ESISTE UN MODO «NEUROTIPICO» DI ESSERE FELICI?

Massimo Molteni

REPORTS | QUANTUM PHYSICS

A Schrödinger cat living in two boxes

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Quantum cats here and there

The story of Schrödinger's cat being hidden away in a box and being both dead and alive is often invoked to illustrate the how peculiar the quantum world can be. On a twist of the dead/alive behavior, now the cat can be in two separate locations at the same time

Le leggi nell'infinitamente piccolo sono differenti da quelle che percepiamo nella vita reale

«Lo spostamento di un singolo elettrone per un miliardesimo di centimetro, a un momento dato, potrebbe significare la differenza tra due avvenimenti molto diversi, come l'uccisione di un uomo un anno dopo, a causa di una valanga, o la sua salvezza.»

(Alan Turing, Macchine calcolatrici e intelligenza, 1950)

Piccole variazioni nelle condizioni iniziali producono grandi variazioni nel comportamento a lungo termine di un sistema.

Sistemi complessi e teoria del Caos

The pursuit of happiness:
The social and scientific origins of Hans Selye's natural philosophy of life

Mark Jackson

History of the Human Sciences
25(5) 13–29

Recent attempts to calculate and engineer happiness have often been based on an intuitive, almost transcendental, notion of happiness as a universal and timeless quality, recognizable in all cultures at all historical moments.

At the turn of the millennium, it became fashionable for scientific experts, health psychologists, the media and government ministers (at least in Europe) to proclaim not only that happiness could be accurately defined and quantified, but also that it could be more readily attained if modern populations implemented a relatively **simple set of prescriptions** for individual behaviour and social reform

Hans Selye

Just as a person's health depends on the harmonious conduct of the organs within his body,
so must the relations between individual people, and by extension between the members of families, tribes, and nations, be harmonized by the emotions and impulses of altruistic egotism that **automatically** ensure peaceful cooperation and remove all motives for revolutions and wars.

Can the scientific study of stress help us to formulate a precise program of conduct?

Can it teach us the wisdom to live a rich and meaningful life which satisfies our needs for self-expression and yet is not marred or cut short by the stresses of senseless struggles? (Selye, 1956)

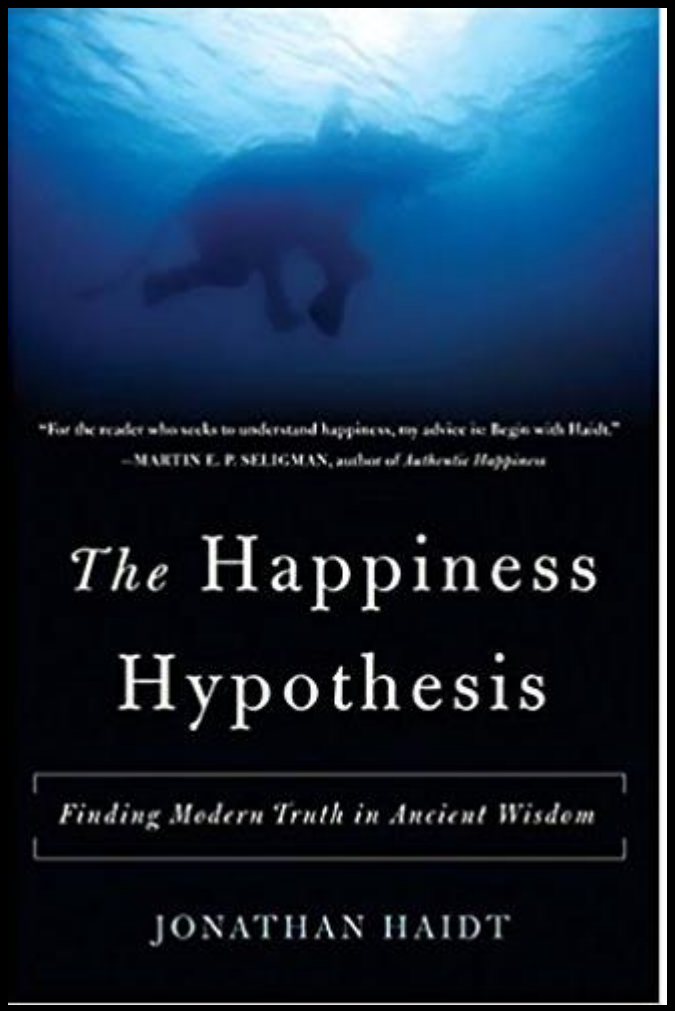
Biological rules governing cells and organs 'could also be the source of a natural philosophy of life, leading to a code of behavior based on scientific principles'
(Selye, 1974)

Psicologia Positiva

Martin Seligman

H = S + C + V

Happiness **equals**
our happiness set point,
plus
our living conditions,
plus
our voluntary activities.



HAPPINESS SET POINT

There are three ways we can change our automatic thought patterns in order to increase our happiness set point:

- Meditation
- Cognitive Therapy
- Prozac

La medicina al servizio della felicità

CONDITIONS OF LIVING

- long commute,
- conflict in your relationships,
- lack of control in your life,
- making more money: being poor is stressful and reduces happiness.

VOLUNTARY ACTIVITY

- Pleasure comes more from making progress towards a goal, then from actually accomplishing your goal.
- Find healthy activities to do
  - building strong relationships in the community
  - diet and exercise.

Inclusione: premessa alla felicità

"I greci chiamavano la felicità **eudaimonía**, il 'buon demone', e –meglio ancora- **eutychía**, 'la buona sorte'.
E la lingua tedesca intende la felicità allo stesso modo: la parola **Glück** significa insieme **'felicità' e 'fortuna**', che è come dire '***felici per caso***'.
Anche la parola inglese happiness, 'felicità', deriva dal verbo to happen, che vuol dire appunto 'accadere' e allude perciò all'occasionalità e all'aleatorietà dell'essere felici.»

