

Boston, May 24th 2010 (16h15-17h00)

Understanding the Mind in Trademark Disputes: Practical Considerations for INTA's PON.

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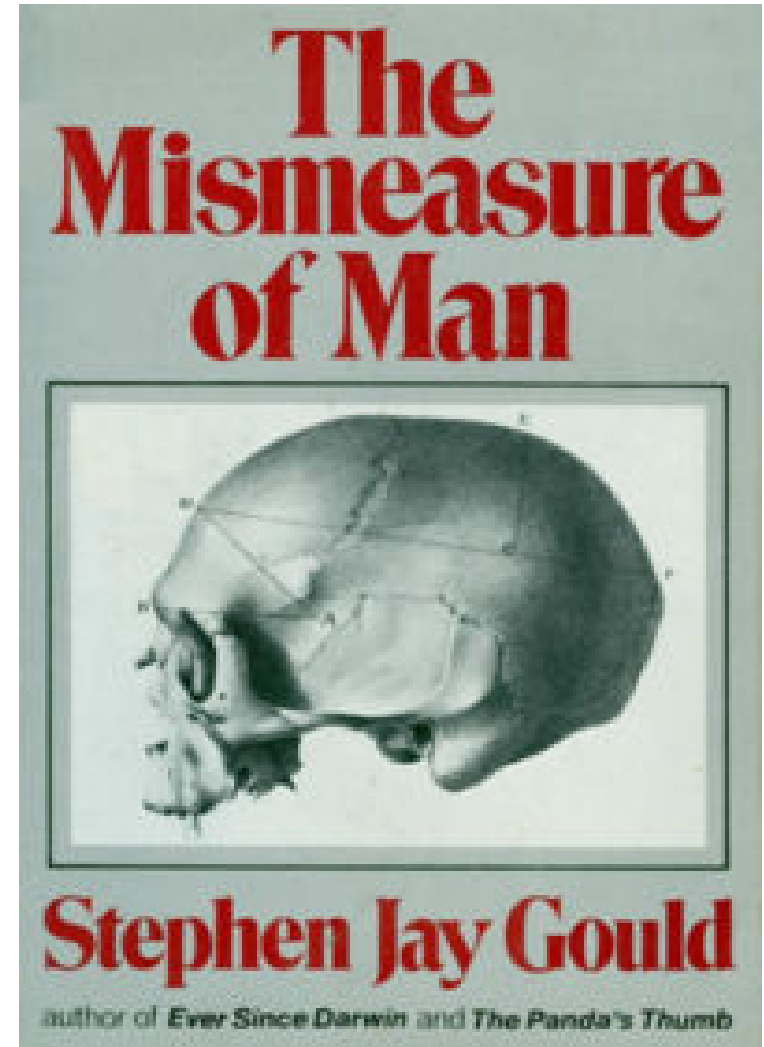
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General Caveat

- This sort of presentation is particularly dangerous when given by unqualified, non-scientific, dilettante lawyers!
- This presentation will be
 - Non-scientific
 - Non-empirical
 - Fundamentally flawed
 - Highly subjective
- Some of this will be blindingly obvious (e.g., Mr. Jourdain learning to speak in prose).





MRI Scan of a brain (Mark Lythgoe & Chloe Hutton/Wellcome Images)

Trademarks and Conflicts

"We do not see things as they are. We see things as we are"

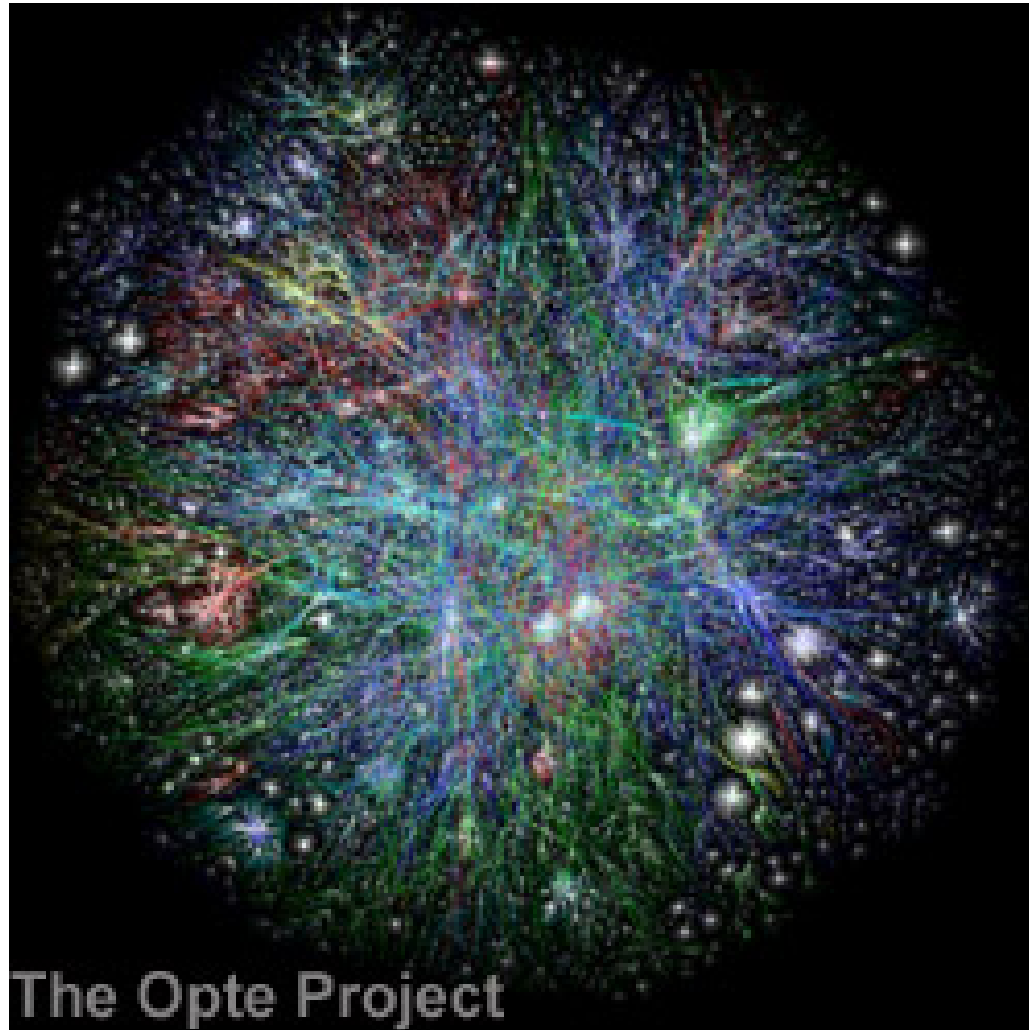
Anais Nin

The “Old World” Paradigm

NB. Apologies in advance to any colleagues this presentation may offend! Its goal is to promote discussion and self-exploration.



The “New World” Paradigm



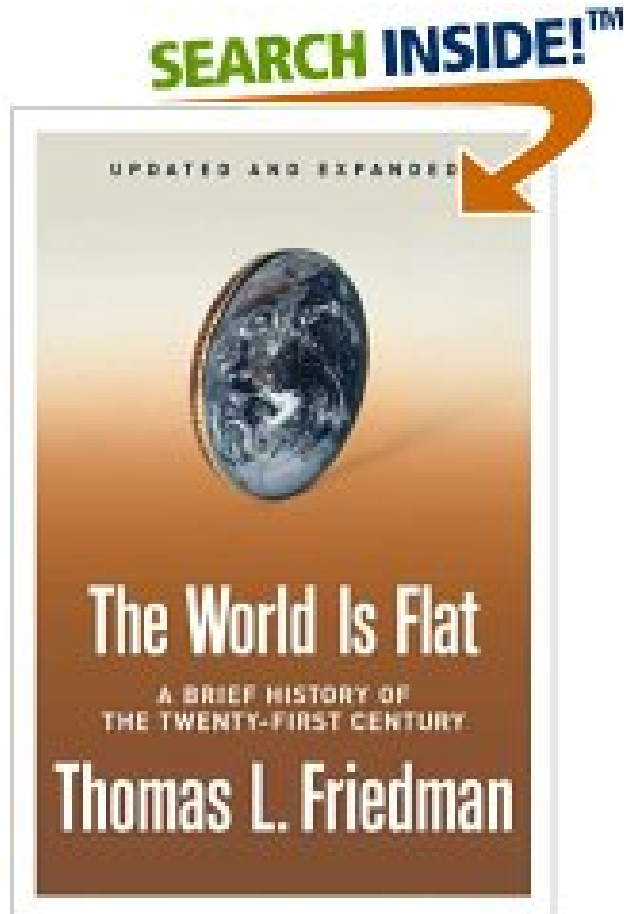
The Internet: This graph is by far our most complex. It is using over 5 million edges and has an estimated 50 million hop count. We will be producing more maps like this on a daily basis. We still have yet to fix the color system, but all in due time.

Asia Pacific - Red
 Europe/Middle East/Central Asia/Africa - Green
 North America - Blue
 Latin American and Caribbean - Yellow
 RFC1918 IP Addresses - Cyan
 Unknown - White

Source: <http://www.opte.org/maps/>

The world is changing

Source: http://www.amazon.com/World-Flat-Updated-Expanded-Twenty-first/dp/0374292795/sr=8-1/qid=1170718271/ref=pd_bbs_sr_1/103-1446205-6484642?ie=UTF8&s=books



The World Is Flat [Updated and Expanded]: A Brief History of the Twenty-first Century by Thomas L. Friedman

(Hardcover - April 18, 2006)

Hardcover: 608 pages

Publisher: Farrar, Straus and Giroux; Expanded and Updated edition (April 18, 2006)

Language: English

ISBN-10: 0374292795

ISBN-13: 978-0374292799

Consumerism -- Globalization -- Technology

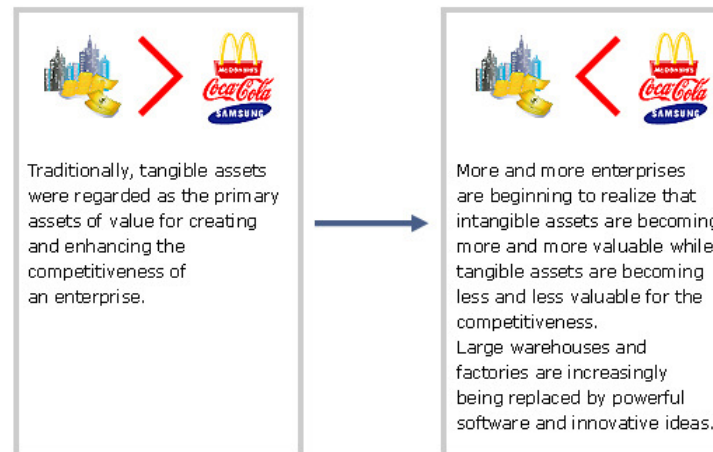
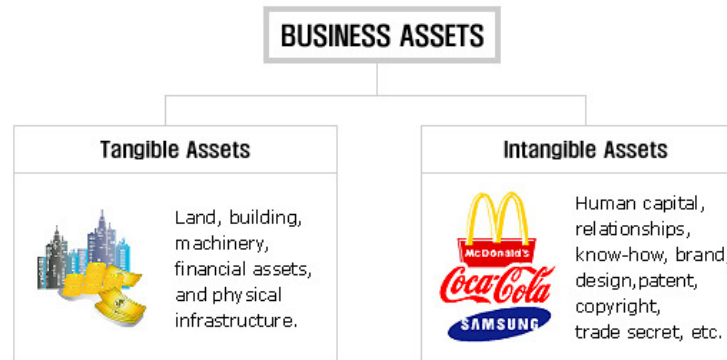
The Growing Importance of IP Assets

“How appropriate is our system – developed for a world in which physical assets predominated – for an economy in which value increasingly is embodied in ideas rather than tangible capital?”

Alan Greenspan April 4, 2003

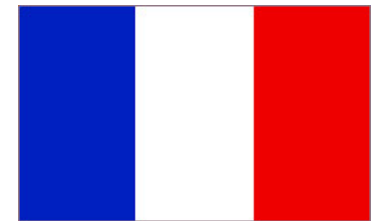
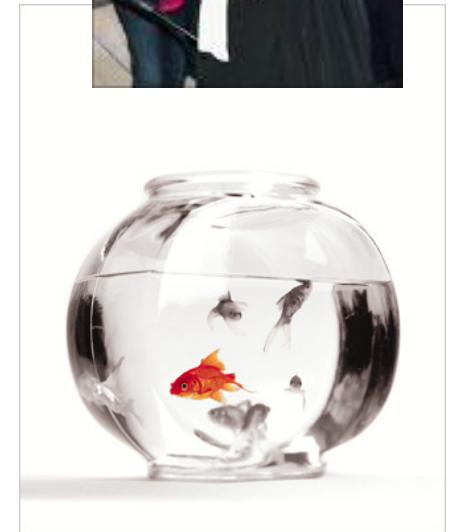
“It is estimated that by 2007 as much as 90% of the value of the world’s top 2000 enterprises will consist of intellectual property”

PriceWaterhouseCoopers 2003



Source IP PANORAMA 01 Slide 6/23
<http://www.wipo.int/sme/en/multimedia/flash/01/>

The Danger = Fish in (national) fishbowls



This is compounded by split specialisms in the IP profession

The “new world” requires kaleidoscopic vision



Source: <http://bindweed.com/magicmirror/kaleidoscope-collage.gif>

The Ever-Increasing Importance of Brands



ALL BRANDS
ARE NOT
CREATED EQUAL

Best Global Brands 2007

Interbrand

BusinessWeek

“In the highly competitive global marketplace, a business is fully identified by and associated with its brands. Arguably, brand value is one of the most important - if not the most important asset that a business holds. ... Brands are powerful **symbols that influence consumer choices and affect investment.** Successful brands, underpinned by trademark protection, are **a signal of a company's ability to deliver on a promise.**”

