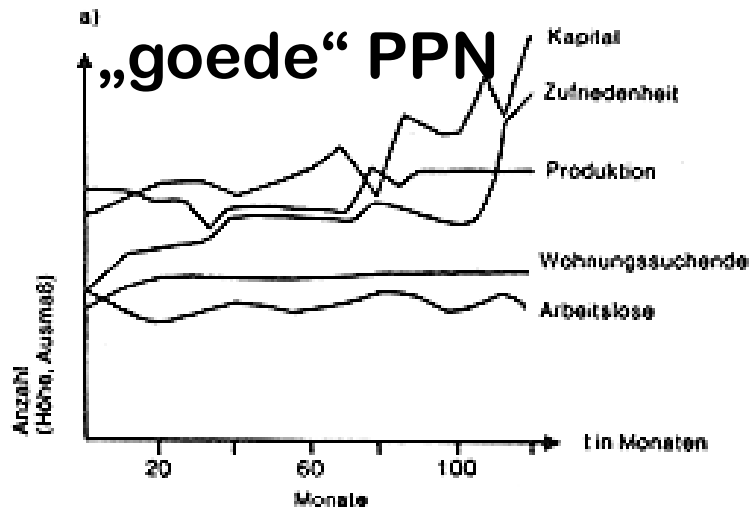
~ 2000 variabelen

PPN=burgermeester
over 10 jaren

Map van Lohhausen@Lohe



Lohhausen: Voorspellers prestatie



Inadequate voorspellers:

- IQ
- motivatie
- creativiteit
- geslacht
- leeftijd
- opleiding

Adequate voorspellers:

- zelfvertrouwen
- extraversie
- divergente exploratie
- mentale flexibiliteit, wissel van strategieën

- Simpele, duidelijk gestructureerde problemen hebben baat van logisch redeneren
- Complexe problemen met slecht gedefinieerde oplossing helemaal niet!
- Buikgevoel volgen?

Gigerenzer: Fast and frugal reasoning



Gerd Gigerenzer

Gigerenzer: Four mistaken beliefs

- People use heuristics because of their cognitive limits
- Real-world problems can always be solved by optimization
- Heuristics are always second-best solutions
- More information is always better

Gigerenzer: Fast and frugal reasoning

Which US city has more inhabitants,
San Diego or San Antonio?

Americans:

62%
correct

Germans:

100%
correct

Cues, Ecological Validities, and Discrimination Rates

Cue	Ecological validity	Discrimination rate
National capital (Is the city the national capital?)	1.00	.02
Exposition site (Was the city once an exposition site?)	.91	.25
Soccer team (Does the city have a team in the major league?)	.87	.30
Intercity train (Is the city on the Intercity line?)	.78	.38
State capital (Is the city a state capital?)	.77	.30
License plate (Is the abbreviation only one letter long?)	.75	.34
University (Is the city home to a university?)	.71	.51
Industrial belt (Is the city in the industrial belt?)	.56	.30
East Germany (Was the city formerly in East Germany?)	.51	.27

Phineas Gage

Phineas Gage



Boston Post, 14.9.1848

Mr Joseph Larkin Austin, eldest son of Mr Eleazer Austin, was found drowned near the south bridge in Salem; it is supposed he fell overboard between 2 and 3 o'clock in the morning, while fishing.

Horrible Accident.—As Phineas P. Gage, a foreman on the railroad in Cavendish, was yesterday engaged in tamming for a blast, the powder exploded, carrying an iron instrument through his head an inch and a fourth in circumference, and three feet and eight inches in length, which he was using at the time. —The iron entered on the side of his face, shattering the upper jaw, and passing back of the left eye, and out at the top of the head.

The most singular circumstance connected with this melancholy affair is, that he was alive at two o'clock this afternoon, and in full possession of his reason, and free from pain —*Ludlow, Vt., Union.*

The chief of the Philadelphia dogkillers, a black man named George Horsey, attempted to kill his wife. He broke into her room armed with a pistol and knife; she threw herself out of the second story window to escape, breaking her leg in the fall; he pursued her, and attacked and injured her severely. She was taken to the hospital. Horsey was fully committed for trial.

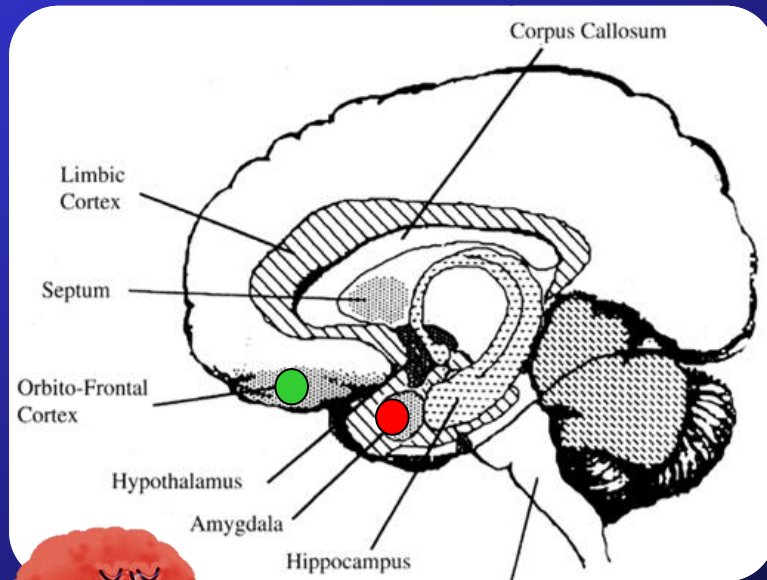


1849: back to work, loses job because of personality changes; impatient, obstinate, yet capricious and vacillating, unable to settle on any of the plans he devised for future action ("no longer Gage")

1859: lives with his mother

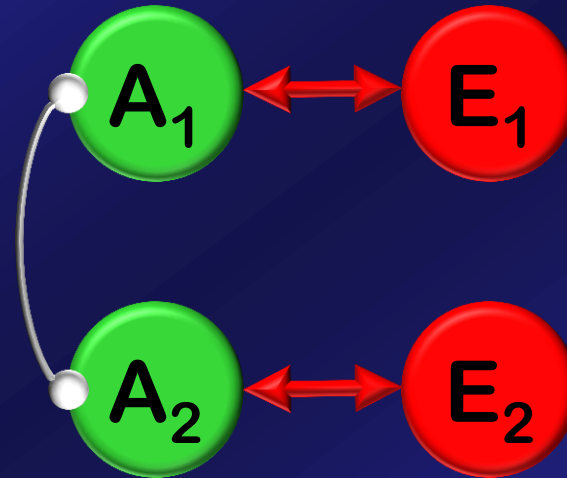
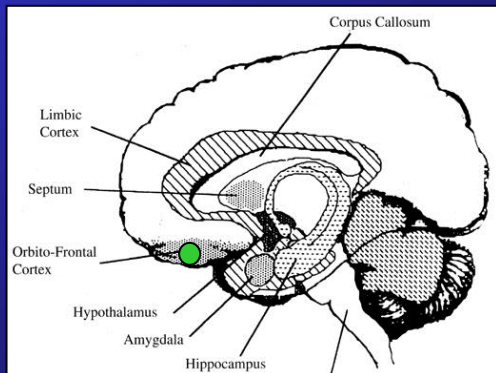
1860: epileptic seizures, dies