Salvatore Natoli – La Felicità di questa vita

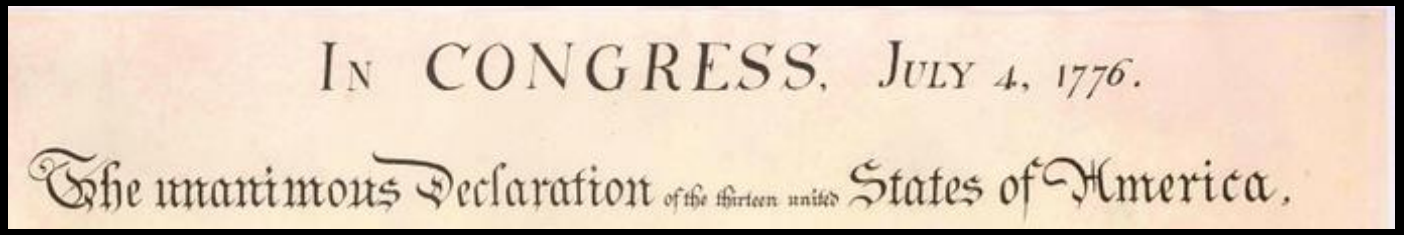
La felicità ….dimensione della vita terrena e non solo demandata all'esistenza che ci attende dopo la morte…
Dono di Dio per tutti …grazie alla Fede
San Tommaso e il pensiero cristiano

Realizzare la Felicità attraverso la Ragione –
il rinascimento

Godere del mondo attraverso le proprie azioni: la massima felicità per il massimo numero di persone
Illuminismo

"A metà strada tra Platone e il Prozac,
la felicità ha smesso di essere un nobile obiettivo
per diventare un diritto"

(Richard Schoch – Le vie della felicità)

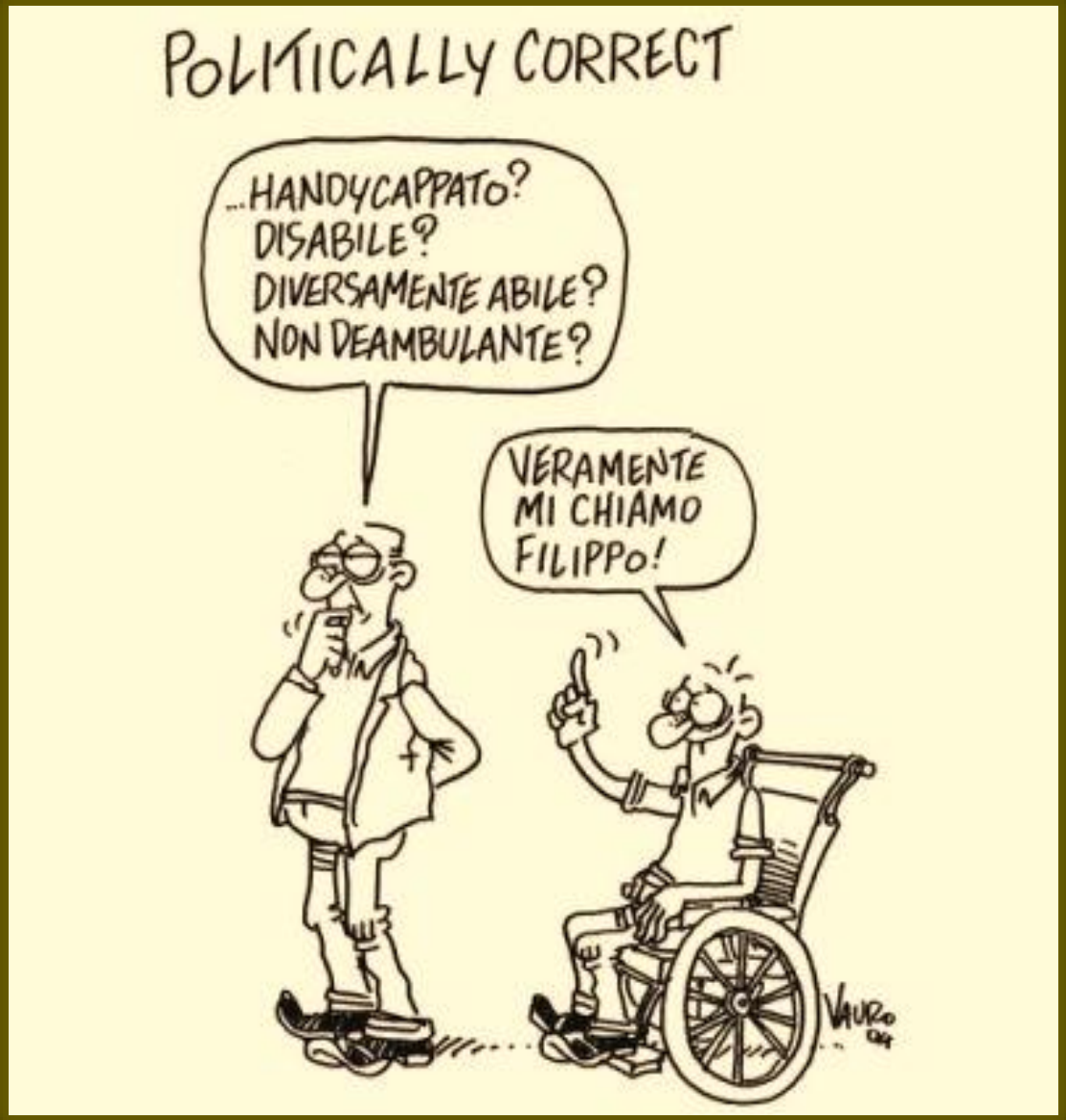

IN CONGRESS, JULY 4, 1776.