Kamel Idris -- WIPO

Source: http://www.businessweek.com/magazine/content/09_39/b4148038492933.htm

Interbrand Top 100 (2008): the power visual of logos

2008 Rank	2007 Rank	Brand	Country of Origin	Sector	2008 Brand Value (\$m)	Change in Brand Value
1	1		US	Beverages	65,667	2%
2	3		US	Computer Services	59,031	3%
3	2		US	Computer Software	59,007	1%
4	4		US	Diversified	53,086	3%
5	5		Finland	Consumer Electronics	35,342	7%
6	6		Japan	Automotive	34,050	6%
7	7		US	Computer Hardware	31,261	1%
8	8		US	Restaurants	31,049	6%
9	9		US	Media	29,251	0%
10	20		US	Internet Services	25,590	43%
11	10		Germany	Automotive	25,577	9%
12	12		US	Computer Hardware	23,509	6%
13	13		Germany	Automotive	23,298	8%
14	14		US	Personal Care	22,069	8%
15	15		US	Financial Services	21,940	5%
16	17		France	Luxury	21,602	6%
17	18		US	Computer Services	21,306	12%
18	14		US	Tobacco	21,300	0%
19	11		US	Financial Services	20,174	-14%
20	19		Japan	Automotive	19,079	6%
21	21		South Korea	Consumer Electronics	17,689	5%
22	-		Sweden	Apparel	13,840	NEW
23	27		US	Computer Software	13,831	11%
24	33		US	Consumer Electronics	13,724	24%
25	25		Japan	Consumer Electronics	13,583	5%
26	26		US	Beverages	13,249	3%
27	23		UK	Financial Services	13,143	-3%
28	24		Switzerland	Beverages	13,055	1%
29	29		US	Sporting Goods	12,672	6%
30	28		US	Transportation	12,621	5%
31	34		Germany	Computer Software	12,228	13%
32	31		US	Computer Hardware	11,696	1%
33	30		US	Alcohol	11,438	-2%
34	22		US	Financial Services	11,399	-21%
35	38		Sweden	Home Furnishings	10,913	8%
36	36		Japan	Computer Hardware	10,876	3%
37	32		US	Financial Services	10,773	-6%
38	35		US	Financial Services	10,331	-3%
39	40		US	Food	9,710	4%
40	44		Japan	Consumer Electronics	8,772	13%
41	39		Switzerland	Financial Services	8,740	-11%
42	37		US	Financial Services	8,696	-16%
43	42		Netherlands	Diversified	8,326	8%
44	-		Canada	Media	8,313	NEW
45	46		Italy	Luxury	8,254	7%
46	48		US	Internet Services	7,991	7%
47	50		US	Computer Services	7,948	9%
48	43		Germany	Diversified	7,943	3%
49	41		US	Automotive	7,896	-12%
50	45		US	Automotive	7,609	-1%
51	51		France	Personal Care	7,508	7%
52	52		US	Media	7,193	4%
53	54		Germany	Automotive	7,047	8%
54	47		US	Financial Services	7,022	-6%
55	49		France	Financial Services	7,001	-4%
56	53		US	Food	6,846	2%
57	57		US	Personal Care	6,437	7%
58	62		US	Internet Services	6,434	19%
59	56		US	Computer Hardware	6,393	6%
60	58		France	Luxury	6,355	9%
61	59		US	Food	6,305	6%
62	64		Spain	Apparel	5,955	15%
63	63		Switzerland	Food	5,592	5%
64	60		US	Restaurants	5,582	-2%
65	55		US	Internet Services	5,496	-9%
66	67		France	Food	5,408	8%
67	68		Germany	Automotive	5,407	11%
68	65		US	Diversified	5,288	5%
69	65		US	Personal Care	5,264	3%
70	69		Germany	Sporting Goods	5,072	6%
71	71		Switzerland	Luxury	4,956	8%
72	72		South Korea	Automotive	4,846	9%
73	-		Canada	Consumer Electronics	4,802	NEW
74	70		US	Personal Care	4,636	1%
75	75		Germany	Automotive	4,603	9%
76	73		France	Luxury	4,575	8%
77	61		US	Apparel	4,357	-20%
78	78		Japan	Consumer Electronics	4,281	4%
79	83		Switzerland	Luxury	4,236	10%
80	79		US	Luxury	4,208	5%
81	74		US	Restaurants	4,097	-4%
82	80		Germany	Financial Services	4,033	2%
83	85		France	Alcohol	3,951	6%
84	84		UK	Energy	3,911	1%
85	88		US	Restaurants	3,879	7%
86	81		Netherlands	Financial Services	3,768	-3%
87	77		US	Consumer Electronics	3,721	-10%
88	89		US	Consumer Electronics	3,682	2%
89	91		UK	Alcohol	3,590	6%
90	92		Japan	Automotive	3,588	7%
91	94		Italy	Luxury	3,585	9%
92	90		US	Personal Care	3,582	4%
93	-		Italy	Automotive	3,527	NEW
94	-		Italy	Luxury	3,526	NEW
95	87		France	Alcohol	3,513	-3%
96	-		US	Hospitality	3,502	NEW
97	93		Netherlands	Energy	3,471	4%
98	96		Germany	Personal Care	3,401	9%
99	-		US	Transportation	3,359	NEW
100	-		US	Financial Services	3,338	NEW








The problem: IP = Global needs, but national laws:

We Can No Longer Think Nationally or by “IP category”!

- Different rights per country: e.g., ® v. ™, ©
- IP issues are increasingly interlinked (*TM + patent + design + © + sui generis databases + Internet + ...*)
- Different standards of “inventorship/authorship”/ownership
- Different impacts of co-ownership
- Antitrust and Competition Law issues
- Different enforcement procedures: venues, jurisdictions, scopes of relief, judges etc.
- NB: A valid national IP right ≠ an internationally valid/enforceable IP right
- IP rights raise issues of public policy/*ordre public*

= COMPLEX, EXPENSIVE, INCONSISTENT, INEFFICIENT

IP Valuations = a source for new disputes: what methods?

2008 Rank	2007 Rank	Brand	Country of Origin	Sector	2008 Brand Value (\$m)	Change in Brand Value
1	1		US	Beverages	66,667	2%
2	3		US	Computer Services	59,031	3%
3	2	Microsoft	US	Computer Software	59,007	1%
4	4		US	Diversified	53,086	3%
5	5	NOKIA	Finland	Consumer Electronics	35,942	7%
6	6		Japan	Automotive	34,050	6%
7	7		US	Computer Hardware	31,261	1%
8	8		US	Restaurants	31,049	6%
9	9		US	Media	29,251	0%
10	20	Google	US	Internet Services	25,590	43%

The Interbrand "Top 10" (2008)

The source of all disputes

IncoMprehEnsion!



Conflict as an Iceberg

A dispute is never about what it is about...

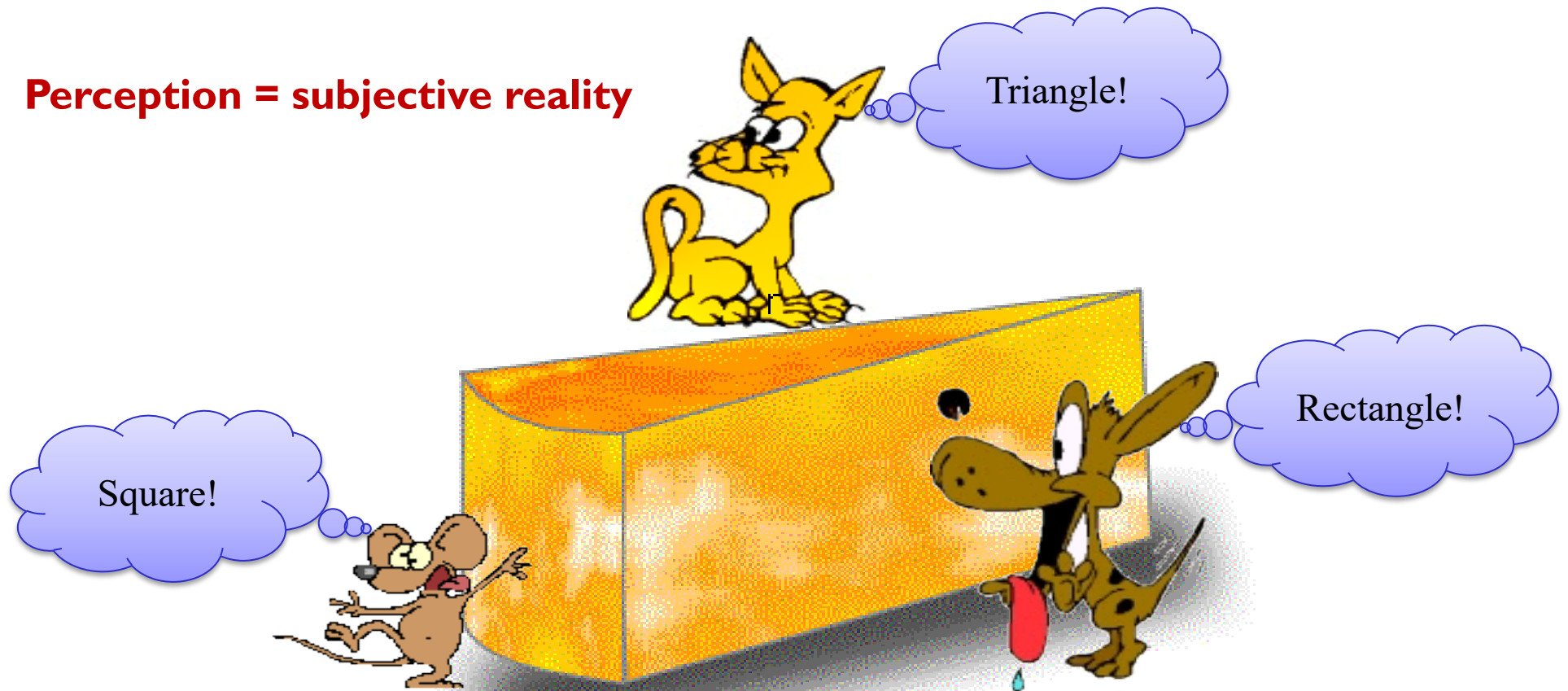


Although the “objective” aspects of the dispute may be apparent...

...the “subjective” aspects remain to be discovered.

Conflict as a piece of cheese ...

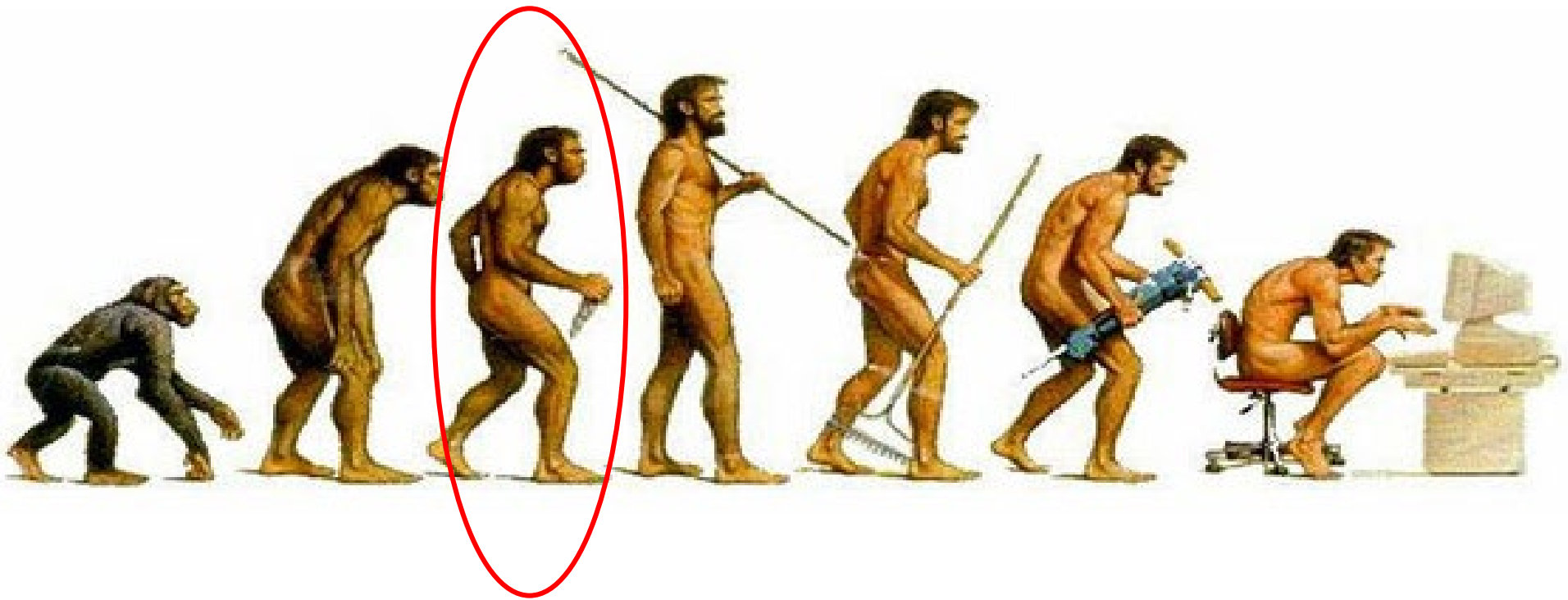
Perception = subjective reality



“It isn’t that they can’t see the solution,
it is that they can’t see the problem”

Gilbert K. Chesterton

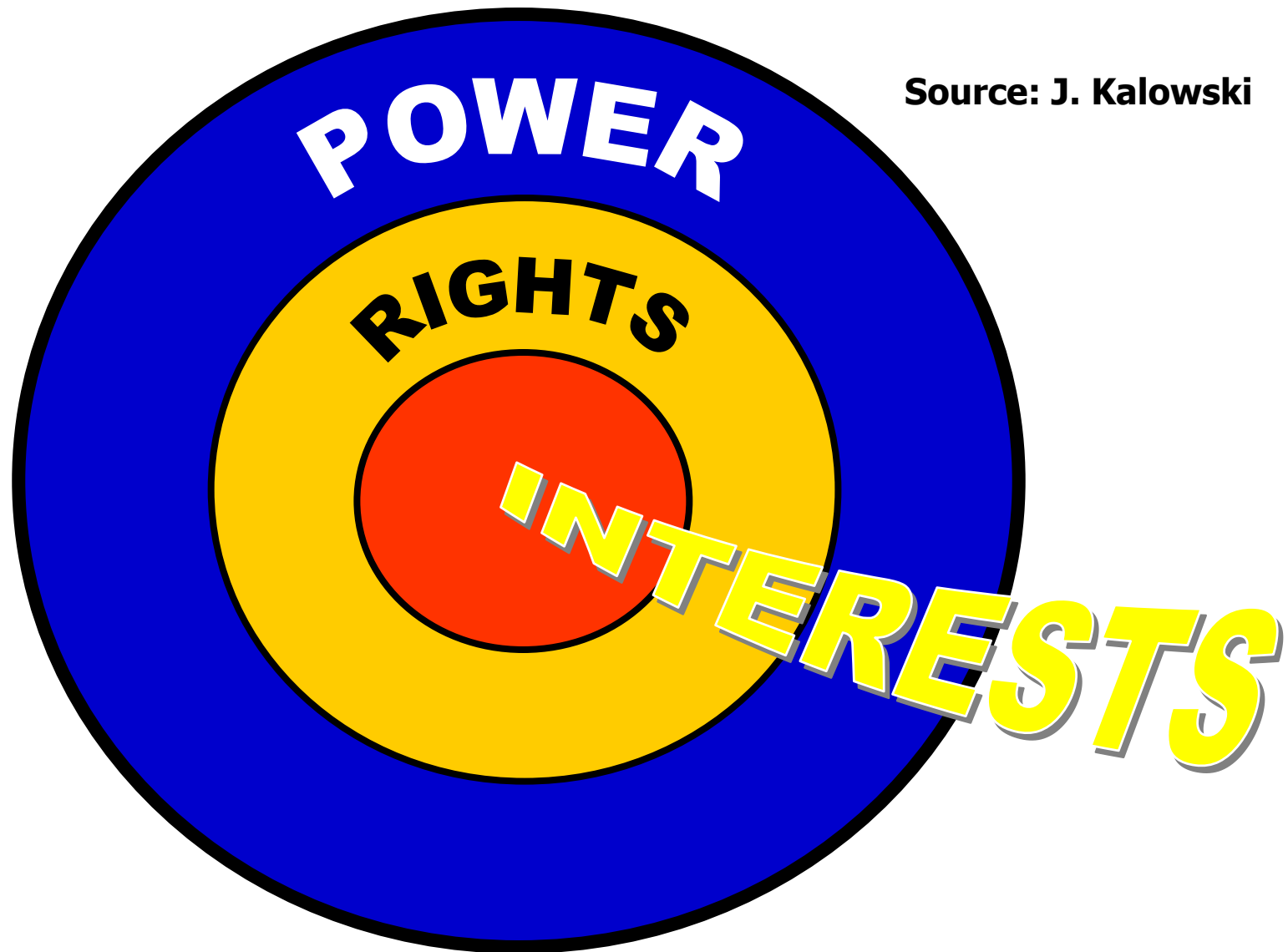
How well have we evolved in resolving conflicts?



www.didntyouhear.com/wp-content/uploads/2006/10/evolution1.jpg

Possible Approaches to Conflict

Source: J. Kalowski



Will demand for ADR change?