Orbitofrontale cortex: Verstand en gevoel



- Clinical characteristics of the *Orbitofrontal Syndrome*
 - Disinhibited, impulsive behavior (pseudopsychopathic)
 - Inappropriate jocular affect, euphoria
 - Emotional lability
 - Poor judgment and insight
 - Distractibility
- Characteristics of the *Acquired Sociopathy Syndrome*
 - General dampening of emotional experience
 - Poorly modulated emotional reactions
 - Disturbances in decision making
 - Disturbances in goal-directed behavior
 - Disturbances in social behavior
 - Marked lack of insight into acquired changes

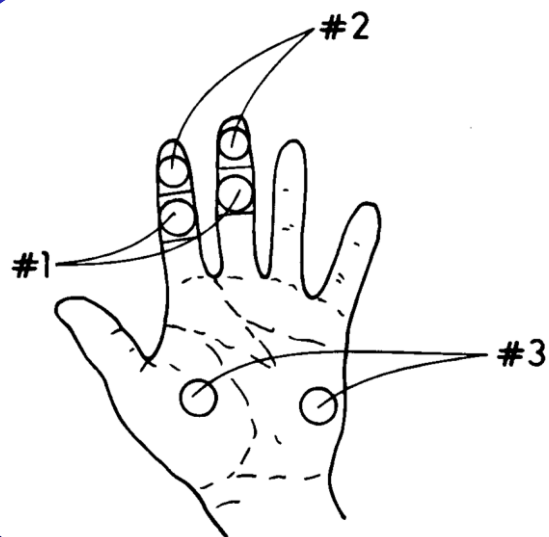
Damasio's somatic marker theory



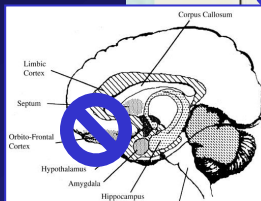
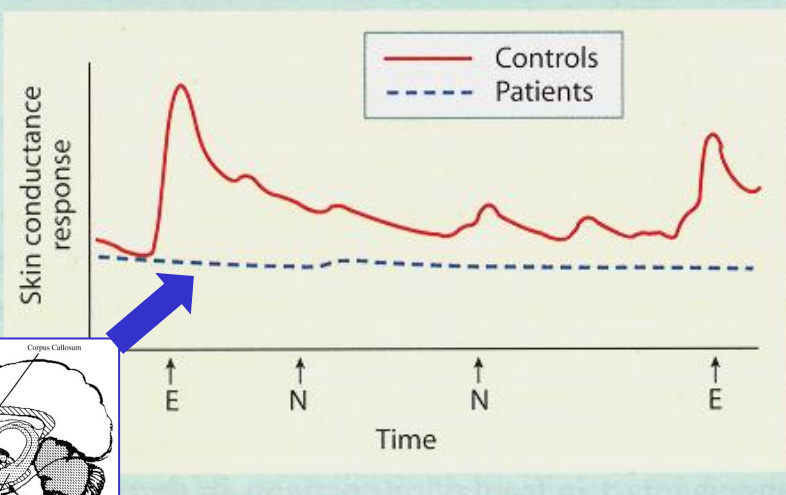
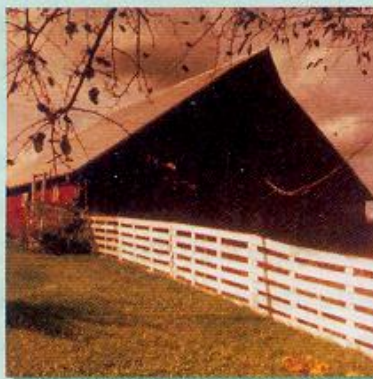
Gevolgen van
acties



Het nut van zweet



Damasio (1994):
Ventromedial-frontale
patienten tonen geen
affectieve respons op
emotionele stimuli