The unanimous Declaration of the thirteen united States of America,

Noi riteniamo che sono per se stesse evidenti queste verità: che tutti gli uomini sono creati eguali; che essi sono dal Creatore dotati di certi **inalienabili diritti**, che tra questi diritti sono la Vita, la Libertà, e **il perseguimento della Felicità**; ……..
che ogni qualvolta una qualsiasi forma di governo tende a negare questi fini, il popolo ha diritto di mutarla o abolirla e di istituire un nuovo governo fondato su tali principi e di organizzarne i poteri nella forma che sembri al popolo meglio atta a **procurare la sua Sicurezza e la sua Felicità.**

"Sto cercando di immaginare sotto quale nuova forma il dispotismo potrebbe riapparire nel mondo.
In primo luogo vedo una moltitudine di uomini, simili e uguali, che girano continuamente alla ricerca dei piccoli e banali piaceri con cui nutrono la propria anima.
Ciascuno di loro chiuso in se stesso è quasi indifferente al destino degli altri.
Al di sopra di uomini simili c'è un potere immenso, protettivo, unico responsabile della loro gioia e del loro destino.
Questo potere è assoluto, attento ai dettagli, ordinato, previdente e gentile. (...)
Gli fa piacere vedere che i cittadini si divertono, purché non pensino ad altro che a divertirsi.
Lavora volentieri per la loro felicità, ma vuole essere l'unico agente e giudice di essa."

A. de TOCQUEVILLE (a cura di J.P. Mayer), Democracy in America, 2 Vol


POLITICALLY CORRECT
...HANDYCAPPATO?
DISABILE?
DIVERSAMENTE ABILE?
NON DEAMBULANTE?
VERAMENTE MI CHIAMO FILIPPO!
VAURO

"Since Aristotle, happiness has been thought of as consisting of the dual aspect of hedonia (pleasure) and eudaimonia (a life well-lived, embedded in meaningful values)."

Kringelbach and Berridge

FELICITA'

- EDONIA (PIACERE)
  - EMOZIONI
  - PULSIONI
  - FEELINGS

  Stimolo/evento- modifica omeostasi – azione implicita di risposta

- EUDAIMONIA (VITA BEN VISSUTA – LA "BUONA VITA" INTRECCIATA NEI VALORI SIGNIFICATIVI)
  - Risorse personali
    - Mentali
    - Fisiche
    - Materiali
  - Contesti sociali
    - Valori condivisi
    - Trasmissione culturale
    - Comunicazione sociale

OPINION

The nature of feelings: evolutionary and neurobiological origins

Antonio Damasio and Gil B. Carvalho

NATURE REVIEWS | NEUROSCIENCE VOLUME 14 | FEBRUARY 2013 | 143

Sopravvivenza: capacità di mantenere l'omeostasi all'interno di un definito range di oscillazione compatibile

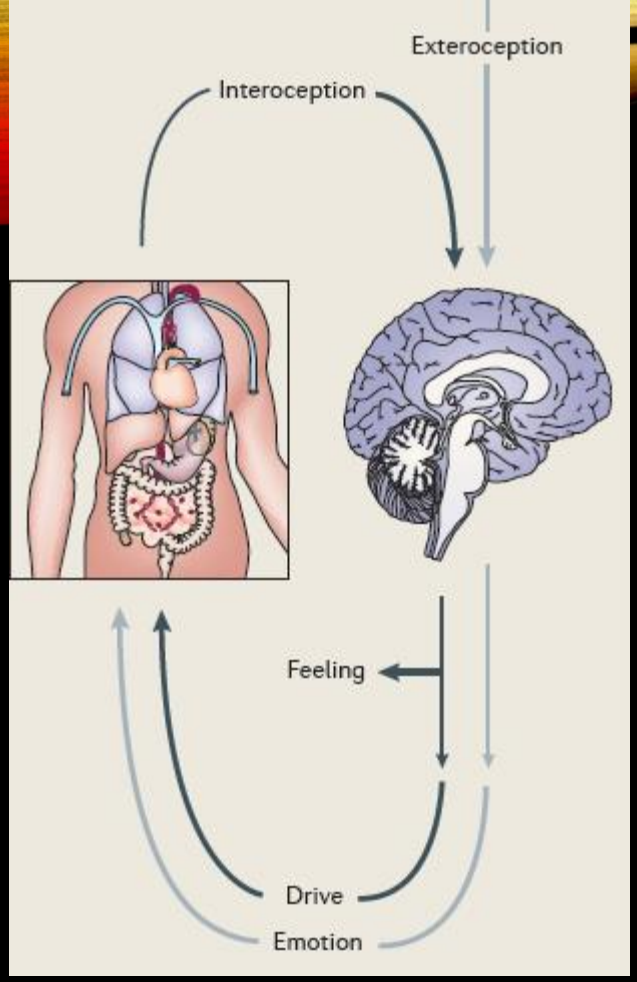
→ tempestivo riconoscimento dei cambiamenti e appropriate azioni/programmi di risposta.

Feelings: esperienze mentali di stati del corpo

«Danno significato, consentono di riconoscere e chiamare per nome »

bisogni fisiologici (es. la fame),
danni ai tessuti (il dolore),
stati ottimali di funzionamento (benessere),
minacce all'organismo (paura o rabbia),
modalità di interazione sociale (compassione, gratitudine etc).