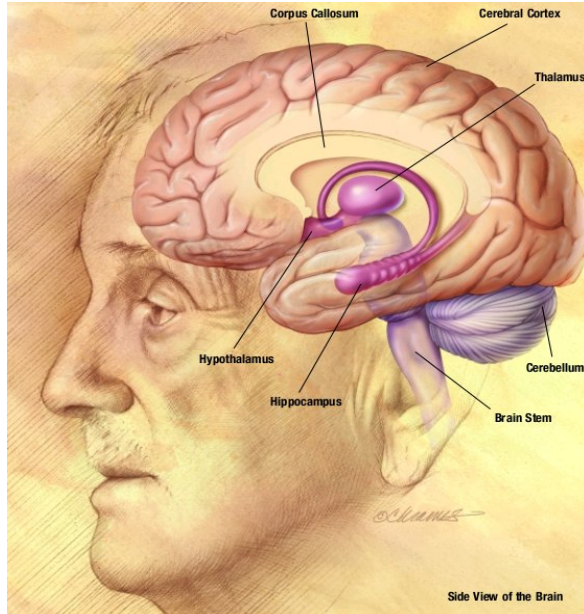
*In the new economy,
those who live by the sword
will be **SHOT** by those
who don't*

Gary Hamel

**"The world's leading expert on
business strategy"
Fortune Magazine**



Source: Michael Leathes



An Introduction to Affective Neurosciences

"We do not see things as they are. We see things as we are"

Anais Nin

The Affective Revolution

- ▶ CISA, a world centre for interdisciplinary research in affective sciences
- ▶ Emotions start being considered a critical determinant of human behaviour in most sciences and in the humanities
- ▶ Main disciplines involved:
 - ▶ Psychology
 - ▶ Neuroscience
 - ▶ Philosophy
 - ▶ Sociology
 - ▶ Anthropology
 - ▶ Economics
 - ▶ Law ...



CISA = Swiss Center for Affective Sciences. www.affective-sciences.org

Perception & Reality

We need to take a new look at ourselves

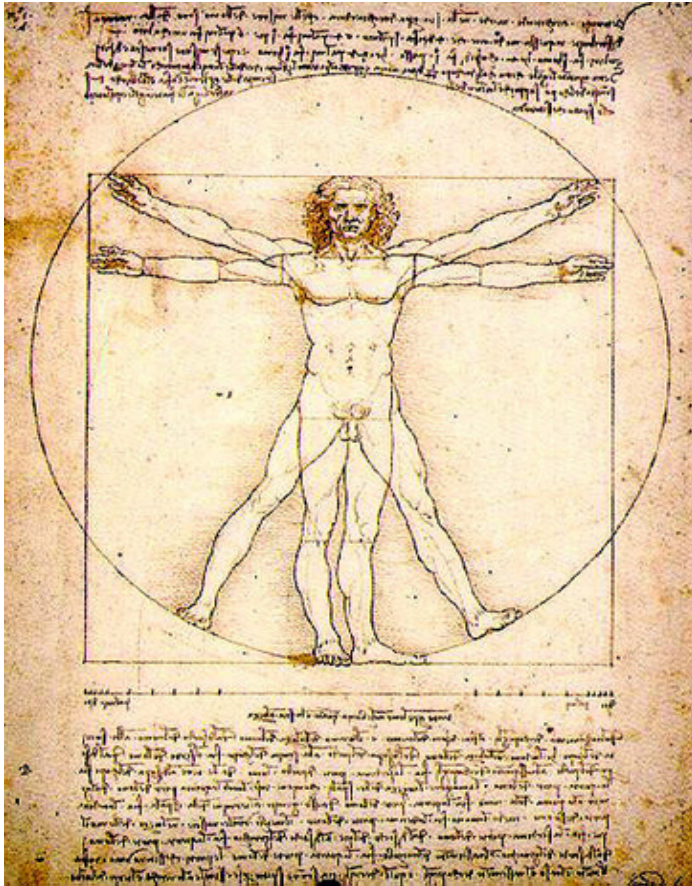
BELIEFS **≠** **REALITY**

"We do not see things as they are. We see things as we are"

Anais Nin

Perception of self and “the other”

We need to take a new look at ourselves



Vitruvian Man

How we like to perceive ourselves

≠



Sensory Cortex Homunculus Man

How our brains are actually wired

<http://drfpoulin.wordpress.com/>

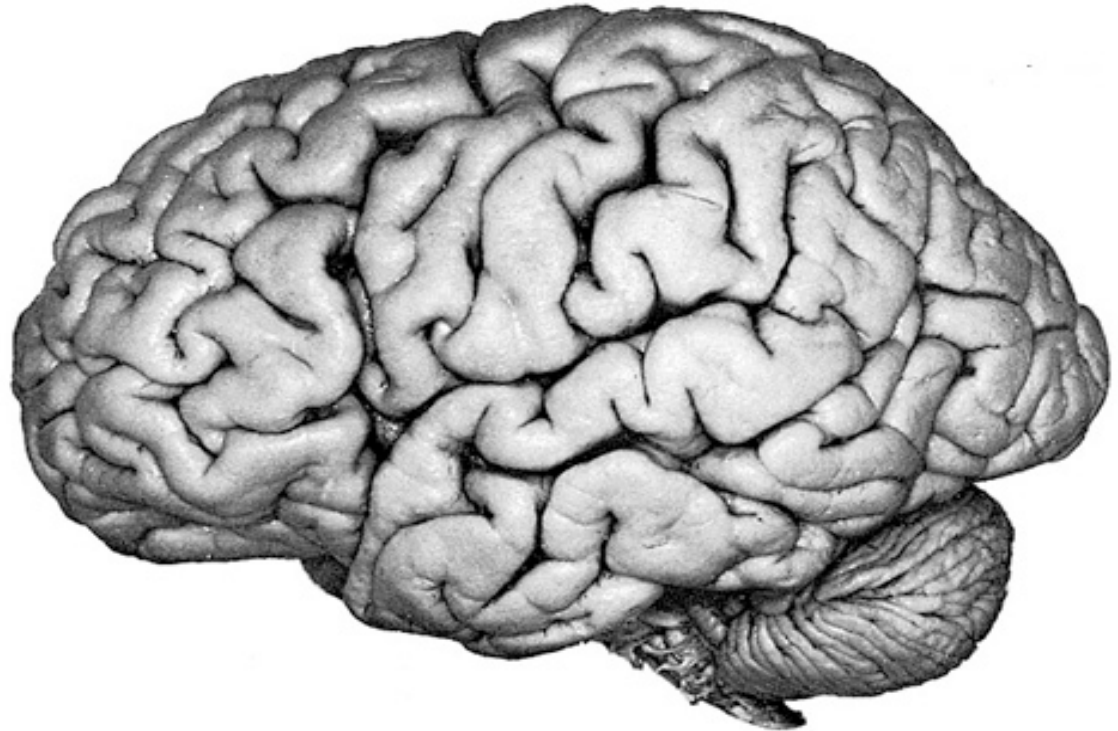
The cause: the Human Brain

Brain Bulletin #54 - 6 Things You Didn't Know About Your Brain

Terry Small (www.terrysmall.com/bb_54.asp)

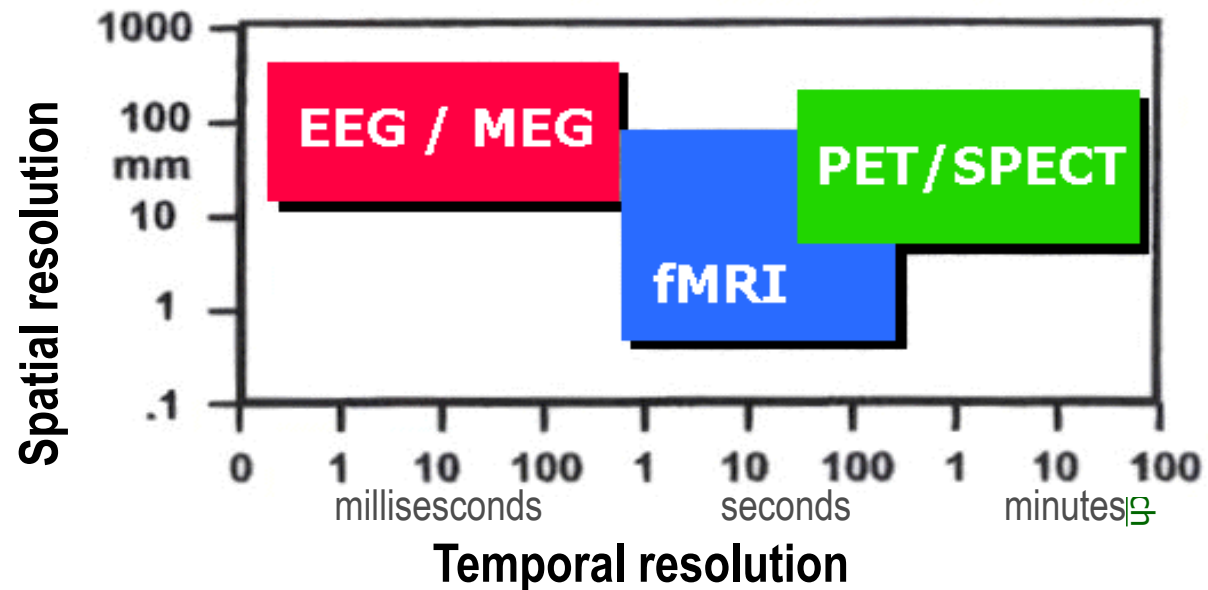
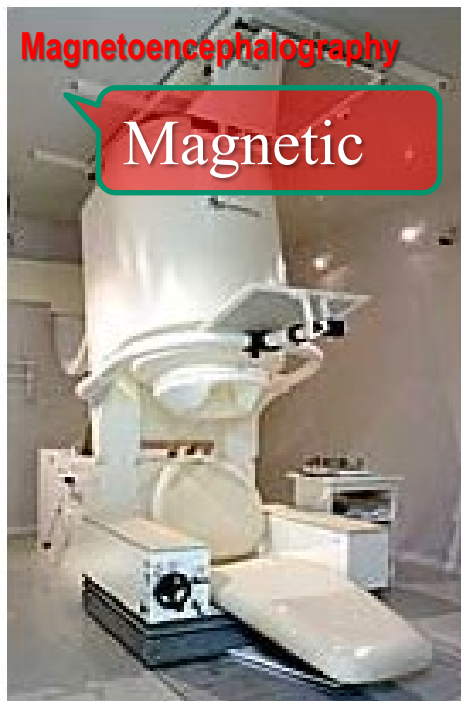
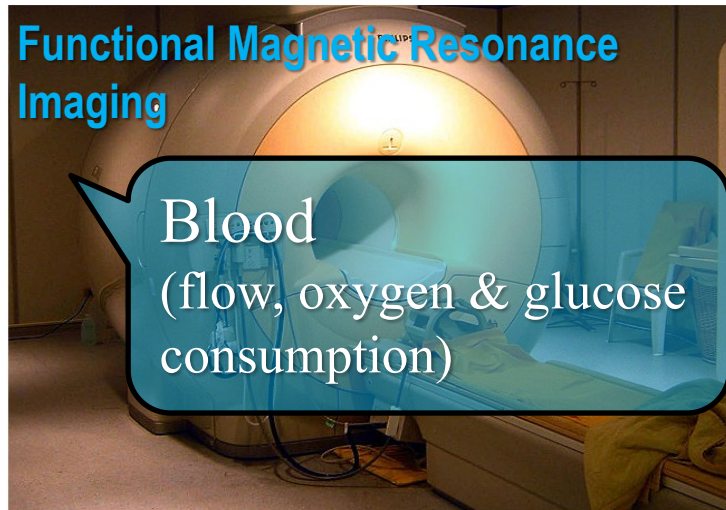
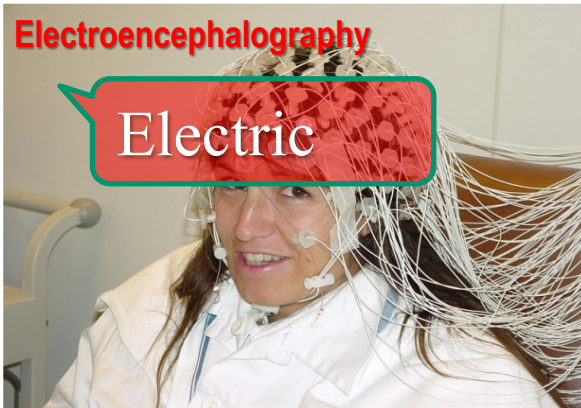
Here are 6 things you probably didn't know about your brain:

1. Your brain is a 3 pound universe....wrapped in tissue and bone....it is proportionately larger than in any other creature on earth.
2. Your brain is just 2% of your body weight....yet demands 20% of your blood flow and 20% of your oxygen.
3. The number of physical thought pathways that your brain can potentially create is the number 1 followed by 10.5 million kilometers of standard font zeros.
4. The one hundred million neurons in your brain can create more ideas than the number of atoms in the known universe.
5. These ideas zip around in your brain at 428 kilometers per hour!
6. Your brain's total capacity for data storage is a terabyte of terabytes (i.e., 10^9 Gigabytes)



Yet for all of the scientific study of the brain ... much remains a mystery.

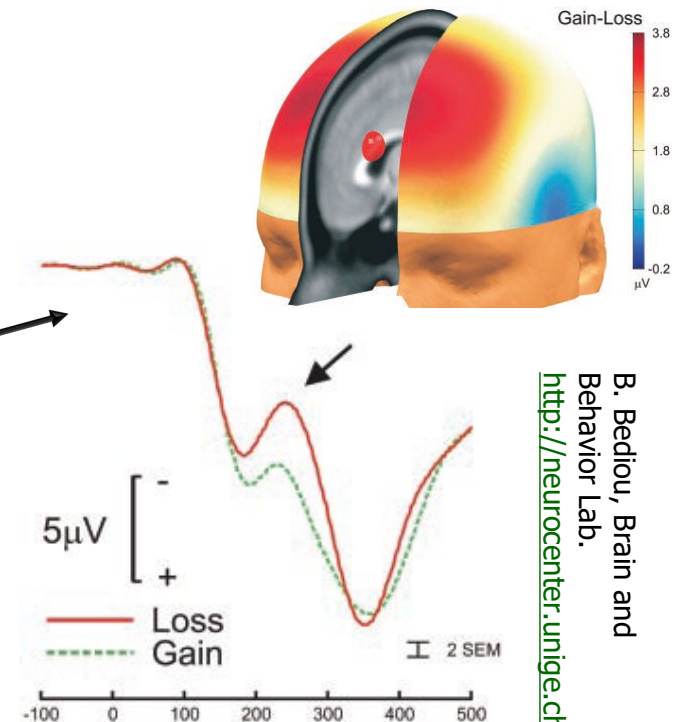
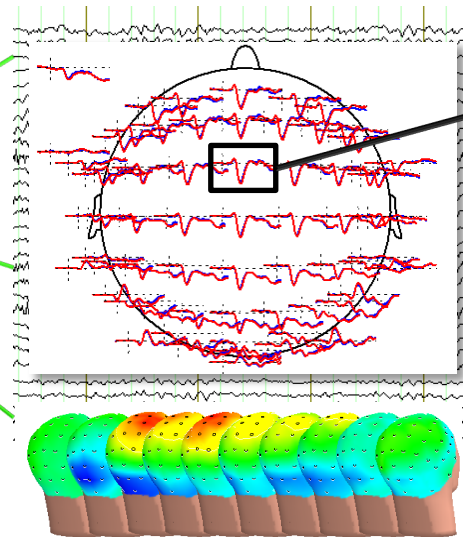
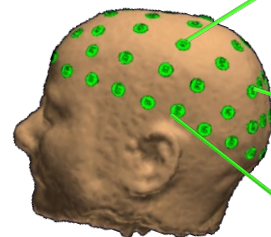
Brain activity measures



B. Bediou, Brain and Behavior Lab.
<http://neurocenter.unige.ch>

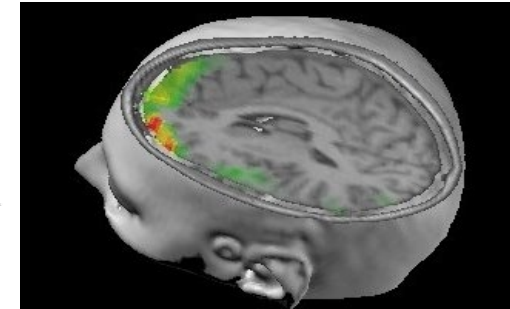
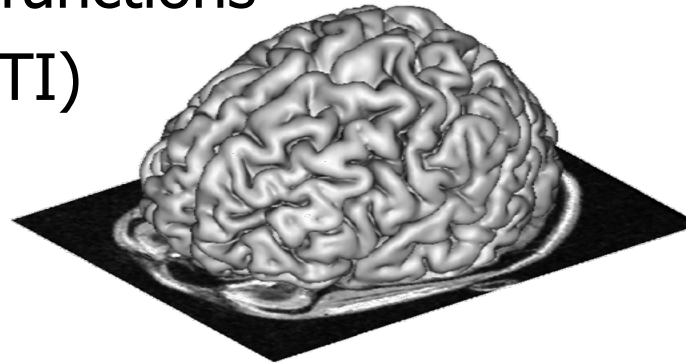
EEG/MEG

