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

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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**

<table>
<thead>
<tr>
<th>Cognition</th>
<th>Thought, reason, will. Considered rational judgment - the &quot;good&quot;.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion/Affect/Passion</td>
<td>&quot;Thumos&quot;, anger or spirited higher ideal emotions, resenting infringements by others and lower appetites.</td>
</tr>
<tr>
<td>Conation/Motivation</td>
<td>Impulses, cravings, instincts, appetites. Multitude of clamant and conflicting appetites for particular gratifications.</td>
</tr>
</tbody>
</table>

**Components of the State**

<table>
<thead>
<tr>
<th>Ruling Class</th>
<th>Philosophers, kings, statesmen, nobility. Interested in wisdom.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warrior Class</td>
<td>Soldiers, policemen, auxiliaries, men of action. Interested in practical distinction.</td>
</tr>
<tr>
<td>Lower Classes</td>
<td>Civilians, workers, peasants, slaves. Interested in enjoyment and gratification.</td>
</tr>
</tbody>
</table>

*(from Plato, The Republic; after Scherer, 1995)*
<table>
<thead>
<tr>
<th>Cognitie</th>
<th>Emotie</th>
</tr>
</thead>
<tbody>
<tr>
<td>langzaam</td>
<td>snel</td>
</tr>
<tr>
<td>omvattend</td>
<td>selectief</td>
</tr>
<tr>
<td>objectief</td>
<td>subjectief</td>
</tr>
<tr>
<td>logisch</td>
<td>onlogisch</td>
</tr>
<tr>
<td>rationeel</td>
<td>irrationeel</td>
</tr>
<tr>
<td>koudbloedig</td>
<td>overstuur</td>
</tr>
</tbody>
</table>
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
Le Doux's 2-routen theorie

- Cognitieve route: waarnemen → evalueren → handelen
- Sensomotorische route: shortcut via thalamus & amygdala → handelen
Amygdala: Impliciet vs. expliciet emotioneel leren

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

Skin conductance response
Conditioned stimulus Unconditioned stimulus
Normal control subject Patient with amygdala damage

Time

Neocortex
Stimulus channels:
1 Features
2 Objects
3 Concepts
4 Contexts

Sensory thalamus
Primary sensory
Unmodal association
Polymodal association
Emotional cortex
Hippocampus
Subiculum

Basolateral nucleus
Central nucleus of the amygdala
Basomedial nucleus

Emotional responses
Behavioral
Autonomic
Endocrine
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
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: 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
Which US city has more inhabitants, San Diego or San Antonio?

Americans: 62% correct

Germans: 100% correct
Phineas Gage

Boston Post, 14.9.1848

Mr Joseph Larkin Austin, eldest son of Mr Kieler Austin, was found drowned near the south bridge in Salom; 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 tunneling 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
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 theorie

Gevolgen van acties
Het nut van zweet

Anticipatie en risico's

Bechara et al. (1997)

- 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)

Risico-aangepast beslissen

hoger risico
Goede hartslag detectors

- zijn meer emotioneel
- hebben actievere insular cortex

Critchley et al. (2004)
Zijn gevoelige mensen de betere beslissers?

Werner et al. (2009)

Goede keuzes

Slechte keuzes

Number of card selections

Disadvantageous decks (A & B)

Advantageous decks (C & D)

Good cardiac perception

Poor cardiac perception

Trials

Number of card selections

1-20

21-40

41-60

61-80

81-100
Hoe we de modus operandus van onze brein door onze stemming controleren
Sterke focus op taak
Doelgerichtheid
Voorkomen van afleiding

→ Problematisch (Goschke, 2000):
  • Geen flexibiliteit
  • Ignoreren van potentieel belangrijke info
Mesofrontale vs. nigrostriatale dopaminerge route

Akbari Chermahini & Hommel (2010)

DIVERGENT THINKING: FLEXIBILITY

quadratic fit = .42; p < .01

Akbari Chermahini & Hommel (2012)

CHANGE IN EYE BLINK RATE

linear fit = .35; p < .05
Gratton effect & conflict monitoring

Gratton, Coles & Donchin (1992)

Botvinick et al. (1999)


conflict or affect?

Relevance of Task Cues in Task Execution: A Conflict Monitor Perspective

- GRATTON EFFECT: Time to reaction increases when the task and stimulus are incompatible.
- CONFLICT OR AFFECT?: Conflict monitoring can be distinguished from affect monitoring.

MRI signal changes over time:
- cC: Conflict Cue
- CI: Conflict Indicator
- IC: Item Cue
- II: Item Indicator

Conflict response strategy:
- Task cues influence the selection of response strategy.
Cognitieve adaptatie en emotie

Adaptatie in Millicronde

Outcome

Henk van Steenbergen
Cognitieve adaptatie en emotie

Henk van Steenbergen
Cognitieve adaptatie en emotie

Trial-to-trial adaptation in dorsal ACC after neutral, but not funny cartoons

Deactivation in rostral ACC for conflict trials following funny vs. neutral cartoons

Dorsal ACC $\leftrightarrow$ ventral striatum in conflict trials

Functional connectivity VS - dACC

Neutral Humor

Functional connectivity VP - rACC

Neutral Humor

Rostral ACC $\leftrightarrow$ ventral pallidum in conflict trials
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!

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