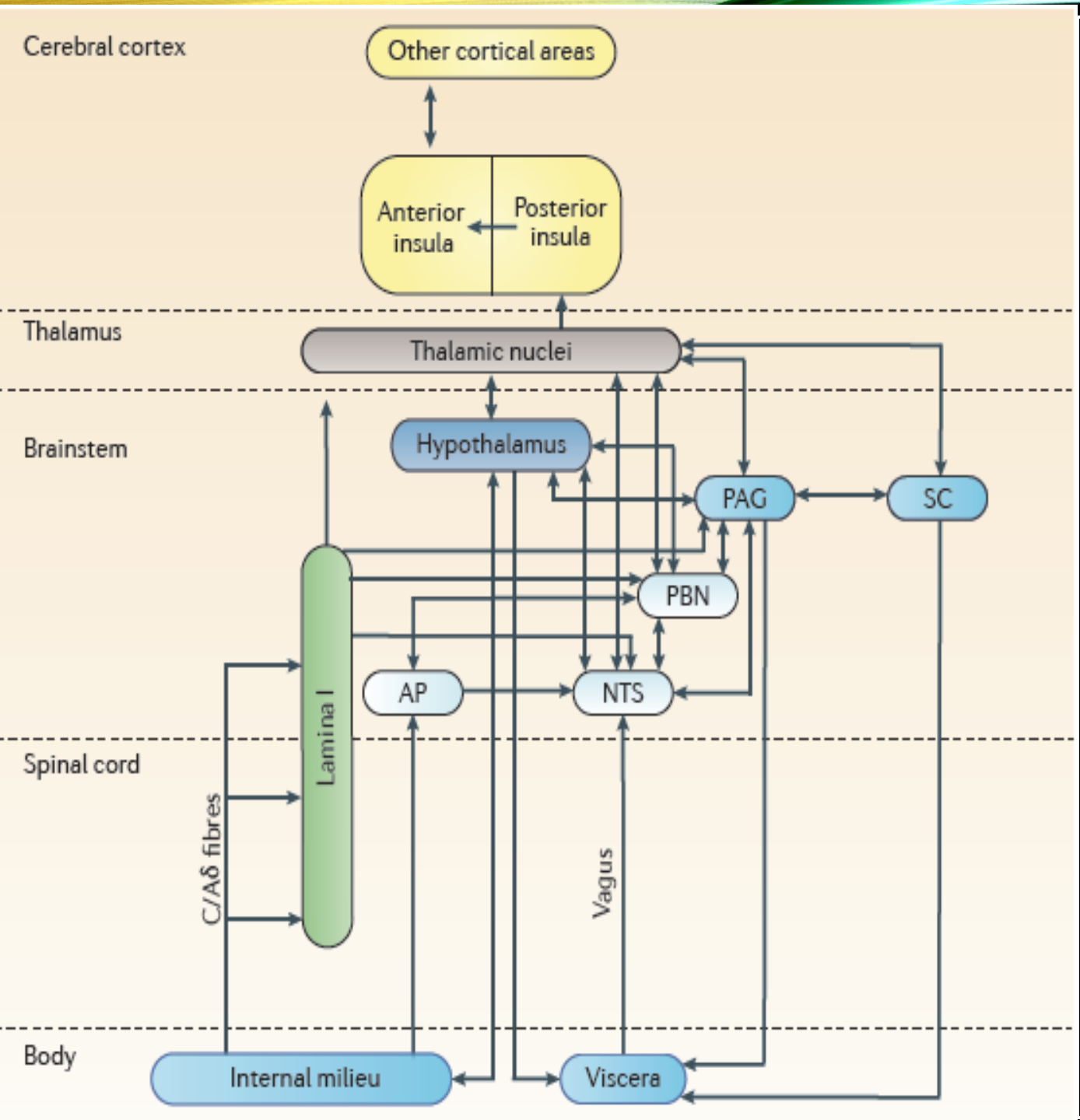
- Facilitano l'apprendimento relativo alla situazione o condizione che determina il disequilibrio o la sua correzione
- Consentono di anticipare future condizioni vantaggiose o svantaggiose → concorrono a regolare il comportamento



Feeling:

- esperienza soggettiva della regolazione della propria vita, che riguarda processi "elementari" o molto basici e complesse emozioni sociali
- accessibili solo all'organismo che li sperimenta.

Stimulus	High blood osmolarity	Significant pressure against sharp object	Sight of a bear	Receiving bad news
Action programme (drive/ emotion)	• Dry mouth • Decreased water elimination • Irritability • Tiredness	• Retraction of affected limb or body part • Local vasodilation • Facial muscles form expression of pain • Attention focused on affected body part	• Increased heart and respiratory rates • Secretion of cortisol and adrenaline • Redistribution of blood flow • Analgesia • Facial muscles form expression of fear • Attention focused on perceived threat	• Increased blood pressure • Irregular heart rhythm • Decreased respiratory rate • Lacrimal secretion • Facial muscles form expression of sadness
Feeling	Thirst	Pain	Fear	Sadness



Substrato neurale:

- Tronco encefalico (PBN – nucleo parabrachiale, NTS – nucleo tratto solitario, PAG- sostanza grigia periacqueduttale)
- Corteccia cerebrale (insula e lamina I e II).

Lesioni posterosuperiori del tronco → coma o stato vegetativo (assenza di feeling)
Lesioni anterosuperiori del tronco → locked-in syndrome, (feelings and consciousness non aboliti)

OPINION

The nature of feelings: evolutionary and neurobiological origins

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- **Action programmes do not require deliberation**.
- **They are instinctual, biologically pre-set and largely stereotypical**. For example, in the case of pressure from a sharp object, the ensuing action programmes include retraction of the affected area away from the stimulus and facial muscle contraction to form an expression of pain.
- **Their deployment can be influenced by learning (conditioning), which also allows the extension and transfer of homeostatic goals to objects and situations that become imbued with biological value**: for example, money, power or drugs or migrations

OPINION

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Homeostatic action programmes requires **four** elements.