- Measures electric/magnetic activity of the brain (neurons)
- Excellent temporal resolution but poor spatial resolution
 - Spatiotemporal processing
 - Lateralisation
 - Synchronization

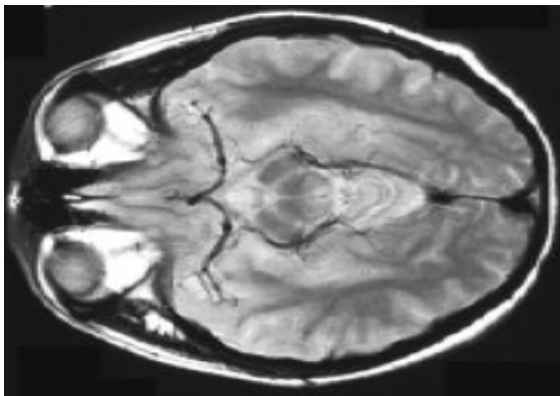


fMRI/PET

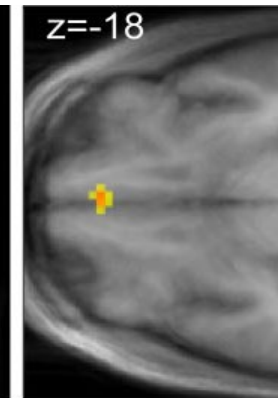
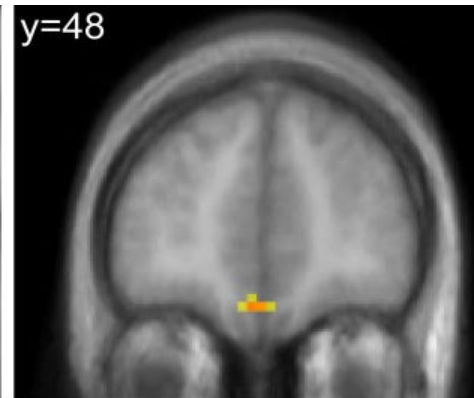
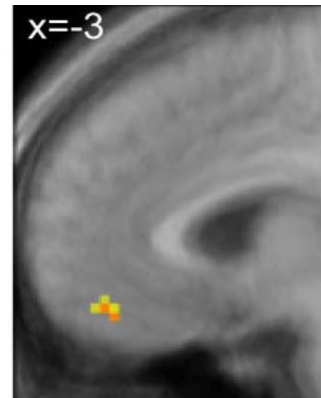
- Measures blood flow, oxygen or glucose consumption
- Good spatial resolution but poor temporal resolution
 - Brain structures and functions
 - Brain connections (DTI)
 - Connectivity



Structural



Functional (stats)



Source: Bediou,
Brain and Behavior
Lab., Geneva CH
<http://neurocenter.unige.ch>

fMRI: An art or a science? Beware of Dead Salmon!



Neural correlates of interspecies perspective taking in the post-mortem Atlantic Salmon: An argument for multiple comparisons correction

Craig M. Bennett¹, Abigail A. Baird², Michael B. Miller¹, and George L. Wolford³

¹ Psychology Department, University of California Santa Barbara, Santa Barbara, CA; ² Department of Psychology, Vassar College, Poughkeepsie, NY;

³ Department of Psychological & Brain Sciences, Dartmouth College, Hanover, NH

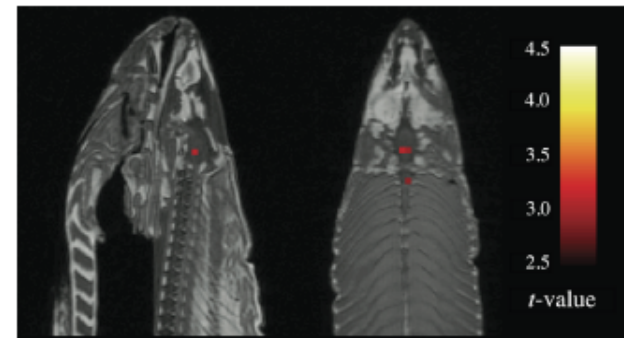
INTRODUCTION

With the extreme dimensionality of functional neuroimaging data comes extreme risk for false positives. Across the 130,000 voxels in a typical fMRI volume the probability of a false positive is almost certain. Correction for multiple comparisons should be completed with these datasets, but is often ignored by investigators. To illustrate the magnitude of the problem we carried out a real experiment that demonstrates the danger of not correcting for chance properly.

DISCUSSION

Can we conclude from this data that the salmon is engaging in the perspective-taking task? Certainly not. What we can determine is that random noise in the EPI timeseries may yield spurious results if multiple comparisons are not controlled for. Adaptive methods for controlling the FDR and FWER are excellent options and are widely available in all major fMRI analysis packages. We argue that relying on standard statistical thresholds ($p < 0.001$) and low minimum cluster sizes ($k > 8$) is an ineffective control for multiple comparisons. We further argue that the vast majority of fMRI studies should be utilizing multiple comparisons correction as standard practice in the computation of their statistics.

GLM RESULTS



A t -contrast was used to test for regions with significant BOLD signal change during the photo condition compared to rest. The parameters for this comparison were $t(131) > 3.15$, $p(\text{uncorrected}) < 0.001$, 3 voxel extent threshold.

Several active voxels were discovered in a cluster located within the salmon's brain cavity (Figure 1, see above). The size of this cluster was 81 mm^3 with a cluster-level significance of $p = 0.001$. Due to the coarse resolution of the echo-planar image acquisition and the relatively small size of the salmon brain further discrimination between brain regions could not be completed. Out of a search volume of 8064 voxels a total of 16 voxels were significant.

Identical t -contrasts controlling the false discovery rate (FDR) and familywise error rate (FWER) were completed. These contrasts indicated no active voxels, even at relaxed statistical thresholds ($p = 0.25$).

fMRI, TMs & Priming: e.g., The Coke v. Pepsi challenge

Neuron, Vol. 44, 379-387, October 14, 2004, Copyright ©2004 by Cell Press

Neural Correlates of Behavioral Preference for Culturally Familiar Drinks

Kim S. Cypert, Latané M. Montague,
and P. Read Montague*
Department of Neuroscience
Menninger Department of Psychiatry
and Behavioral Sciences
Baylor College of Medicine
1 Baylor Plaza
Houston, Texas 77030

Summary

Coca-Cola® (Coke®) and Pepsi® are nearly identical in chemical composition, yet humans routinely display strong subjective preferences for one or the other. This simple observation raises the important question of how cultural messages combine with content to shape our perceptions; even to the point of modifying behavioral preferences for a primary reward like a sugared drink. We delivered Coke and Pepsi to human subjects in behavioral taste tests and also in passive experiments carried out during functional magnetic resonance imaging (fMRI). Two conditions were examined: (1) anonymous delivery of Coke and Pepsi and (2) brand-cued delivery of Coke and Pepsi. For the anonymous task, we report a consistent neural response in the ventromedial prefrontal cortex that correlated with subjects' behavioral preferences for these beverages. In the brand-cued experiment, brand knowledge for one of the drinks had a dramatic influence on expressed behavioral preferences and on the measured brain responses.

Seeing the logo changes the taste!

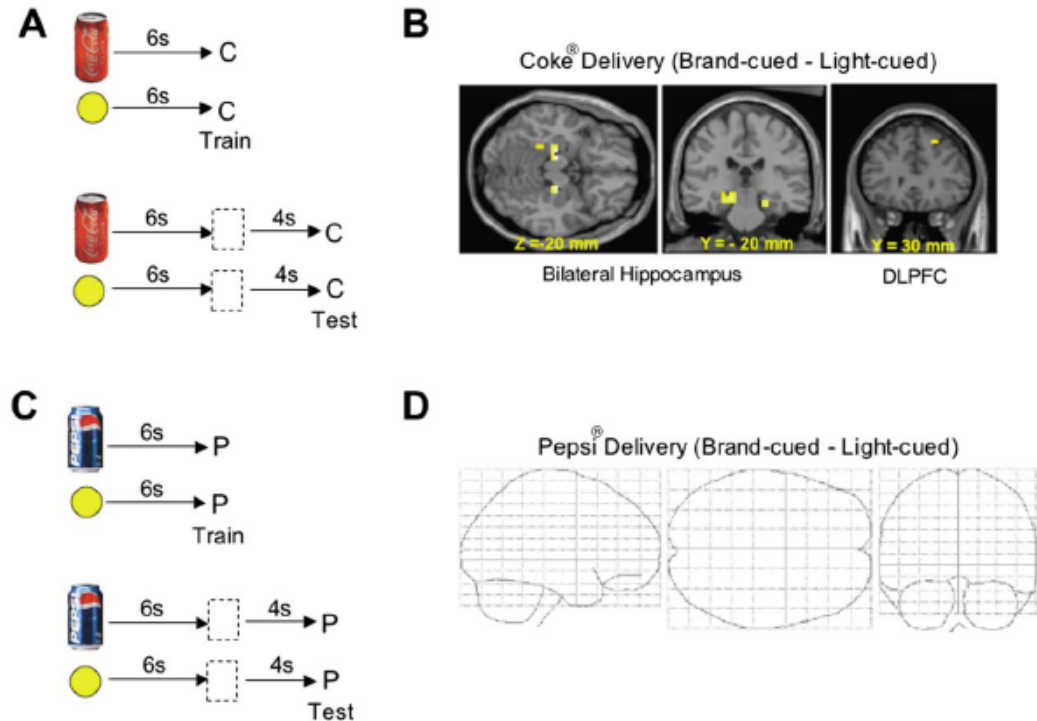


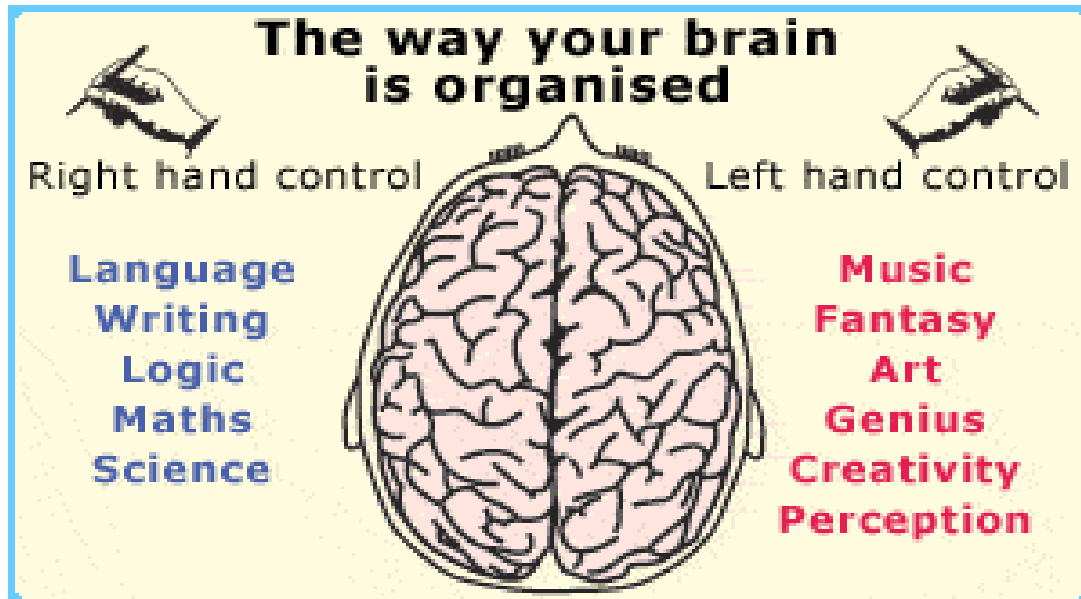
Figure 4. Effect of Brand Knowledge on Brain Responses in Semianonymous Tasks

(A) An image of a Coke can was used to cue the occurrence of Coke. A red or yellow circle (randomized across subjects) predicted the other. Both sodas delivered were Coke.
 (B) Coke delivered following an image of a Coke can evoked significantly greater activity in several regions when contrasted against Coke delivered following a neutral flash of light. Significant activations ($p < 0.001$, uncorrected) were found bilaterally in the hippocampus (MNI coordinates $[-24, -24, -20]$ and $[20, -20, -16]$), in the left parahippocampal cortex (MNI coordinates $[-20, -32, -8]$), midbrain (MNI coordinates $[-12, -20, -16]$), and dorsolateral prefrontal cortex (MNI coordinates $[20, 30, 48]$). See Table 1 for details.
 (C) In the scanner, an image of a Pepsi can was used to cue the occurrence of Pepsi. A red or yellow circle predicted the other soda, and both sodas delivered were Pepsi.
 (D) No voxels survive $p < 0.001$ threshold (uncorrected) for the equivalent contrast in the semianonymous Pepsi experiment.

Why do consumers behave the way they do?

- <http://video.msn.com/v/us/msnbc.htm?g=2fa22e7a-0f78-428c-8d43-5aba1673a435&f=00&fg=email>

Brain Regionalisation: A Metaphor for Conflict



From the Introduction to
A WHOLE NEW MIND, Daniel Pink.

Concept: Michael Leathes

http://news.bbc.co.uk/cbbcnews/hi/sci_tech/newsid_2191000/2191138.stml

*"Your brain is divided into two hemispheres. The left hemisphere is sequential, textual, and analytical. The right hemisphere is simultaneous, contextual, and synthetic. Of course, we enlist both halves of our brains for even the simplest tasks. And the respective traits of the two hemispheres have often been caricatured well beyond what the science actually reveals. But the legitimate scientific differences between the two hemispheres of the brain do yield a **powerful metaphor** for interpreting our present and guiding our future."*

It is difficult to use both sides simultaneously (Stroop)

Using both sides of our brains is not something we do easily or naturally. For example, look at this chart and read out loud the **COLOURS** and not the words that are written:

YELLOW BLUE ORANGE
BLACK RED GREEN
PURPLE YELLOW RED
ORANGE GREEN BLACK
BLUE RED PURPLE
GREEN BLUE ORANGE

Right Brain v. **Left Brain**:

The right side of your brain wants to say the colour, but the left side of your brain insists on reading the word.

Could Brain Preferences Impact Rights-Based Outcomes?

**Rights-based outcomes =
THE LEGAL SYLLOGISM (an algorithm):**



Facts (past & present)
+
Applicable law(s)
=
Outcomes
(«conclusions»)

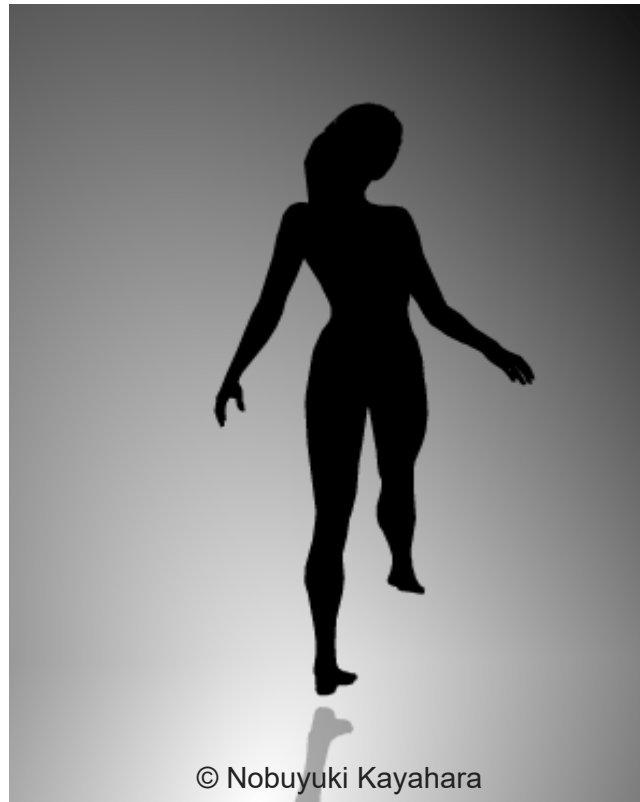
Can neutrals guarantee impartiality?
 “We have to rely only on the objective facts”.
 “We have a ‘sacred duty’ to establish the truth.”