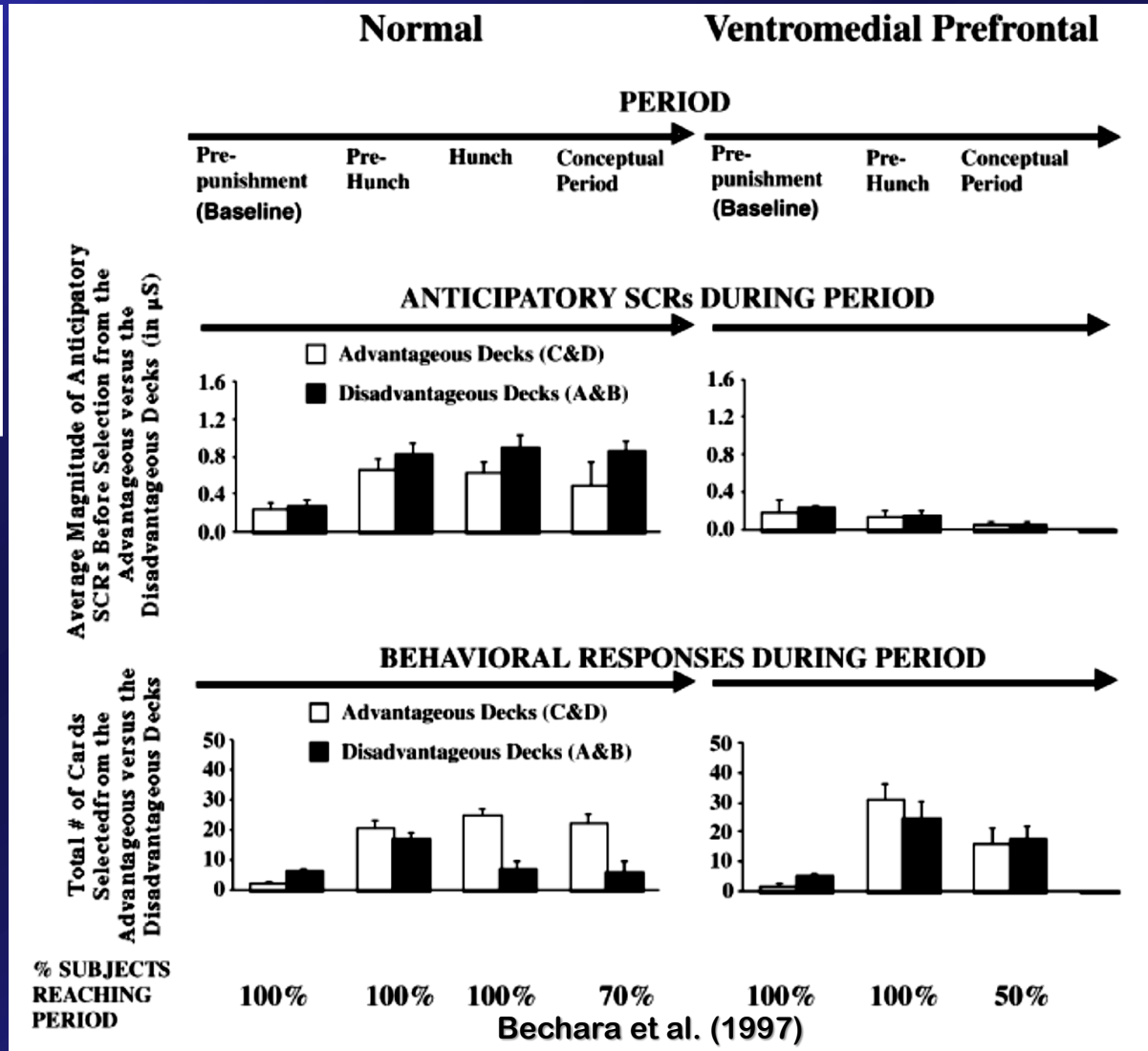
Anticipatie en risico's

The Iowa Gambling Task

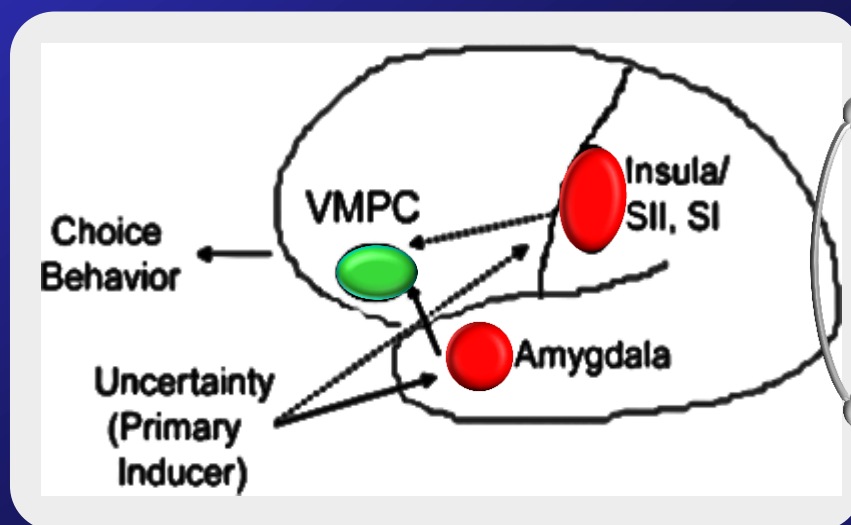
	"Bad" decks		"Good" decks	
	A	B	C	D
Gain per card	\$100	\$100	\$50	\$50
Loss per 10 cards	\$1250	\$1250	\$250	\$250
Net per 10 cards	-\$250	-\$250	+\$250	+\$250

- Gezonde leren uit ervaring
- Frontale patiënten niet
- Gezonde anticiperen risico's
- Frontale patiënten niet

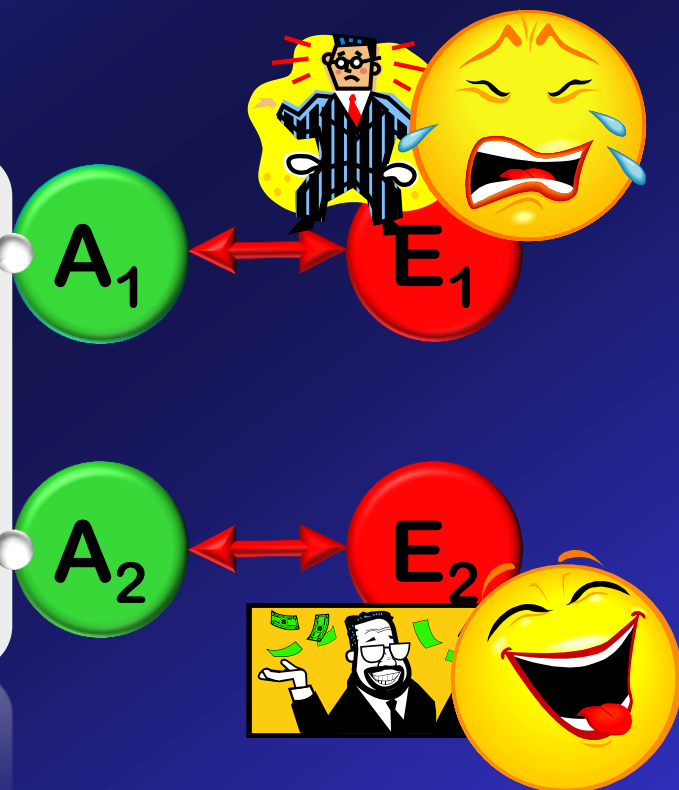
Bechara et al. (1997)



Hoe werken somatic markers?

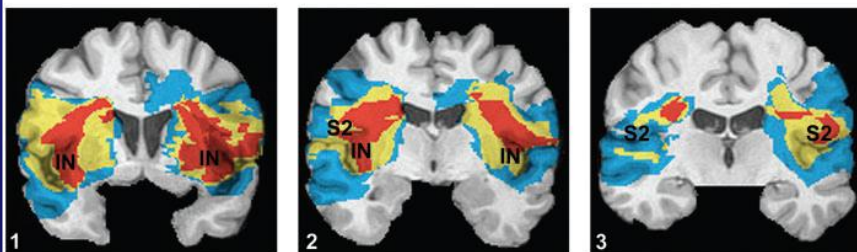
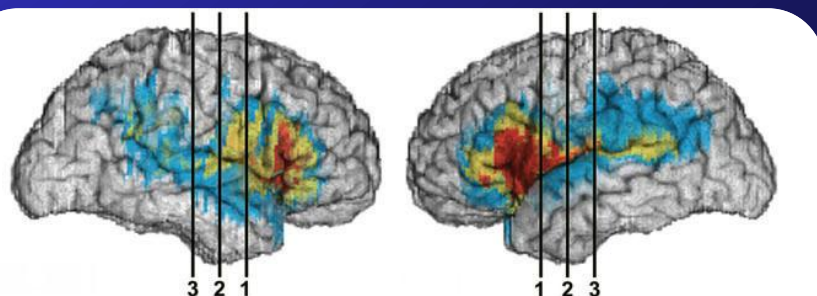