1. **A competent stimulus**, such as an internal deviation from homeostatic range or an external object or circumstance, **be it currently perceived or recalled in mind.**
2. **Neural interfaces capable of detecting the stimulus.**
3. **Neural execution sites** capable of coordinating a collection of corrective actions — that is, the action programme (drive or emotion).
4. **Neural interfaces capable of detecting the completion of the correction and halting the corrective actions**

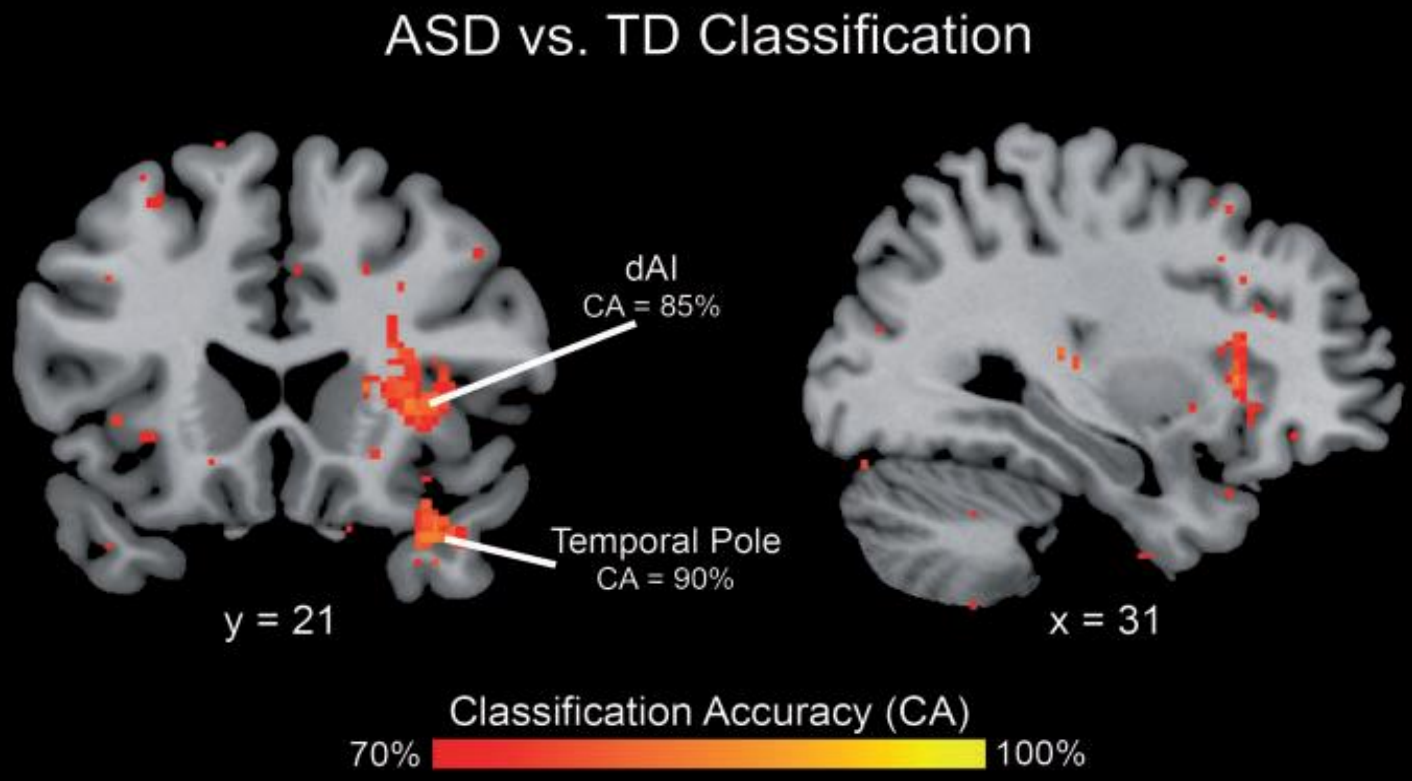
"Integrated neural maps of ongoing body states provide an effective neural interface for the detection of internal deviations from homeostatic range (stimuli), for the triggering of corrective responses (action programmes: drives and emotions), for determining when such corrective actions can be suspended and for generating the experiential component of the mapped body states (feelings)."

"…Moreover, by virtue of its cortical location at the crossroads of numerous pathways involved in higher cognition, the insula makes extensive connections to cortical regions related to memory, language and reasoning.
This suggests that although the insula is not necessary for experiencing feelings, it may be essential for the introduction of feelings into the flow of cognitive processes and thus facilitate the crosstalk between cognition and feeling. Such crosstalk may be necessary for the acquired rational control of drives and emotions, the absence of which would favour simpler behavioural patterns dominated by feeling states…."

Social Cognitive and Affective Neuroscience, 2016,

Insula response and connectivity during social and non-social attention in children with autism

Paola Odriozola, Lucina Q. Uddin, Charles J. Lynch, John Kochalka, Tianwen Chen, and Vinod Menon



Multivariate analysis revealed significant differences in spatial activation patterns between children with ASD and TD children in the dAI and in the temporal pole.

The advent of feelings was simultaneously the advent of the mind. Early organisms capable of feeling were, for the first time in evolution and unlike all other life forms, aware of some aspects of their own existence.