Example: What are "Facts" in this image?

The co-called "Right Brain" vs "Left Brain test" ... do you see the dancer turning clockwise or anti-clockwise? If clockwise, then you may tend to use more of the right side of the brain and vice versa. Most of us would see the dancer turning anti-clockwise though you can try to focus and change the direction; see if you can do it. (This test has since been debunked in these terms.)

"LEFT BRAIN" FUNCTIONS

uses logic
 detail oriented
 facts rule
 words and language
 present and past
 math and science
 can comprehend
 knowing
 acknowledges
 order/pattern perception
 knows object name
 reality based
 forms strategies
 practical
 safe



"RIGHT BRAIN" FUNCTIONS

uses feeling
 "big picture" oriented
 imagination rules
 symbols and images
 present and future
 philosophy & religion
 can "get it" (i.e. meaning)
 believes
 appreciates
 spatial perception
 knows object function
 fantasy based
 presents possibilities
 impetuous
 risk taking

Source: <http://www.news.com.au/dailytelegraph/story/0,22049,22535838-5012895,00.html>

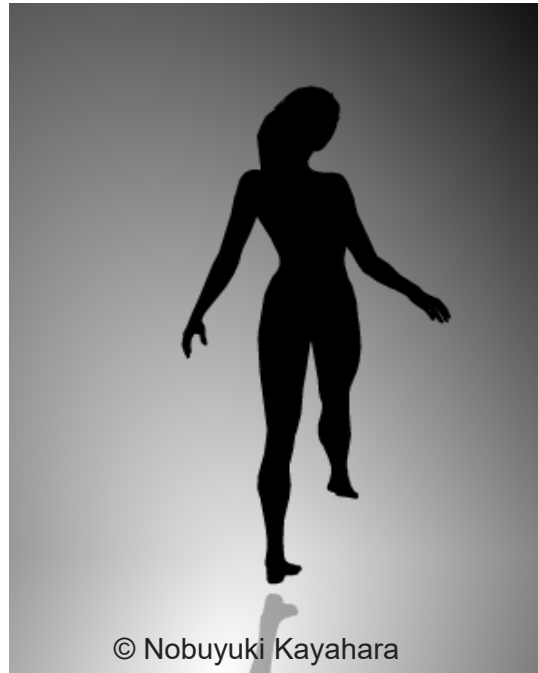
Is this logo infringing? ("clockwise" = v. "anti-clockwise" =)

INFRINGING:

The dancer turns

CLOCKWISE

If we see her as standing
on her **LEFT FOOT**

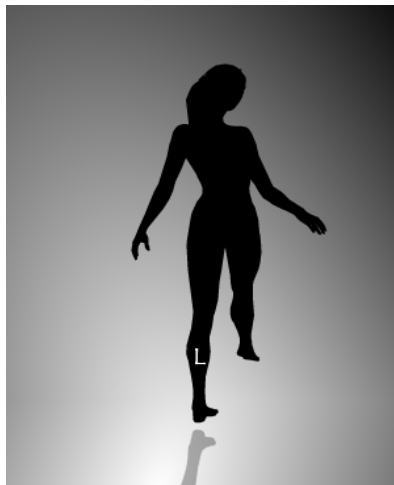


NOT-INFRINGING:

The dancer turns

ANTI-CLOCKWISE

If we see her as standing
on her **RIGHT FOOT**

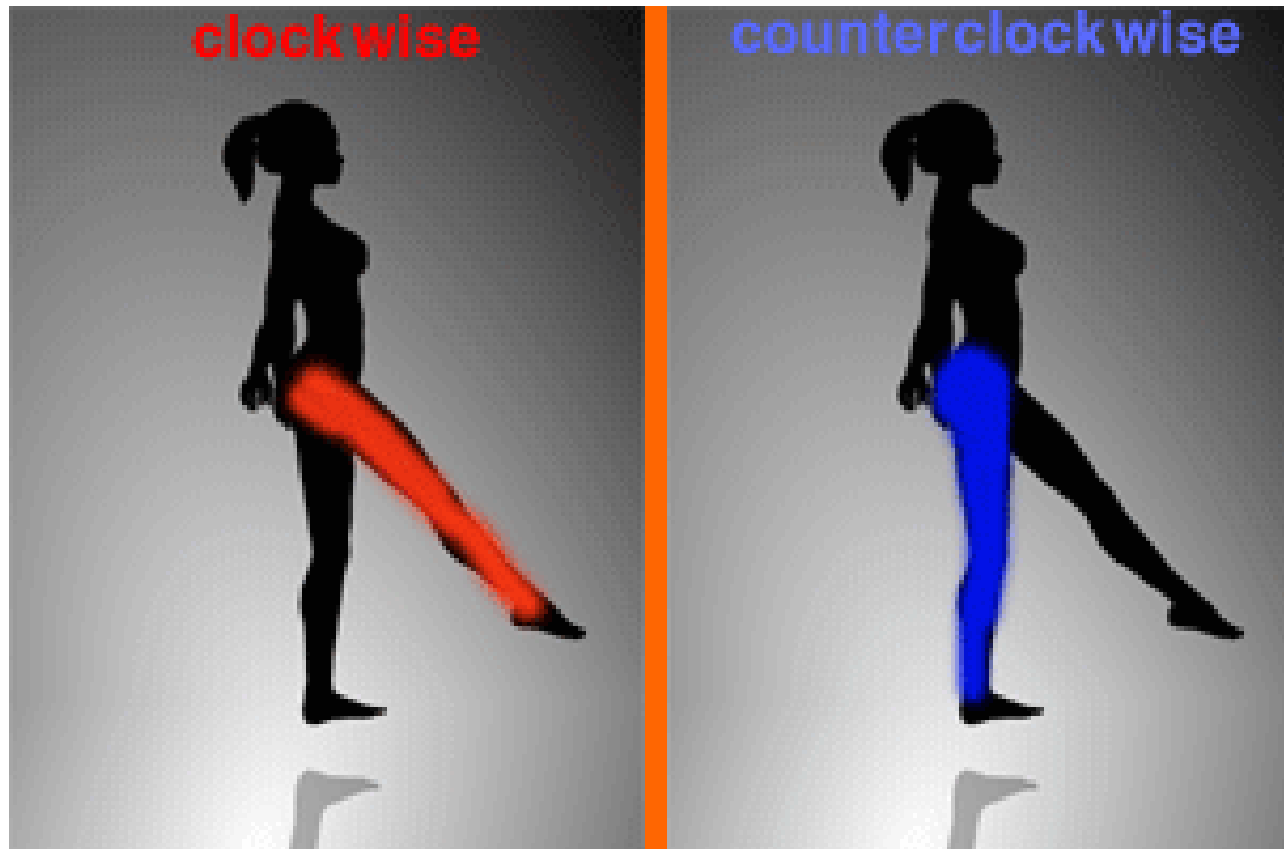


**"We do not see things
as they are. We see
things as we are"**

Anais Nin



Biases: “Civil Law” Culture v. “Common Law” Culture?



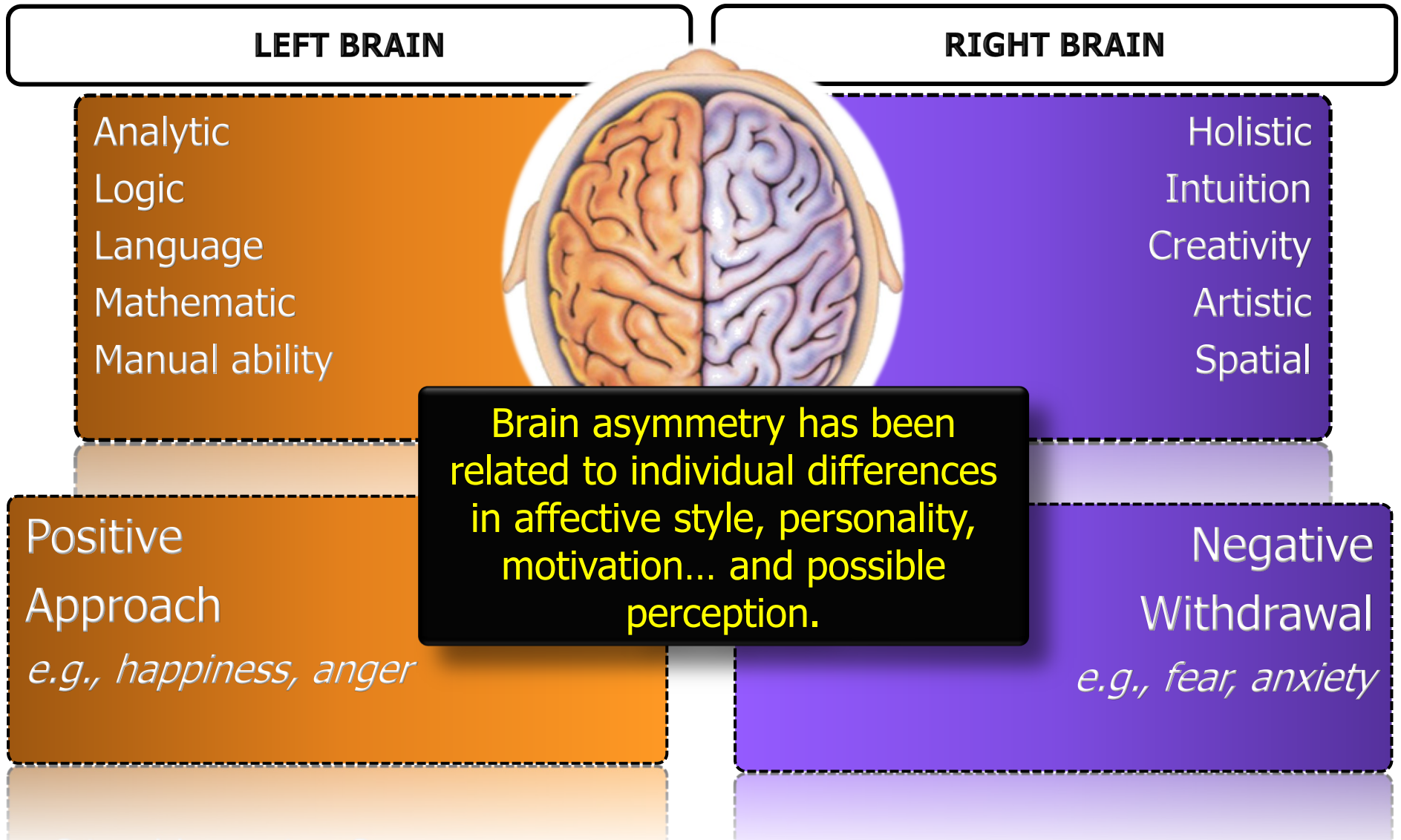
© Nobuyuki Kayahara

Blind spots: What additional information is needed?

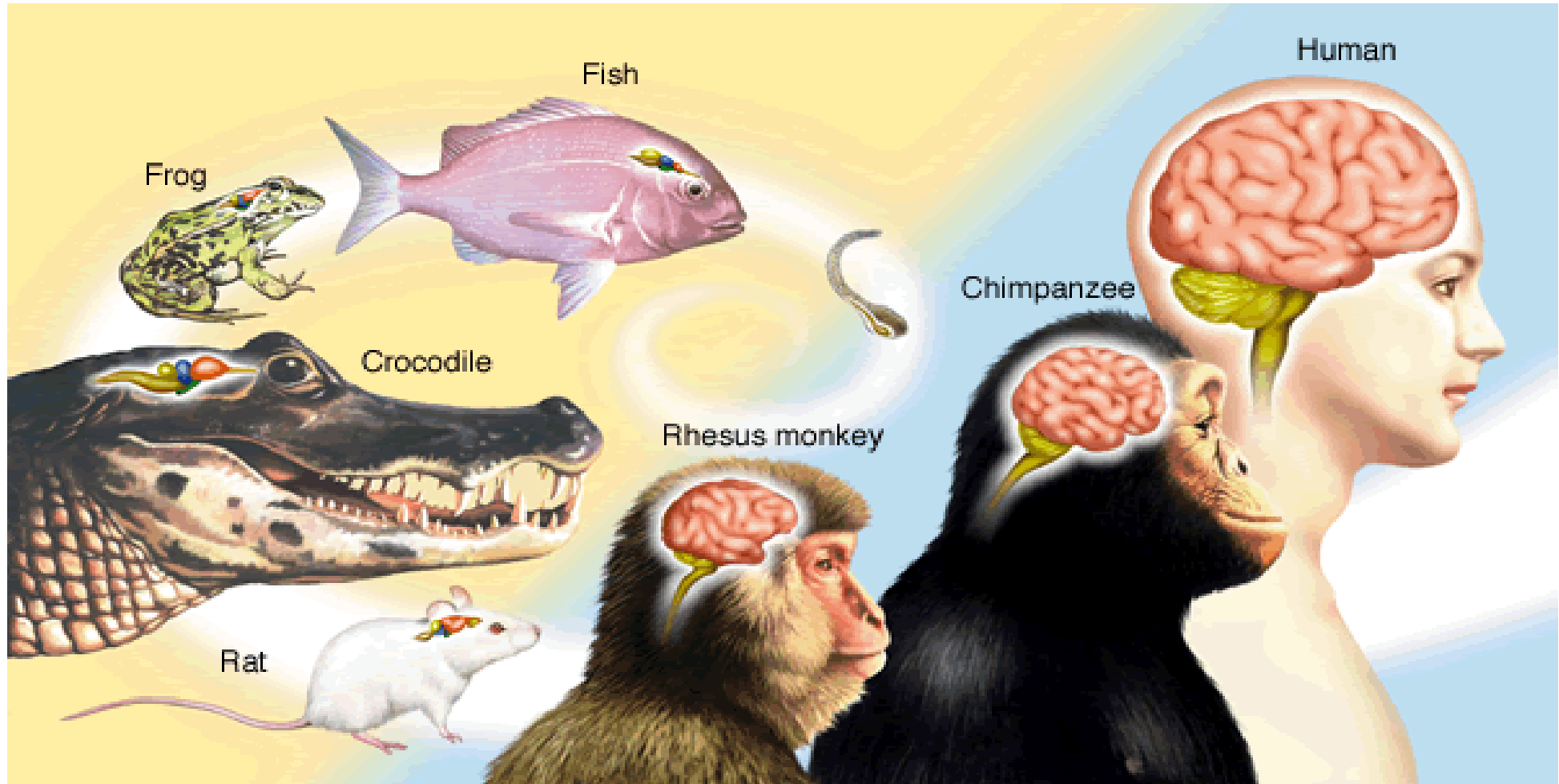


© Nobuyuki Kayahara

Do “Facts” depend on brain lateralization & asymmetry?