Weller et al. (2007)



Slecht beslissen zonder insula

Clark et al. (2008)

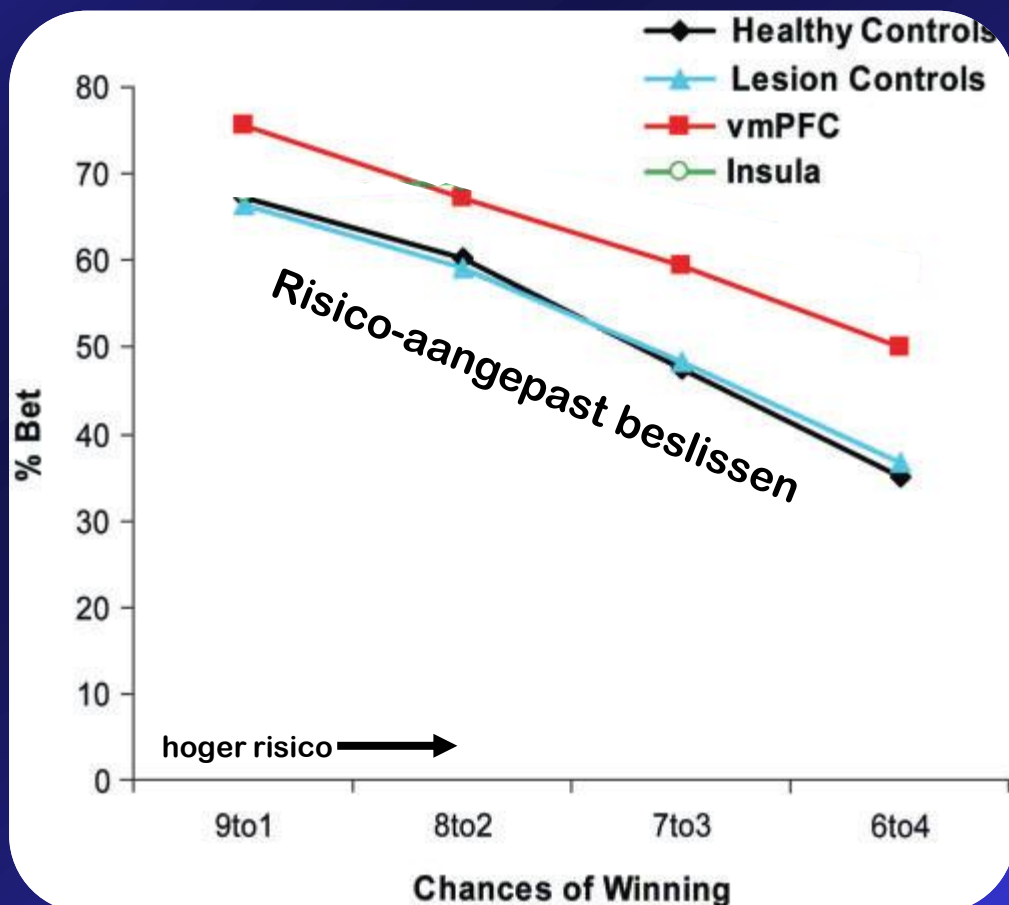


1 2 3 4 5 >

of overlaps

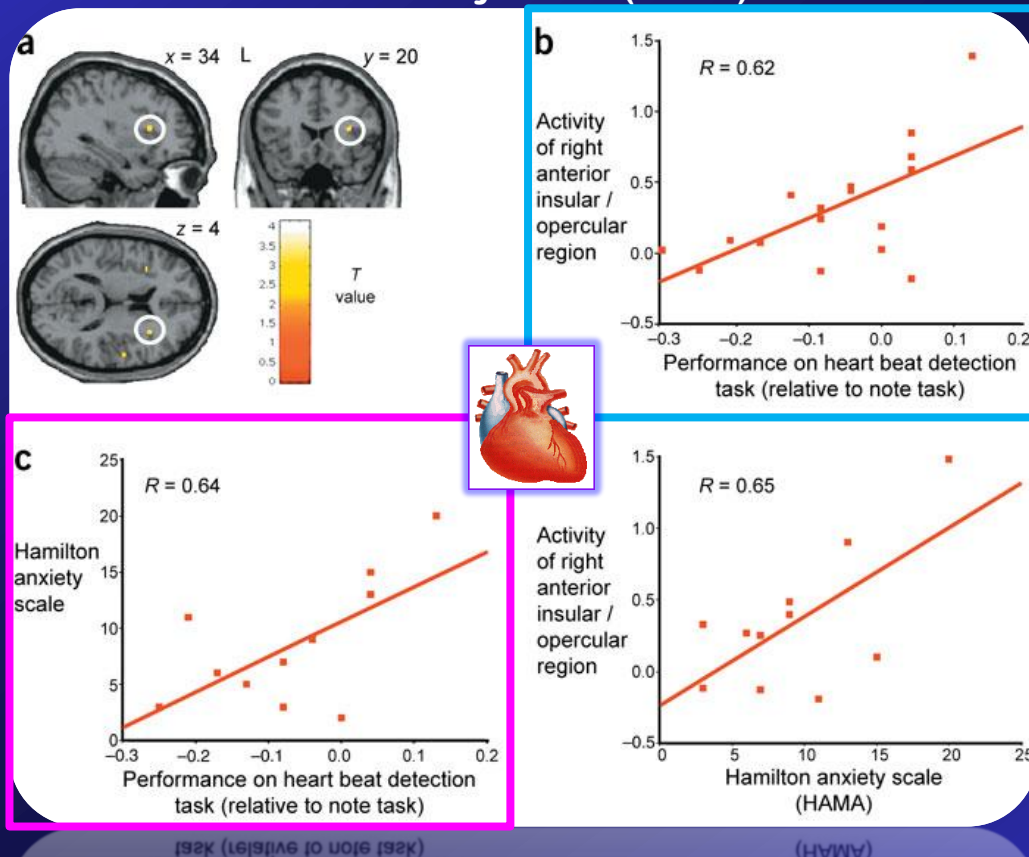
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Hartslag perceptie