Feelings paved the way for the establishment of higher levels of cognition and consciousness, culminating in the modern human mind. Accordingly, shedding light on the underpinnings of feeling is likely to provide insights into consciousness and the mind.

emotion review
Emotion Review
Vol. 9 No. 3 (July 2017) 200–207

The Affective Core of Emotion: Linking Pleasure, Subjective Well-Being, and Optimal Metastability in the Brain

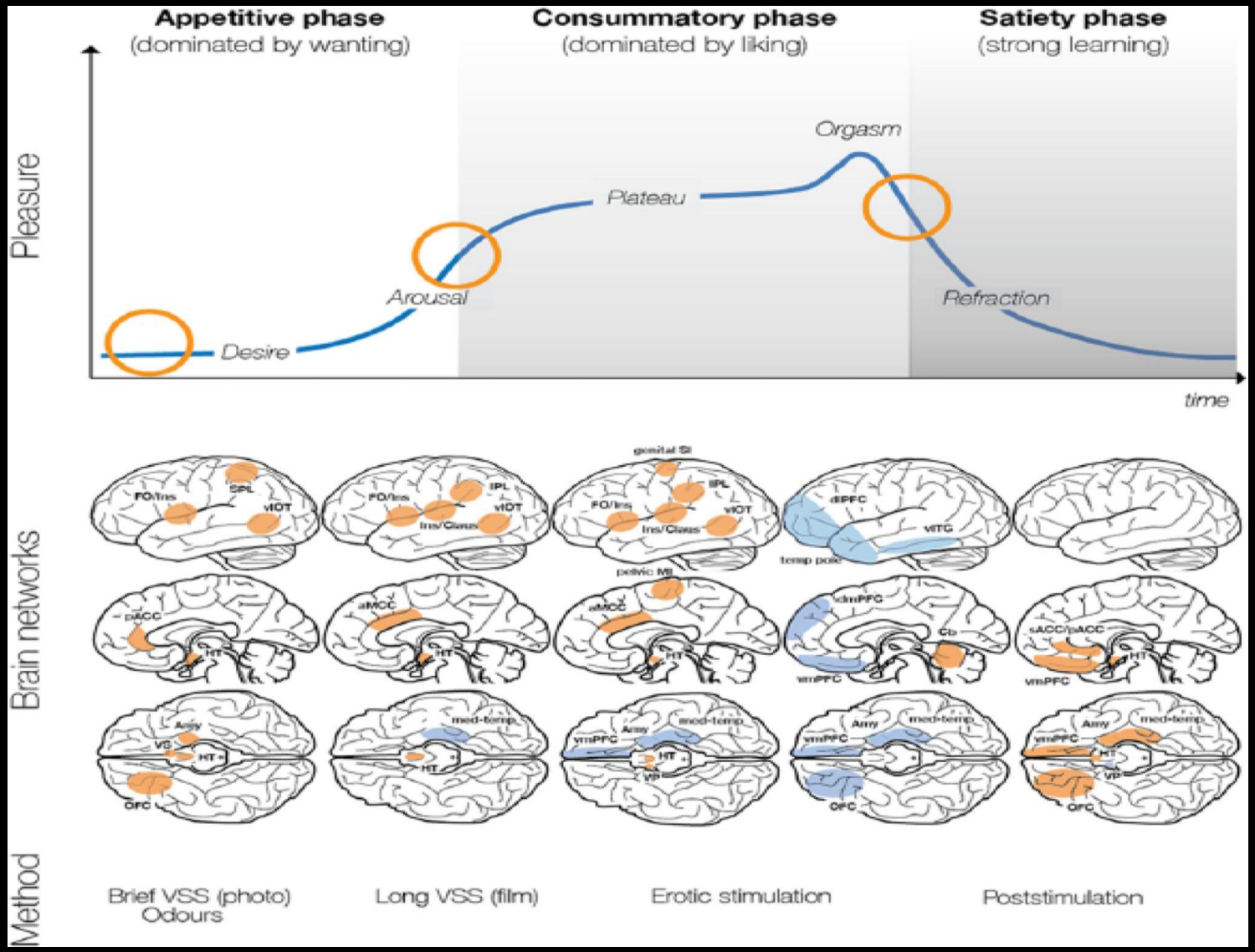
Kringelbach and Berridge

Emotions rely on an affective core – **"the pleasure system"** - which gives affective tone to emotion and interacts with cognitive appraisals.
Pleasure has positive hedonic valence, which can occur as either an objective 'liking' reaction or a subjective liking reaction to the hedonic impact of a stimulus and usually both together, whether a subjective feeling of pleasure is consciously felt or not.

The pleasure system is a composite psychological process requiring multiple interacting and time-varying contributions from **'liking,' 'wanting,' and "learning processes"** during the pleasure cycle

An "affective core" evaluates the positively and negatively valenced stimuli selectively captured by attentional processes and made available for conscious appraisal