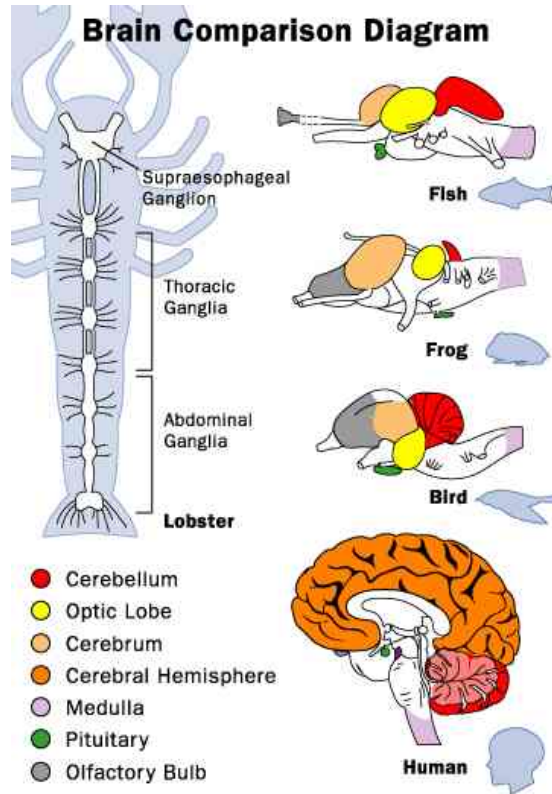
What is really happening? ... The evolution of the brain



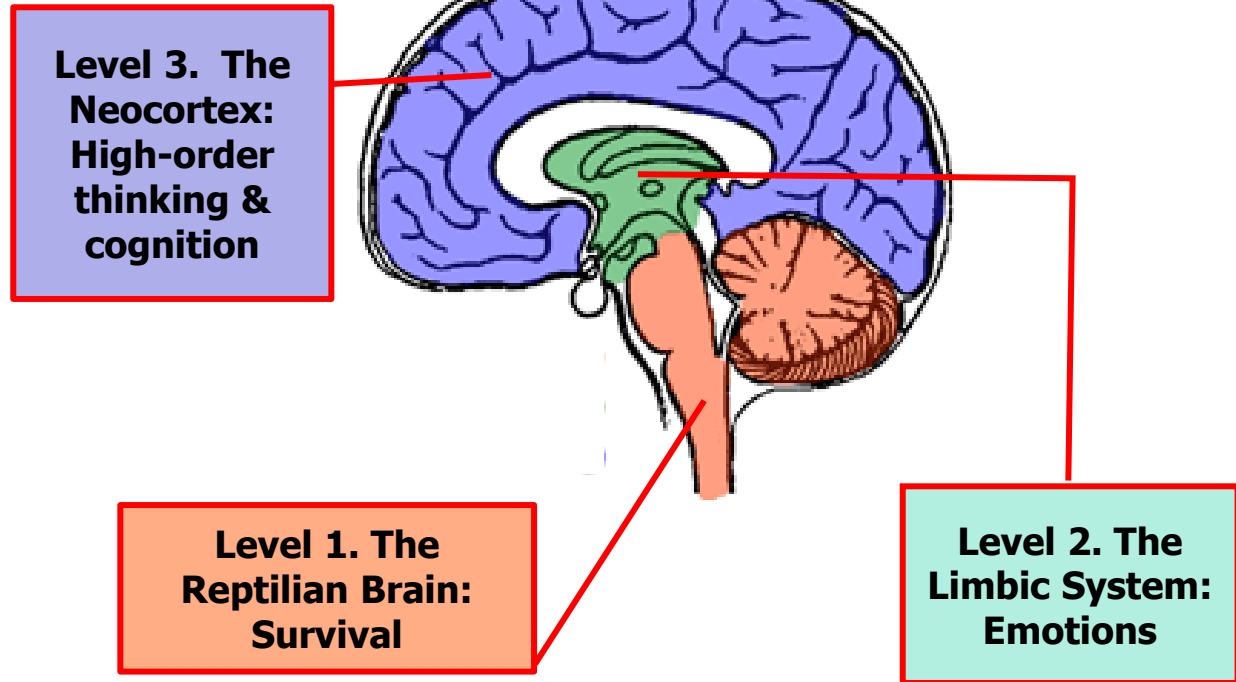
www.brain.riken.jp

The Outcome: A "Triune Brain" = 3 Phases of Evolution

See : Paul D. MacLean http://en.wikipedia.org/wiki/Triune_brain



The Evolution-Designed Brain



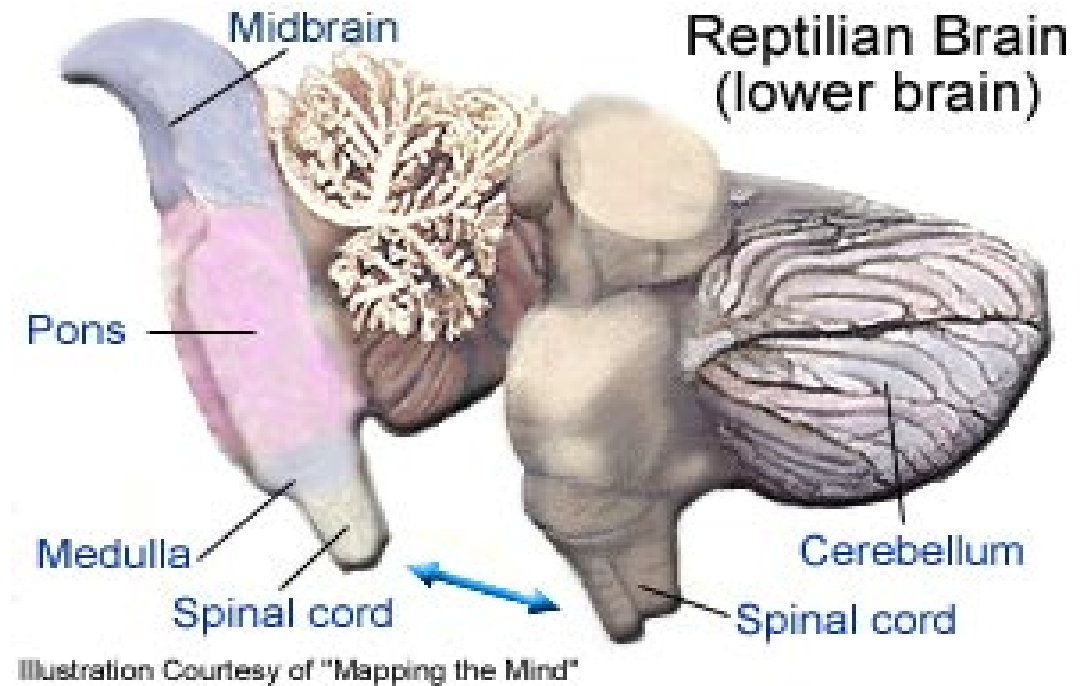
Source:

http://www.solarnavigator.net/biology/biology_images/brain_animal_comparisons.jpg

Source: <http://www.cop.com/info/346edb.gif>

The Reptilian Brain (Survival Reflexes)

The brain stem part of the brain, is the most ancient -- it evolved 500 million years ago and is more like the entire brain of present-day reptiles. For this reason, it is often called the reptilian brain. Various clumps of cells in the brain stem determine the brain's general level of alertness and regulate the vegetative processes of the body such as breathing and heartbeat. **It takes over when fundamental issues of survival are at stake: the fight, flight or freeze reflexes.**



Source: <http://www.brainchannels.com/evolution/physicalbrain.html>

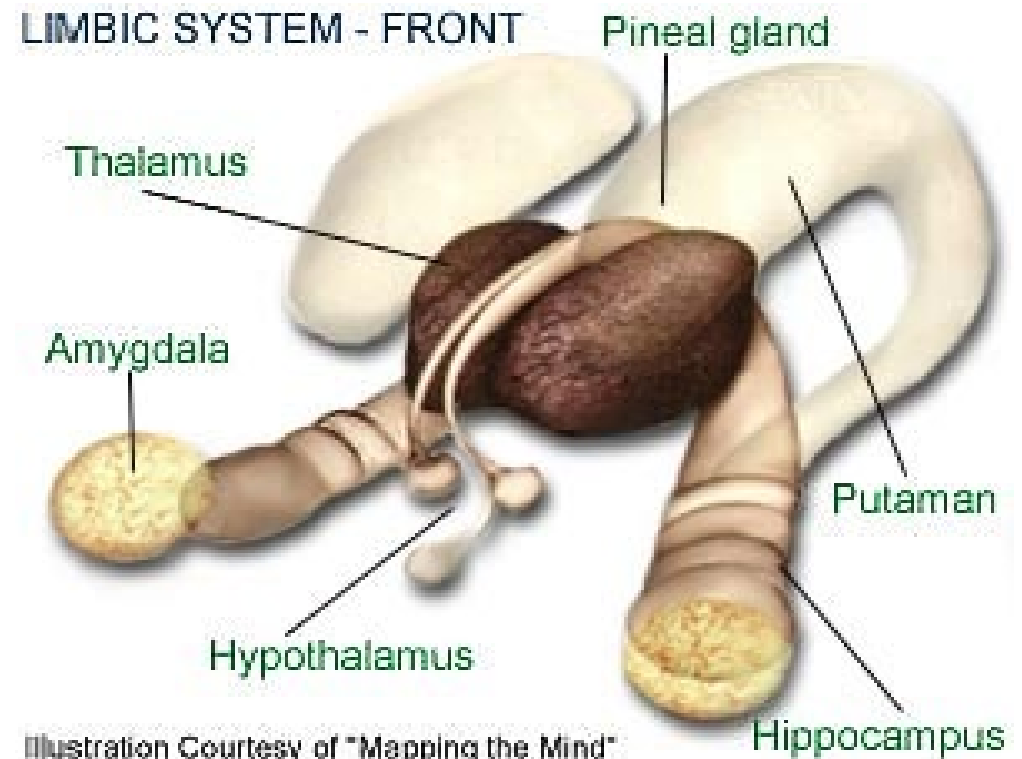
Regions & Functions of the Reptilian Brain

Cerebellum	Its primary role is to maintain the balance and coordination of voluntary movement. The cerebrum initiates movements like walking or dancing, but the cerebellum is required to make these complex motions work correctly. It is also involved in learning movement skills.
Medulla	Helps control bodily functions like respiration, digestion and heart rate.
Midbrain	Aids in many sensory and motor functions.
Pons	Passes and receives information about movement.
Brain Stem	Includes a bundle of nerves connected to the spinal cord, which allows the body and brain to communicate. Fight/Flight/Freeze reflexes are here, as well as sleep/alertness systems.

Source: <http://www.brainchannels.com/evolution/reptiliantable.html>

The Limbic System (Emotions)

The modules that lie beneath the corpus callosum are known as the *limbic system*. This area is older than the cortex in evolutionary terms and is also known as the **mammalian brain** because it is thought to have first emerged in mammals. This part of the brain, and even that below it, is **unconscious**, and yet has a profound affect on our experience because it is densely connected to the conscious cortex above it and constantly feeds information upwards. **Emotions, our most basic cerebral reactions, are generated in the Limbic system along with the many appetites and urges that help us behave in such a way to survive.** For instance, the Amygdala, is the place where fear is registered and generated.



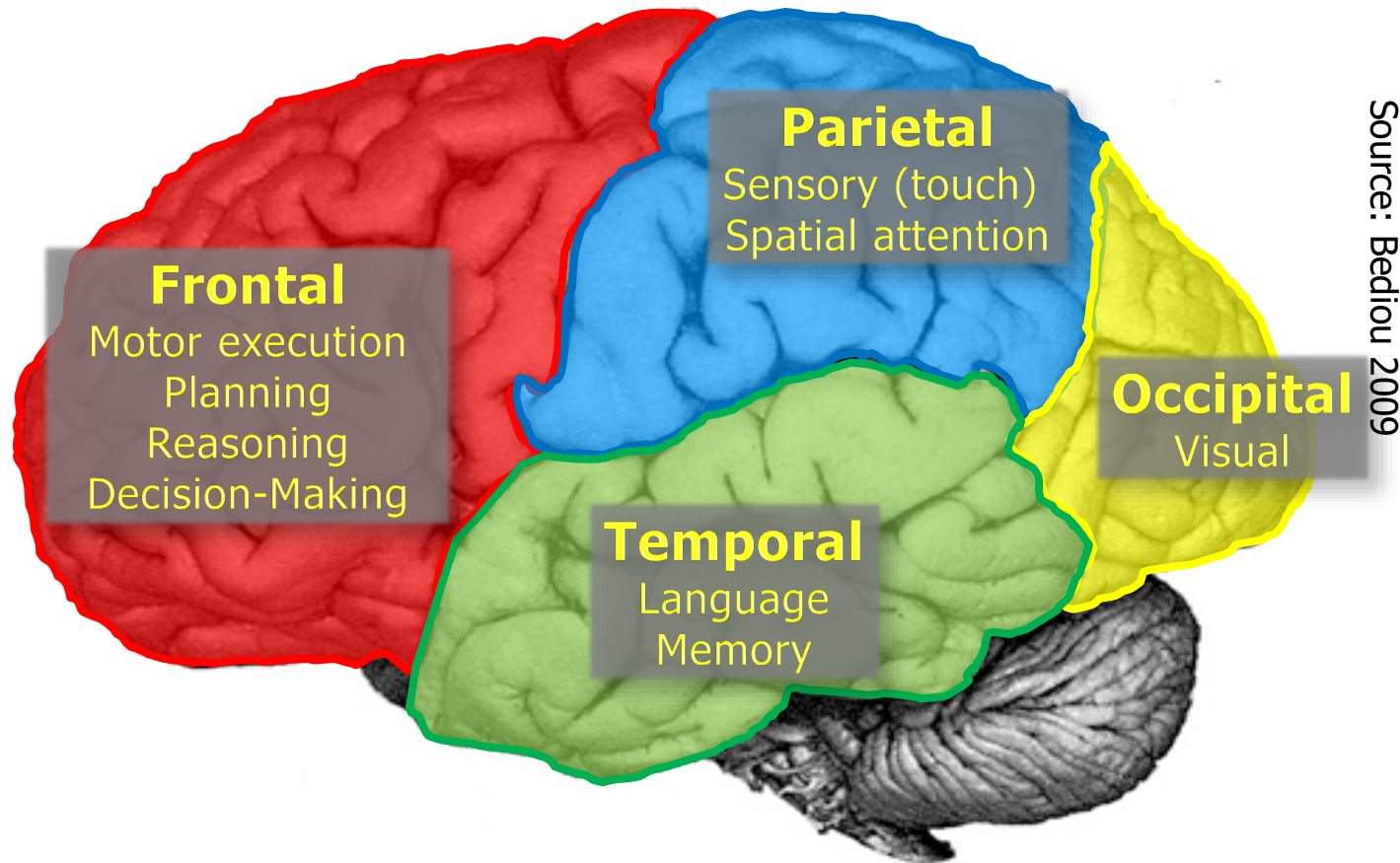
Source: <http://www.brainchannels.com/evolution/physicalbrain.html>

Regions & Functions of the Limbic System

- Thalamus** Acting like a **signal and primary sensory filtering station**, it evaluates incoming sensory signals and re-channels them to appropriate areas of the cortex.
- Amygdala** This is the place where **safety/fear/pleasure** are registered and generated along with the other **negative/primary emotions** of anger and sadness. It is also **a place where unconscious, traumatic memories are stored**.
- Caudate Nucleus** Many instincts -- which are genetically encoded memories, stem from here.
- Hippocampus** Helps to **lay down long term memories** and also retrieves them, particularly those related to a personal nature, as well as finding one's way about. Identifies sensory information worth saving and interprets incoming signals.
- Hypothalamus** A cluster of nuclei, each of which helps to control bodily urges and appetites. **It acts like a bridge between body and brain**. Though it is tiny, it has an enormous effect -- a single dysfunction can create serious problems. The Pituitary Gland is closely tied with the *hypothalamus* -- it produces secretions to help keep the body optimally adapted to its environment.
- Pineal Gland** This is the only single element unduplicated in the brain, without a mirrored partner. Though still much needs to be learned about this mysterious organ, we do know it regulates the function of all the endocrine organs through the hormone melatonin. It has often been referred to as the "third eye" or the bridge from physical to spiritual reality. It is considered by some to be the physical location for psychic phenomena such as mental telepathy. The 17th Century French philosopher Rene Descartes considered the *pineal gland* to be responsible for consciousness and soul.
- Putamen** Procedural memories, like riding a bike are stored here.