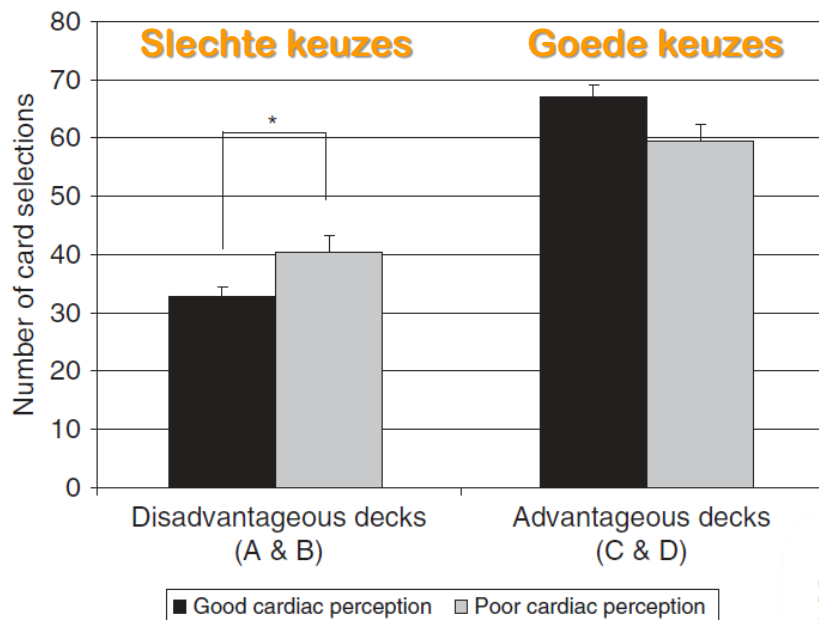
Critchley et al. (2004)



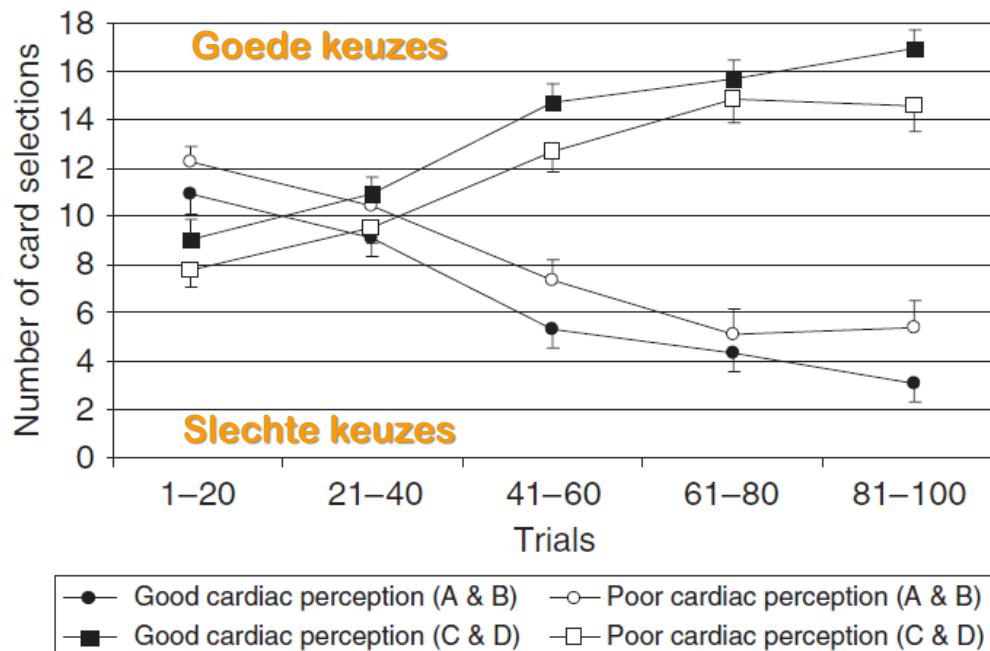
Goede hartslag detectors

- zijn meer emotioneel
- hebben actievere insular cortex

Zijn gevoelige mensen de betere beslissers?



Werner et al. (2009)



Hoe we de modus operandus van onze brein door onze stemming controleren

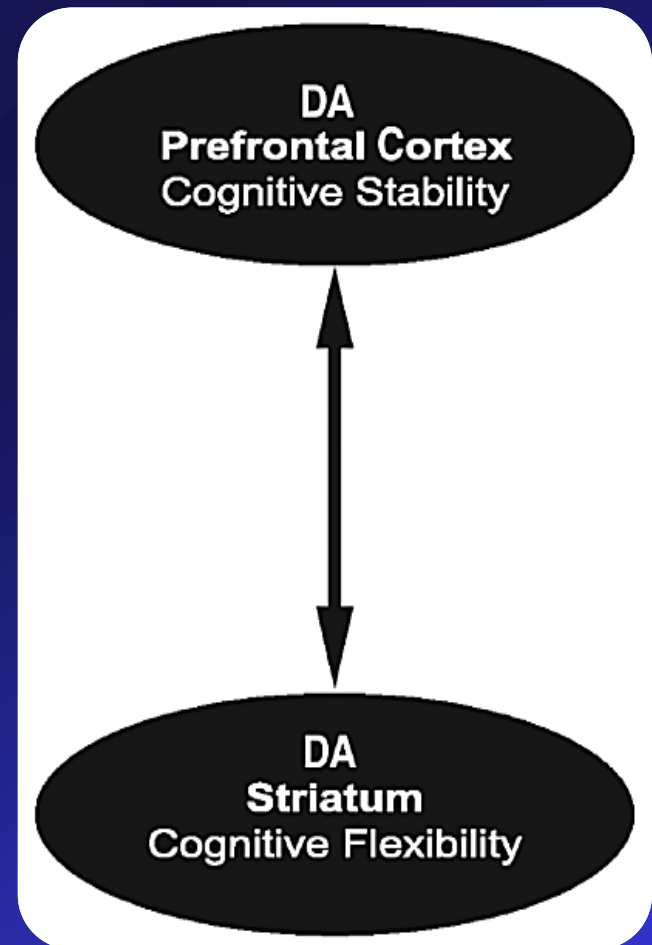
Yin en Yang van de cognitieve controle

Super-Mario perspectief op cognitieve controle



- Sterke focus op taak
 - Doelgerichtheid
 - Voorkomen van afleiding
- Problematisch (Goschke, 2000):
- Geen flexibiliteit
 - Ignoreren van potentieel belangrijke info