The pleasure cycle: appetitive, consummatory, satiety phases



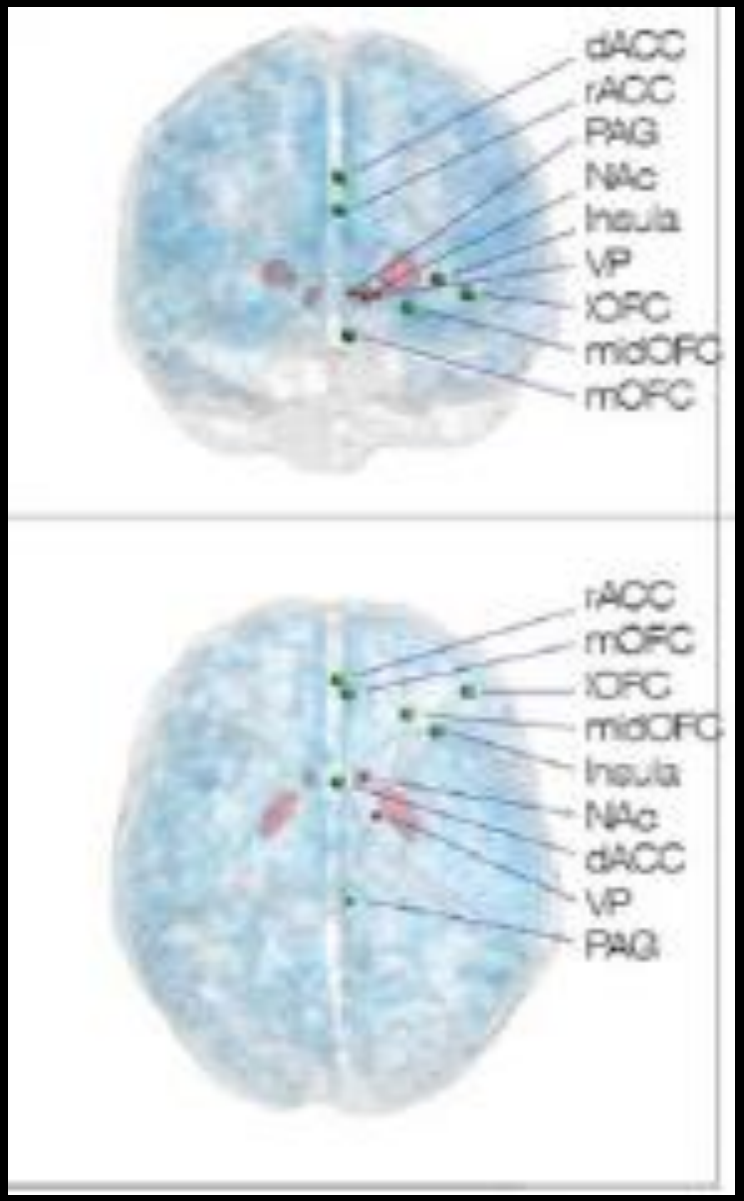
The pleasure system relies on a second component of reward, 'wanting' or incentive salience making stimuli attractive when attributed to them by widespread mesolimbic brain systems *(Berridge & Robinson, 2003)*.

This process is primarily, but not exclusively, driven by the neurotransmitter dopamine, which is not linked to pleasure.
During the pleasure cycle, the wanting system interacts closely with the pleasure system but is not identical to the hedonic impact or 'liking' of a reward *(Berridge, 2007)*.

The brain networks involved in 'wanting' are widespread and can become retuned by significant changes in the social environment (Reynolds & Berridge, 2008).

Pleasure is never merely a sensation nor a thought, but an additional **hedonic gloss** (Frijda, 2010), which is the pleasure versus displeasure affect that is actively **generated by the brain and attached to its sensory or cognitive object** (Berridge & Kringelbach, 2008).

This hedonic gloss of an object is generated by the brain in **dedicated networks of hedonic hotspots and coldspots** (Berridge & Kringelbach, 2015; Peciña & Berridge, 2005;



Neuroimaging has shown involvement of subcortical and cortical regions (e.g., orbitofrontal, insula, medial prefrontal, and cingulate cortices) to hedonic evaluations including