Source: <http://www.brainchannels.com/evolution/limbicable.htm> |

The Neocortex/Outer Brain (Cognition)



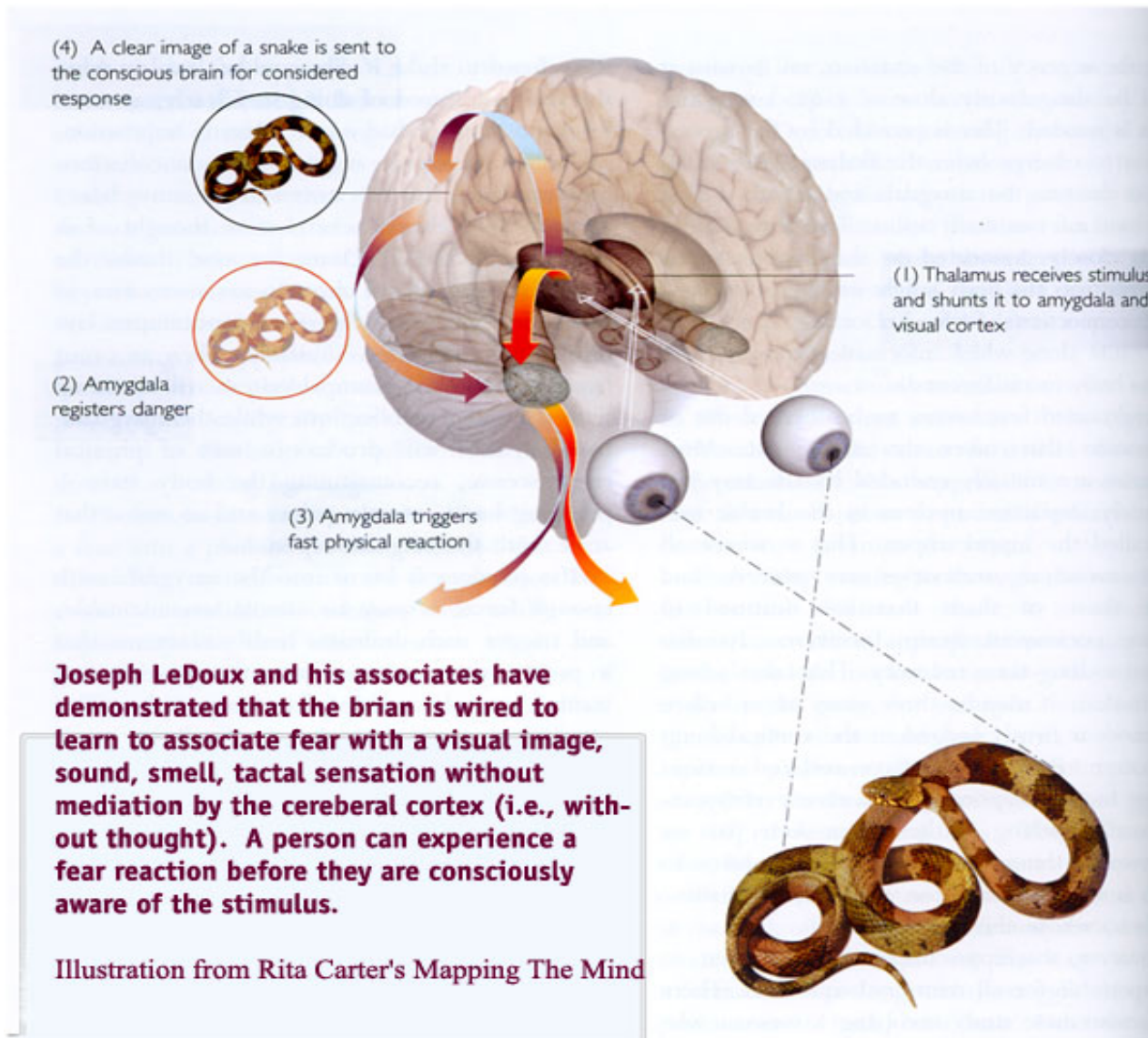
NB: Hemispheric biases: e.g., LHS = Externally-oriented / RHS = Internally oriented

Regions & Functions of the Outer Brain/Neocortex

Frontal Lobe	Deals with the most integrated brain functions: thinking , conceptualizing and planning . It also plays a major part in the conscious appreciation of emotion
Parietal Lobe	Functions connected with movement, orientation, calculation and certain types of recognition.
Temporal Lobe	Deals with sound, speech comprehension (usually the left brain only) and some aspects of memory.
Occipital Lobe	Made up entirely of visual processing areas.
Motor Cortex	The frontal <i>motor cortex</i> primarily controls the movement of the hands and face.
Corpus Callosum	A thick band of axon fibers, 80 million or so, which connect the brain cells in left hemisphere to those in the right hemisphere. The two sides keep up a continuous intimate conversation via this neural bridge that produces a seamless perception of the world, and a single stream of consciousness. There is a difference in size between men and women -- women's are relatively larger.

Source: <http://www.brainchannels.com/evolution/outerbrainable.html>

How the 3 regions of the brain evolved to data



Source
http://www.zoology.ubc.ca/~auld/bio456/lecture/s/stress_figs/Amygdala1.jpg

The Amygdala as a Rapid Relevance Detector

© Freund & Pettman, U.K.

Reviews in the Neurosciences, 14, 303-316 (2003)

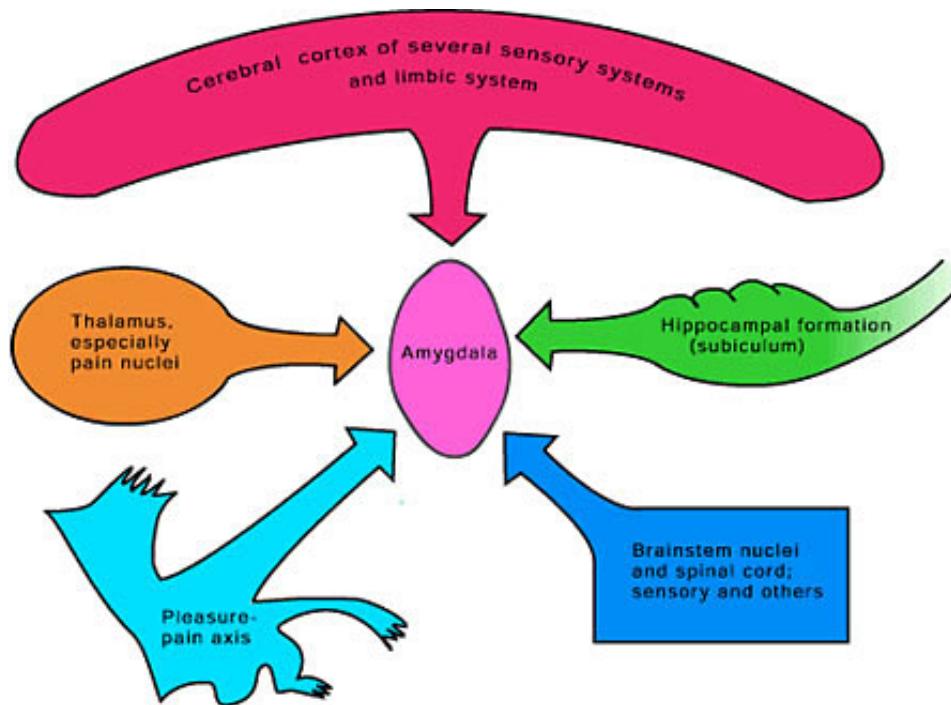
The Human Amygdala: An Evolved System for Relevance Detection

David Sander¹, Jordan Grafman² and Tiziana Zalla³

¹Geneva Emotion Research Group, Psychology Section, University of Geneva, Geneva, Switzerland,

²Cognitive Neuroscience Section, NINDS, National Institutes of Health, Bethesda, MD, USA and

³Institut des Sciences Cognitives, Bron, France



SYNOPSIS

Evidence from pioneering animal research has suggested that the amygdala is involved in the processing of aversive stimuli, particularly fear-related information. Fear is central in the evolution of the mammalian brain: it is automatically and rapidly elicited by potentially dangerous and deadly events. The view that the amygdala shares the main characteristics of modular systems, e.g. domain specificity, automaticity, and cognitive impenetrability, has become popular in neuroscience. Because of its computational properties, it has been proposed to implement a rapid-response 'fear module'. In this article, we review recent patient and neuroimaging data of the human brain and argue that the fundamental criteria for the amygdala to be a modular system are not met. We propose a different computational view and suggest the notion of a specific involvement of the human amygdala in the appraisal of relevant events that include, but are not restricted to, fear-related stimuli. Considering the amygdala as a 'relevance detector' would integrate the 'fear module' hypothesis with the concept of an evolved neural system devoted to the processing of a broader category of biologically relevant stimuli. In primates, socially relevant events appear to have become, through evolution, the dominant elements of the amygdala's domain of specificity.

KEY WORDS

social cognition, emotion, appraisal, evolutionary psychology, temporal lobe, human brain

PURPOSE AND OVERVIEW

The study of the functions of the amygdala has exploded during the so-called 'decade of the brain'. During this period many new anatomical and functional findings about the amygdala have been obtained (see /10,11/). A marker of this interest is that numerous reviews on the amygdala have been published; these articles include reviews highlighting the amygdala's contributions to emotion /3,27,73/, vigilance-emotion relationships /34,100/, memory /46,63,76/, attention /51/, fear conditioning /26/, reward-based learning /18/ and social cognition /2,4,13/. In the present review, we challenge one of the major features of the current theories of the human amygdala by proposing a different hypothesis about its computational profile and domain of specificity. In order to do so, we adopt a perspective that takes into account data from cognitive neuropsychology and functional brain imaging in humans. After a short presentation of the dual route architecture in which the amygdala is involved, we show that the definition of the amygdala's specific domain of processing is highly controversial and propose a perspective that may help to resolve this debate.

A DUAL ROUTE ARCHITECTURE TO THE AMYGDALA

Pioneering animal studies have provided an important contribution to the understanding of the anatomical and functional structure of the amygdala. The primate amygdala is an almond-shaped

Source:
<http://www.neilslade.com/gifs/AmygdalaInputs.jpg>

Accepted: 8 May, 2003

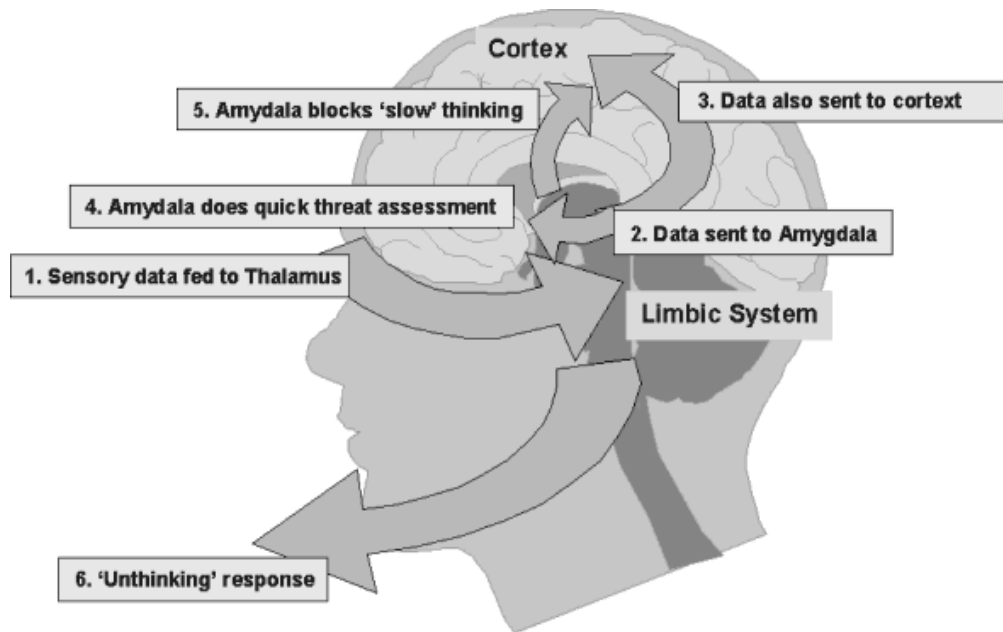
Reprint address:
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 69675 Bron cedex, France
 e-mail: zalla@isc.cnrs.fr

VOLUME 14, NO. 4, 2003

303

A summary of how the 3 areas of the brain may interact

Six steps to unthinking response



1. Sensory data fed to thalamus

All sensory data (except the sense of smell) is sent by the body first to the Thalamus, which acts like a switchboard, sending it to the relevant part of the brain.

2. Data sent to amygdala

The thalamus sends the data both to the relevant part of the cortex and also to a small part of the mid-brain called the amygdala.

3. Data also sent to cortex

When the information is sent to the cortex, we, of course, think about it. The problem is, that sometimes there is no time to think -- in fact too much thinking can sometimes leave you dead!

4. Amygdala does quick threat assessment

The senses are compared in the amygdala with stored fear responses. If any of these are triggered, then the amygdala has to act quickly.

5. Amygdala blocks 'slow' thinking

If the fear response is triggered, then the amygdala floods the cortex with chemicals to stop it taking over.

6. Unthinking response

The result is that we act without conscious thought. We jump out of the way of a falling branch or dive into the river to save a child.

So what?

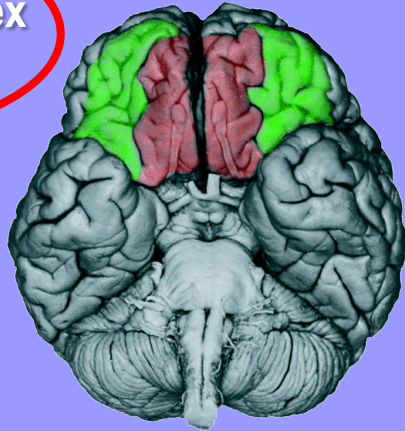
This is the level at which all perception may operate. Automatic associations are made, of safety or pleasure with a given input. Based on that, we assume things and are willing to trust or fear them instinctively. **We need to factor this into conflict resolution processes.**

Source:

<http://changingminds.org/images/amygdala.gif>

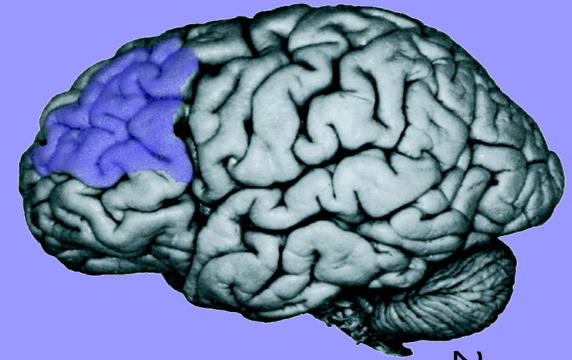
Key brain structures involved in conflict (OFC v. Amygdala.)

Orbitofrontal Cortex
Decision utility



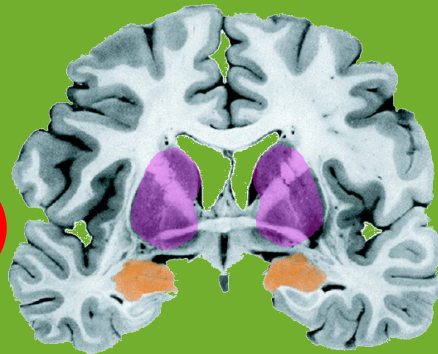
(both can block amygdala via ACC)

Dorsolateral Prefrontal Cortex
Working memory & executive functions (planning, control, Inhibition...)