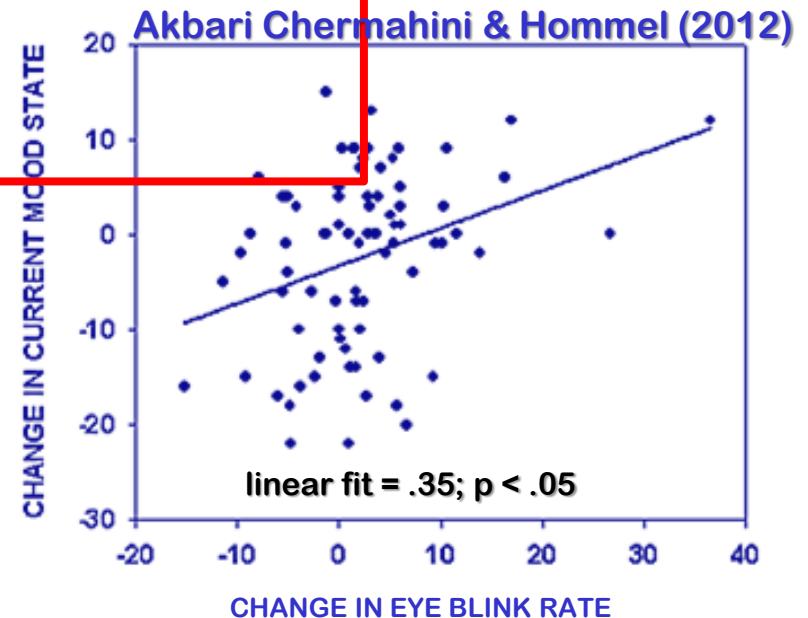
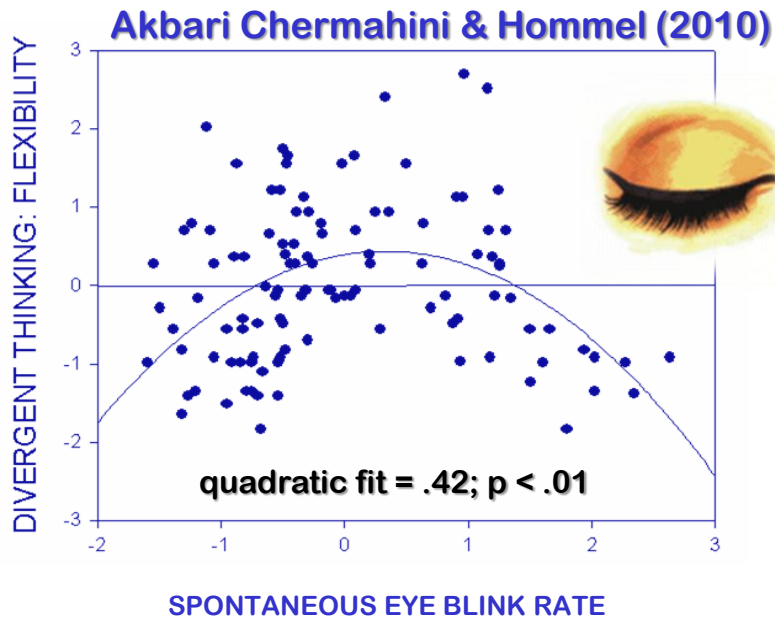
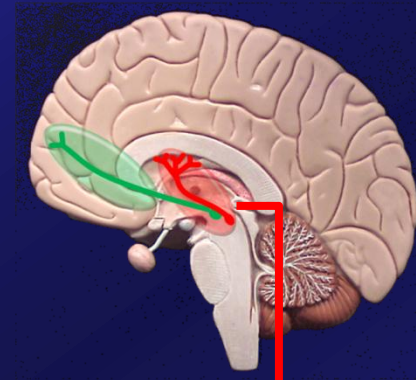
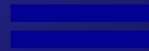
Cools & d'Esposito (2010)



Mesofrontale vs. nigrostriatale dopaminerge route

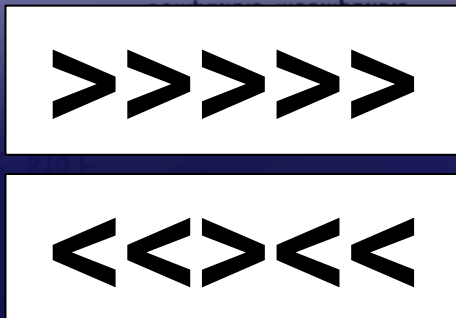
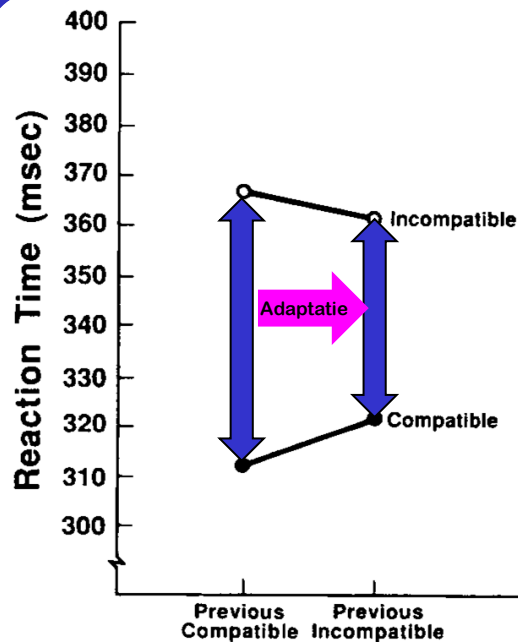


Soghra Akbari

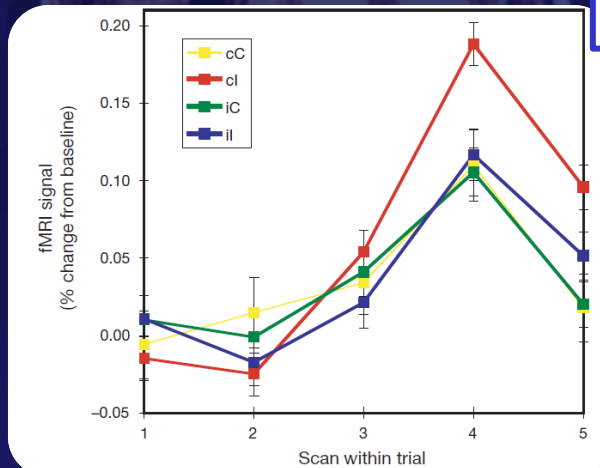
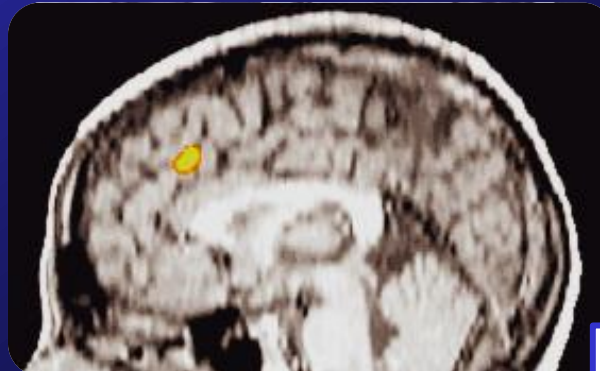