- anticipation,
- appraisal,
- experience,
- memory of pleasurable stimuli

The midanterior subregion of the orbitofrontal cortex

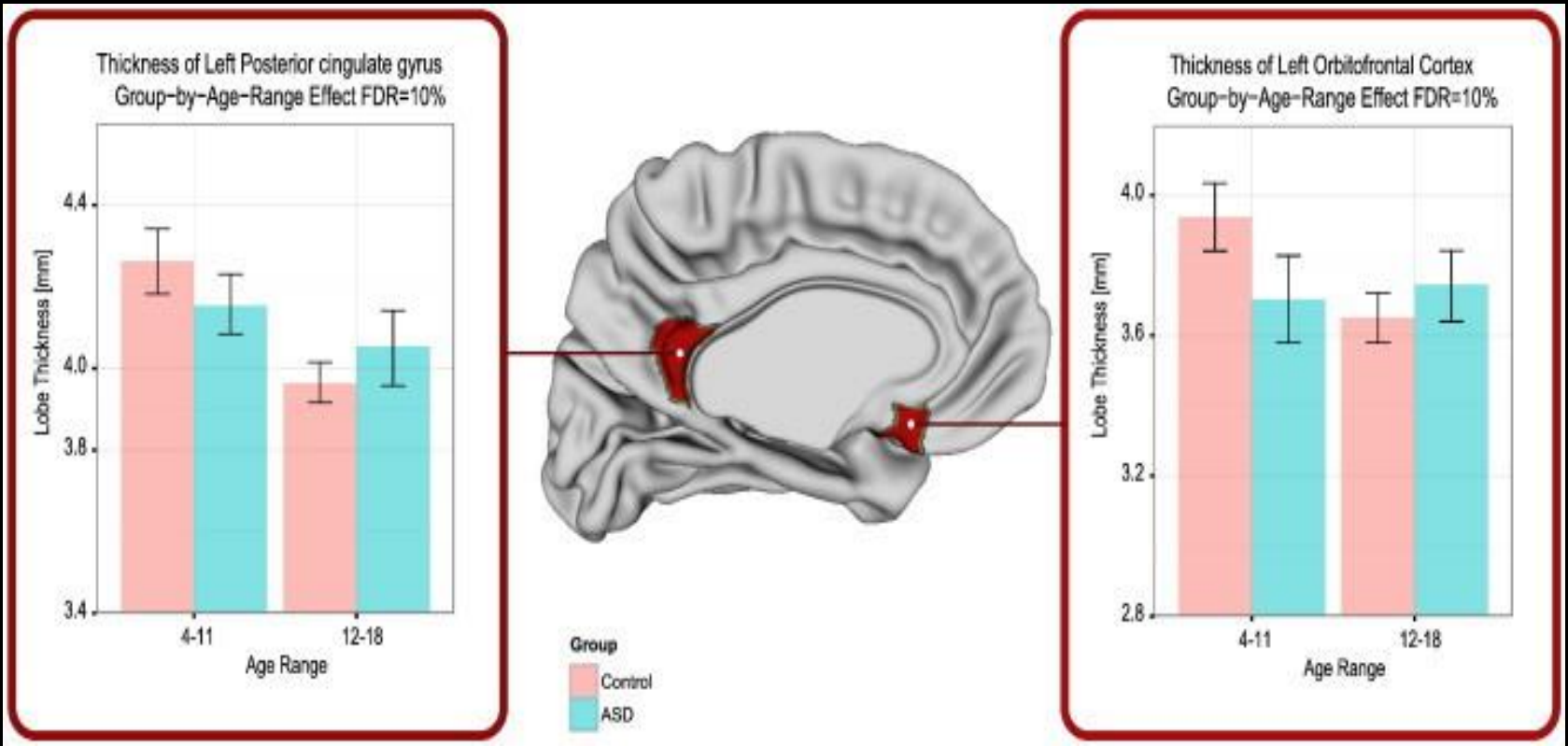
→ apex of pleasure system

- linking reward with hedonic experience including when they are no longer pleasant, that is, during selective satiation

NeuroImage: CLINICAL

The autism puzzle: Diffuse but not pervasive neuroanatomical abnormalities in children with ASD

D. Sussmana, R.C. Leunga, V.M. Vogana,W. Leea, S. Trellea, S. Lina, D.B. Cassela,M.M.Chakravartyb,c, J.P. Lerchd, E. Anagnostouf, M.J. Taylora



Review

CellPress

Predictions and the brain: how musical sounds become rewarding

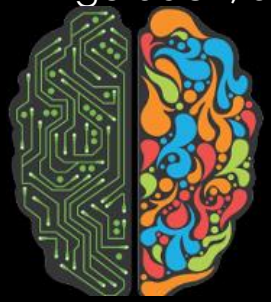
Valorie N. Salimpoor[1], David H. Zald[2], Robert J. Zatorre[3], Alain Dagher[3], and Anthony Randal McIntosh[1]

Perceiving sound events as pleasurable involves an intricate interplay between the dopaminergic system and cortical regions that contain

- previously acquired sound templates,
- track temporal and hierarchical structure,
- integrate emotions with reward value,
- detect internal states,
- assign reward value to stimuli,
- make value-based decisions about reward-related stimuli.

Computational models of expectation may be useful towards quantifying the link between predictability, neural activation, and the listener's experience

Recent advances in whole-brain computational modelling of human neuroimaging data have now opened the possibility of providing probabilistic causal information on the underlying networks and mechanisms (Cabral, Kringelbach, & Deco, 2014; Deco & Kringelbach, 2014)



The global dynamics of the whole-brain network are determined by the intrinsic dynamics of regions, that is, the dynamics of a region in absence of all couplings, as well as the extrinsic network couplings, allowing communication between the regions of the network.

Metastability.

Measures the variability of the states of phase configurations as a function of time and how the synchronization between the different regions fluctuates across time *(Cabral, Kringelbach, et al., 2014)*. the fast and slow processing characterizing human cognition (Kringelbach et al., 2015).

Could be linked to a state of Eudaimonia: optimal flow of information in the pleasure system and connected emotion processing networks, which could correspond to the feelings of subjective well-being

Functions of Positive Emotions: Gratitude as a Motivator of Self-Improvement and Positive Change

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Megan M. Fritz
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emotion review
Emotion Review
Vol. 9 No. 3 (July 2017) 200–207

- **Le emozioni negative sviluppano un "focus cognitivo ristretto" che facilita comportamenti orientati alla sopravvivenza**
- **Le emozioni positive**
  "espandono" l'orizzonte delle azioni e del pensiero:
  - **creatività**
  - **spinta alla novità e all'esplorazione**
  - **resilienza**
  - **promuovono lo sviluppo personale e della comunità**
  - **sono I tratti distintivi della FELICITA'**

Jennifer E. Stellar and cow.

Self-Transcendent Emotions and Their Social Functions: Compassion, Gratitude, and Awe Bind Us to Others Through Prosociality

emotion review

Emotion Review
Vol. 9 No. 3 (July 2017) 200–207

- **The self-transcendent emotions should be more strongly bounded by group membership than other positive states.**
- **The tendency to feel awe better predicted lower levels of proinflammatory cytokines** *(Stellar, John- Henderson, et al., 2015).*
- **Experiences of compassion activate healthier autonomic functioning in the form of greater parasympathetic system activation via the vagus nerve** *(Stellar, Cohen, et al., 2015; Stellar & Keltner, in press).*
- **Compassion have been associated with the release of oxytocin, which reduces activation of the hypothalamic-pituitary-adrenal axis and is negatively associated with cortisol** *(Barraza & Zak, 2009; Ditzen et al., 2009; Silvers & Haidt, 2008).*
- **Dispositional gratitude is a strong predictor of self-reported physical health, controlling for age and personality traits** *(Hill, Allemand, & Roberts, 2013).*
- **The self-transcendent emotions have also been associated with greater subjective well-being**

Psychological targeting as an effective approach to digital mass persuasion

S. C. Matz[a,1], M. Kosinski[b,2], G. Nave[c], and D. J. Stillwell[d,2]

12714–12719 | PNAS | November 28, 2017 | vol. 114 | no. 48

In three field experiments that reached over 3.5 million individuals with psychologically tailored advertising, we find that matching the content of persuasive appeals to individuals' psychological characteristics significantly altered their behavior.

The application of psychological targeting makes it possible to influence the behavior of large groups of people by tailoring persuasive appeals to the psychological needs of the target audiences.

The Observer Politics

Did Cambridge Analytica influence the Brexit vote and the US election?

Jamie Doward *and Alice Gibbs*

Sat 4 Mar 2017 22.30 GMT

The Guardian International edition

Ecosistema globale