Gratton effect & conflict monitoring

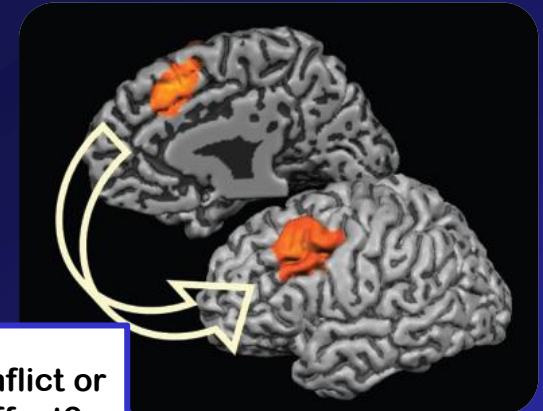
Gratton, Coles & Donchin (1992)



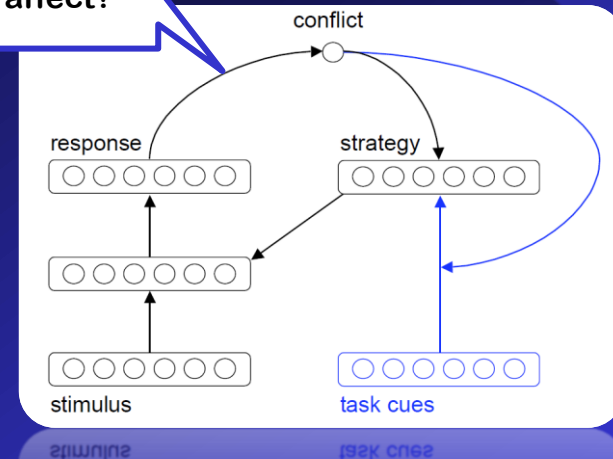
Botvinick et al. (1999)



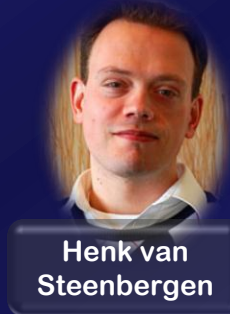
Van Veen & Carter (2006)



conflict or affect?

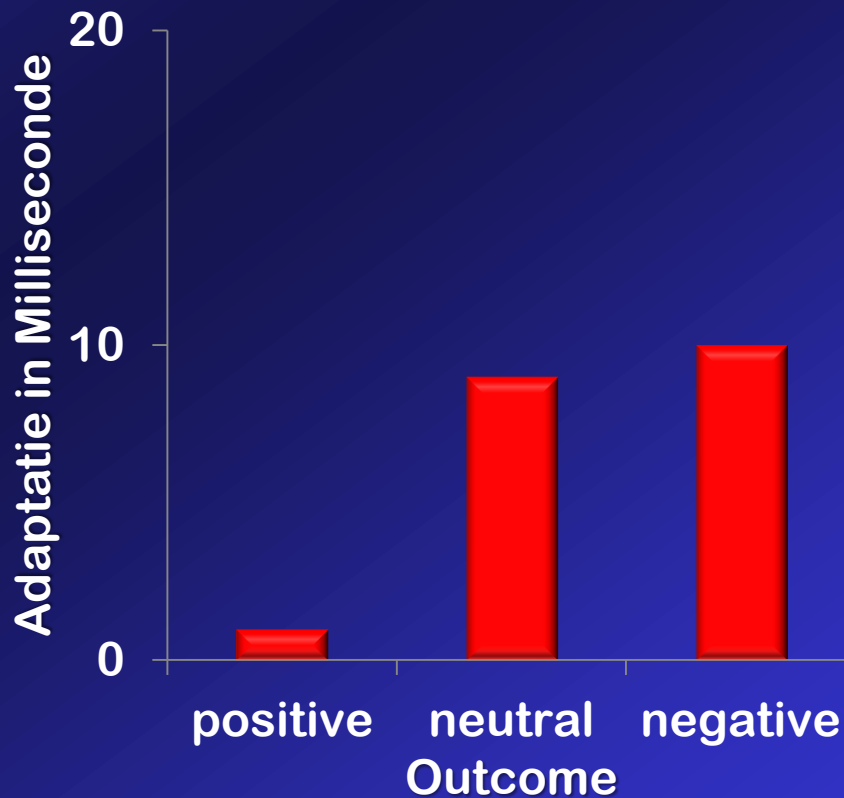
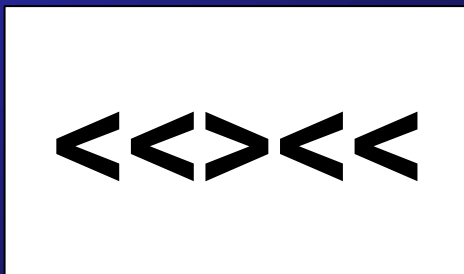
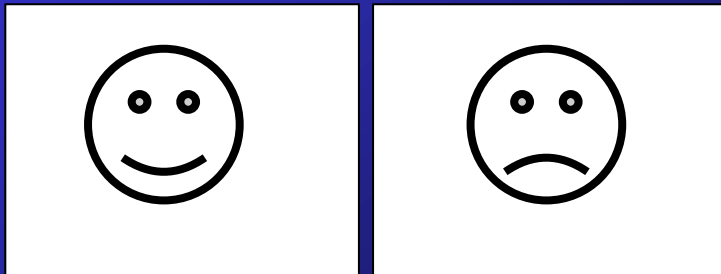


Cognitieve adaptatie en emotie



+ .20€

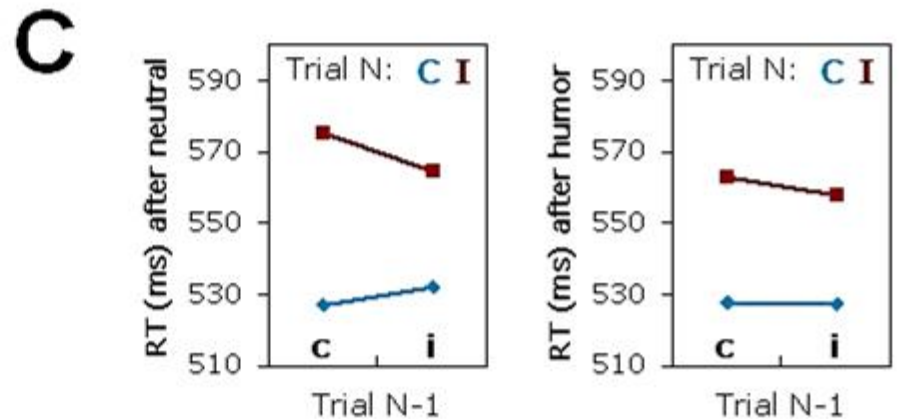
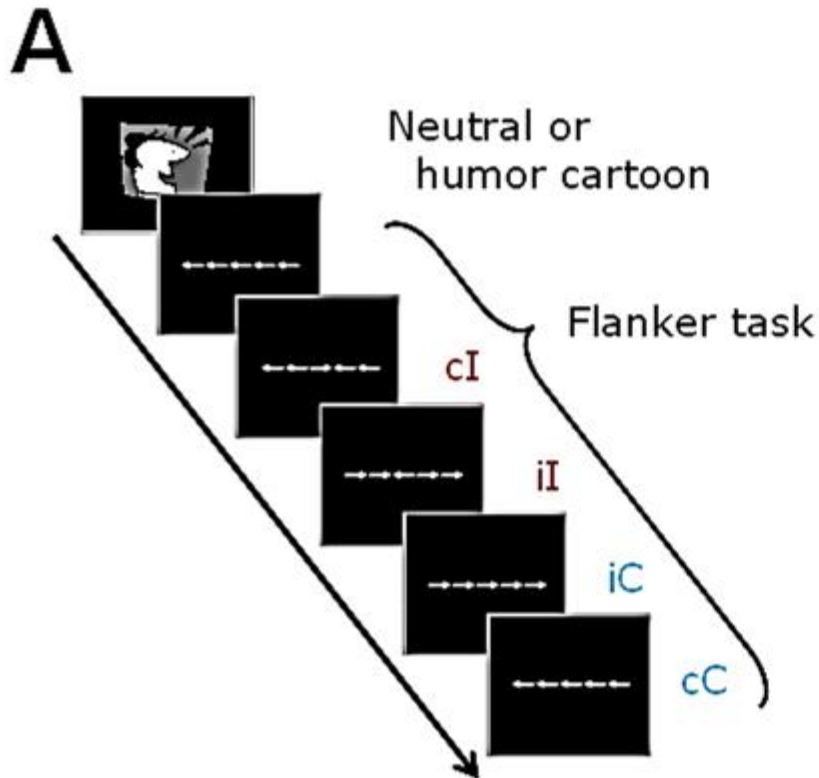
- .20€



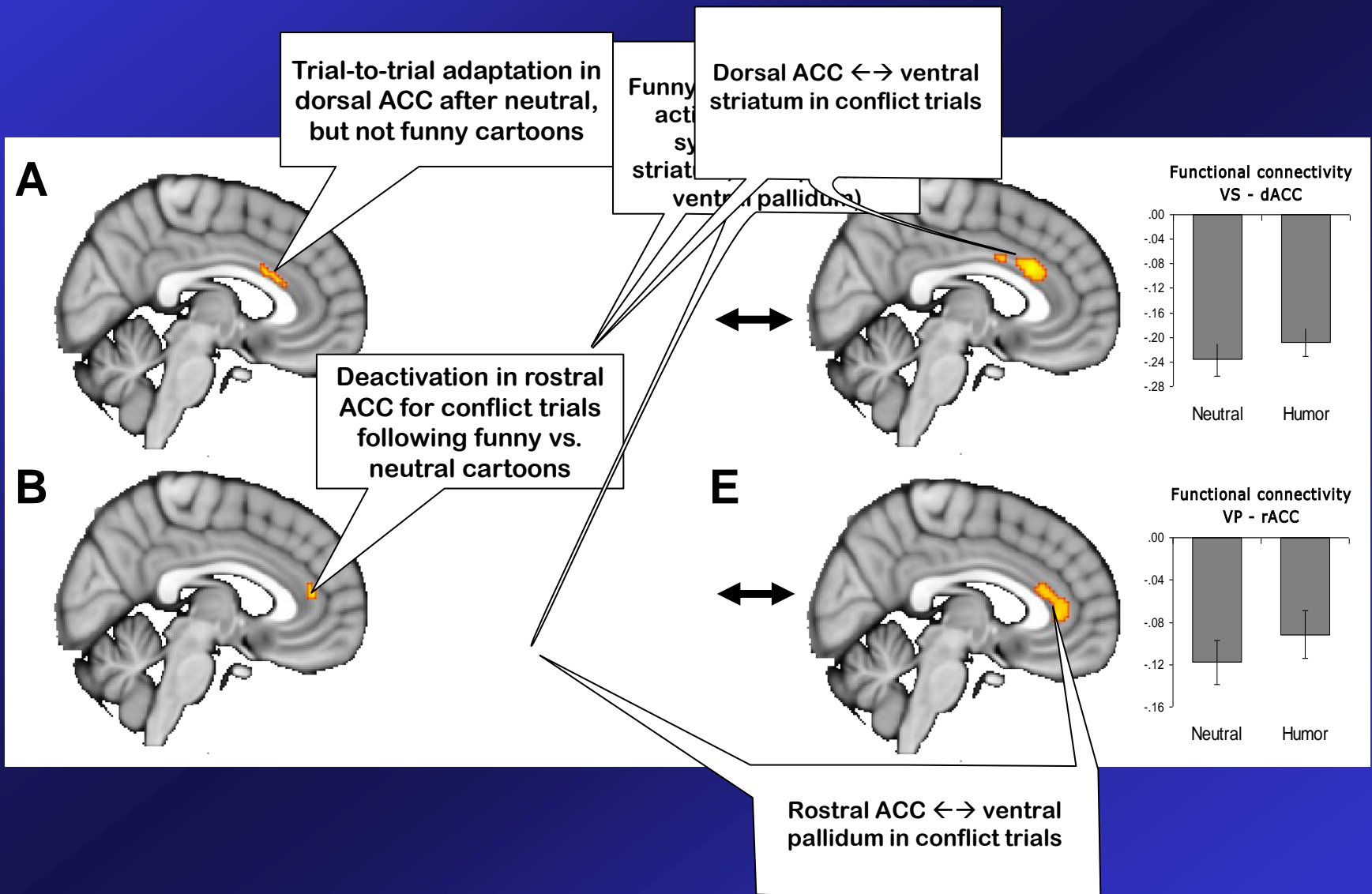
Cognitieve adaptatie en emotie



Henk van Steenbergen



Cognitieve adaptatie en emotie



De notendop



Pascal: “Het hart heeft zijn redenen, die de rede niet kent”

- Goede beslissingen vereisen niet het *uitsluiten* van emoties maar de *integratie* van verstand en gevoel
- “Doe maar gewoon, dan doe je al gek genoeg”;
“overdaad schaadt, middelmaat baat”?
- → een pleidooi voor passie en gekte!