Cortical brain (CONTROL)

Ventral Striatum
Reward processing & prediction



Amygdala
Relevance detection

(Amygdala v. ACC => Aggression v. Withdrawal)

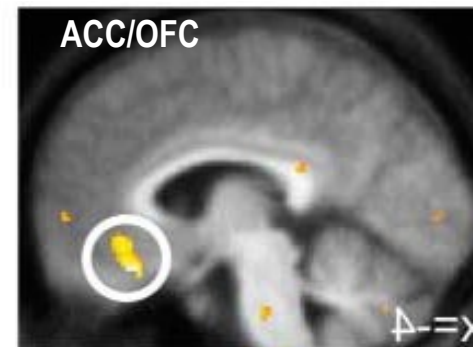
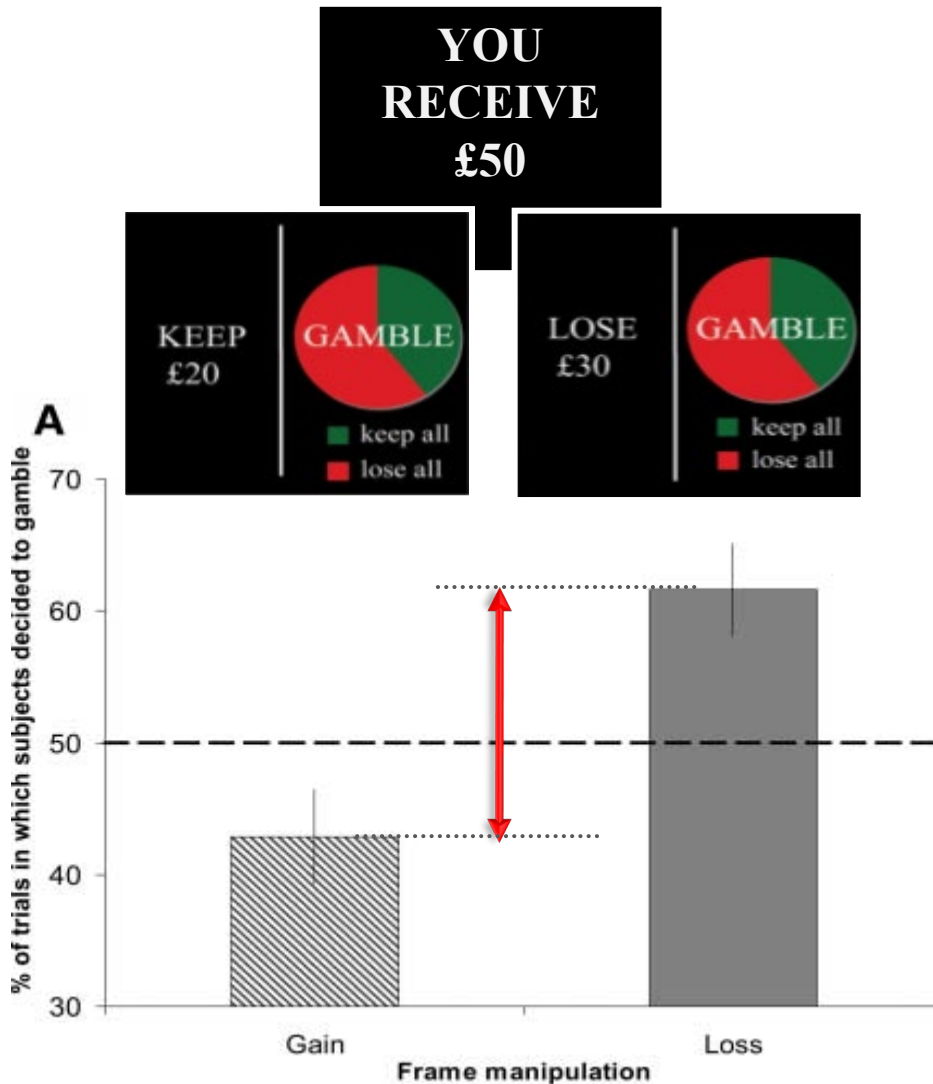
Anterior Cingulate Cortex (ACC)
Adaptive behaviour (performance and conflict detection and monitoring)



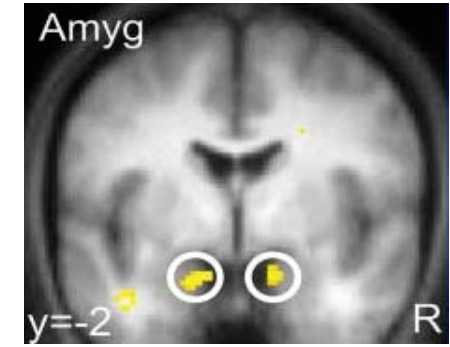
Limbic brain (EMOTION)

Visualizing impact of these 2 regions in decision-making

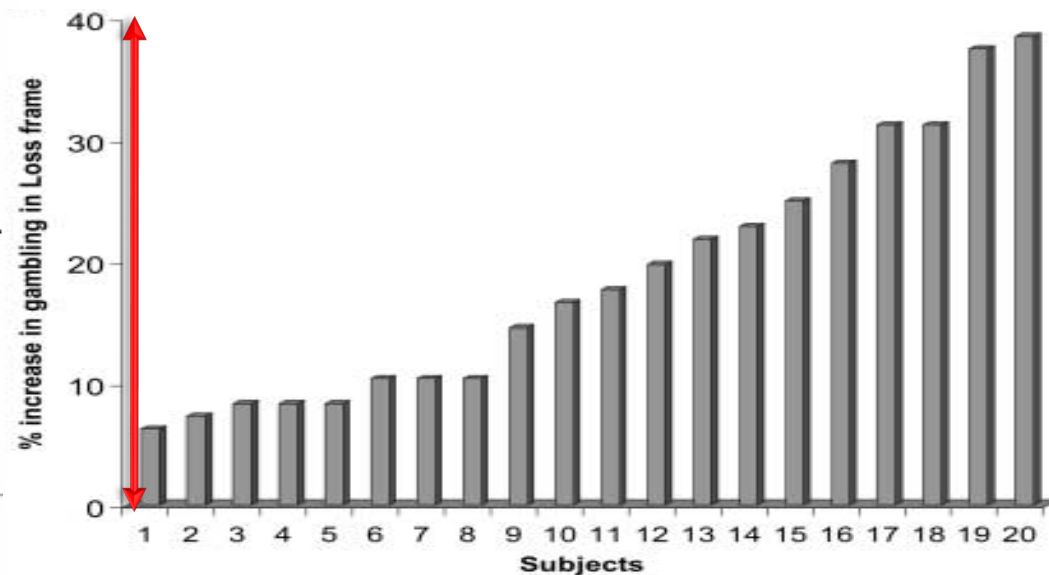
De Martino et al. 2006



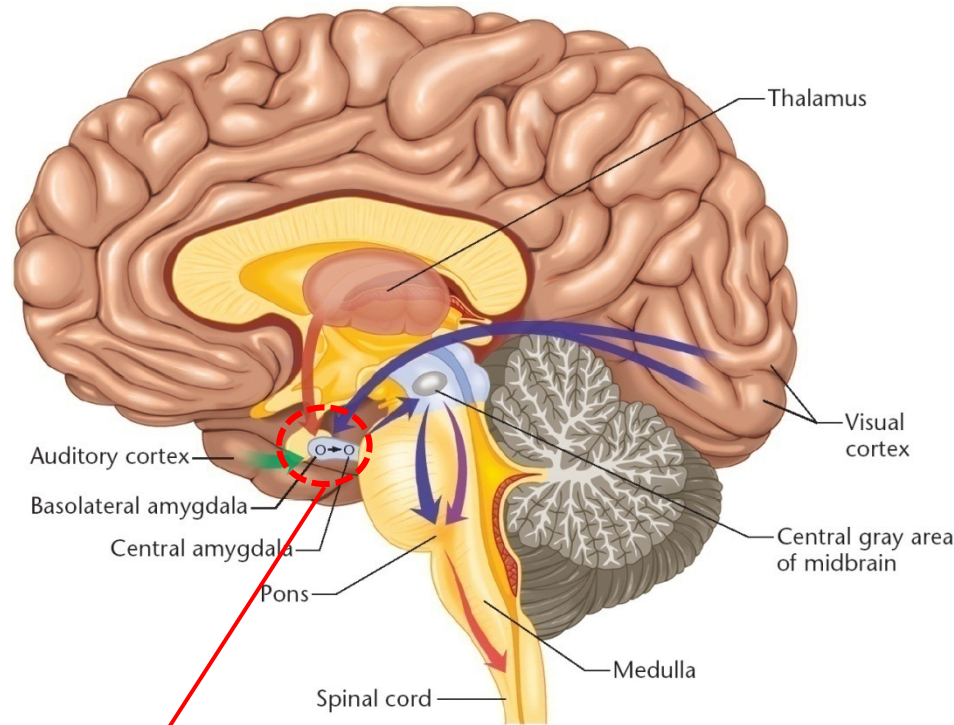
"Safe": Frontal Cortex is Active



"Fear": Amygdala are Active



Conclusion: Emotions are the filter of all perception



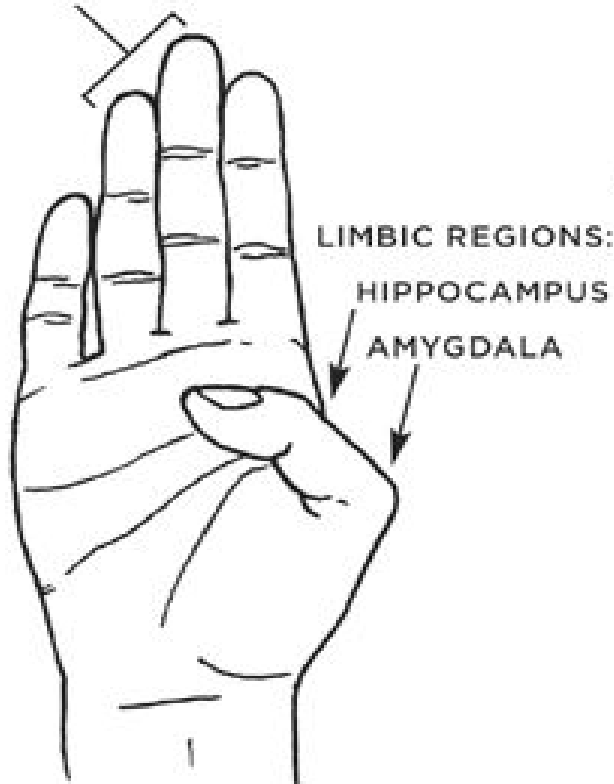
The amygdala acts as a rapid relevance detector that switches between “reptilian” and “cortical” thinking.

**Perception is 100% emotional (whatever we would like to believe).
Emotions reflect our basic needs and interests.**

Source: <http://cti.itc.virginia.edu/~psyc220/kalat/JK379.fig12.13.amygdala.con.jpg>

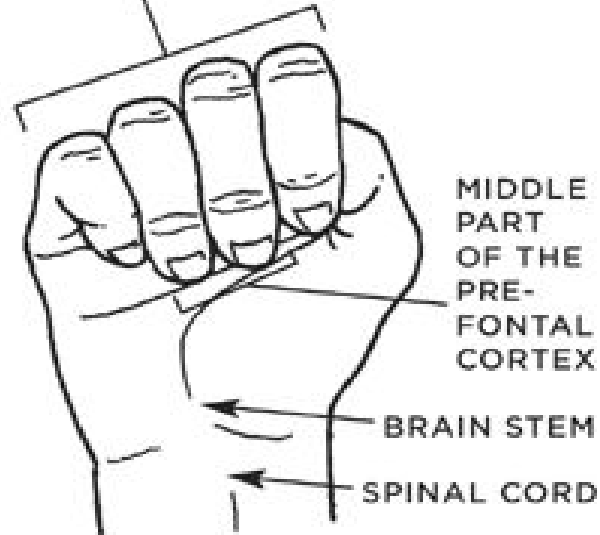
Aide-memoire: The limbic system as a pivotal centre

MIDDLE PREFRONTAL CORTEX



Place your thumb in the middle of your palm as in this figure.

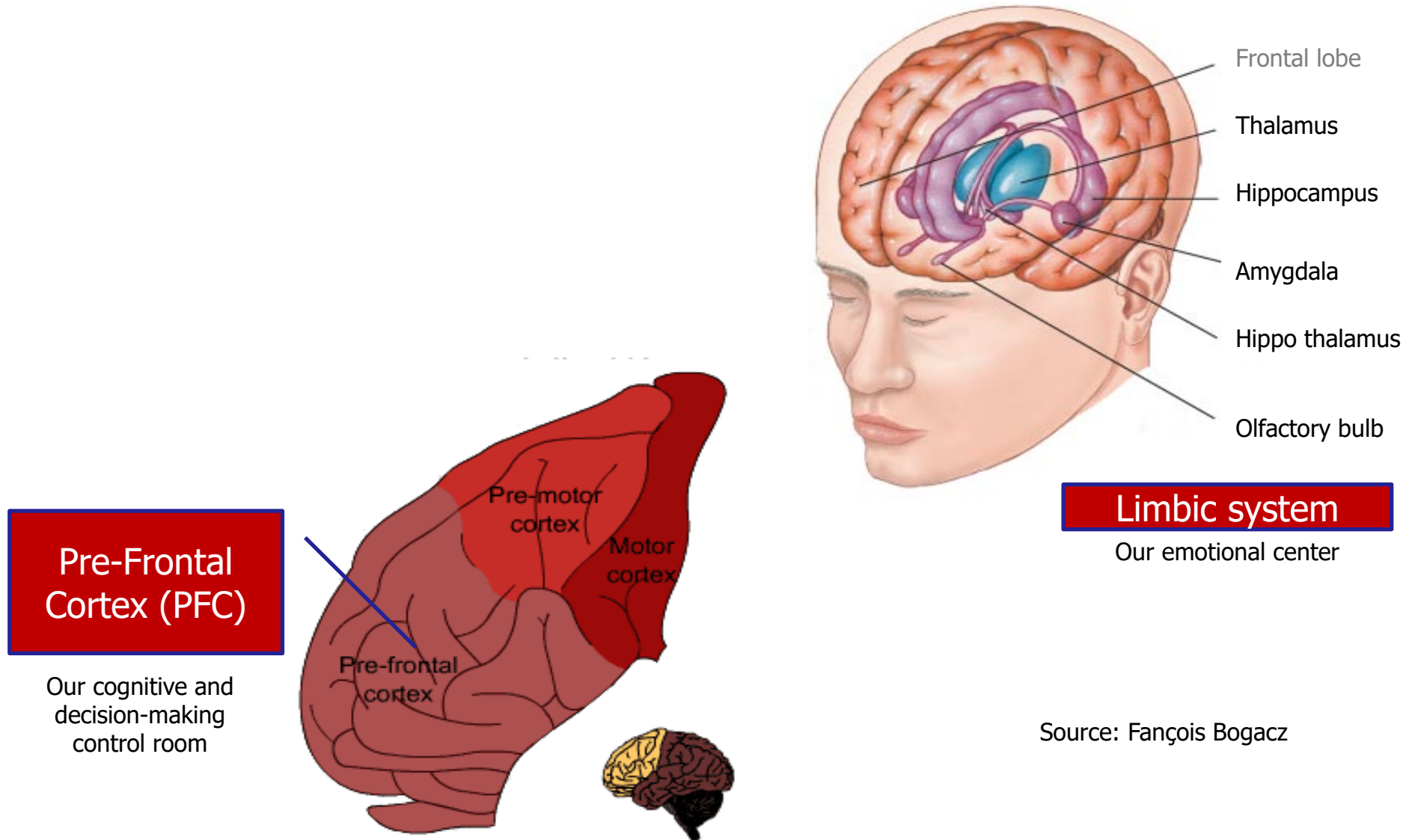
CEREBRAL CORTEX



Now fold your fingers over your thumb as the cortex is folded over the limbic areas of the brain.

From François Bogacz; Source: « Mindsight – The new science of personal transformation » by Dan Siegel – Bantam – January 2010

Meet the protagonists: Impact of how they collaborate ...



Pain & Reward

Our biologic survival mechanism, governed by memories of stimuli, makes us **unconsciously (i.e., automatically):**

- **Avoid** pain and danger = **“Away” reflex**
- **Seek** rewards = **“Toward” reflex**

Source: François Bogacz

Danger is more dominant than reward

**Threat/
Pain**

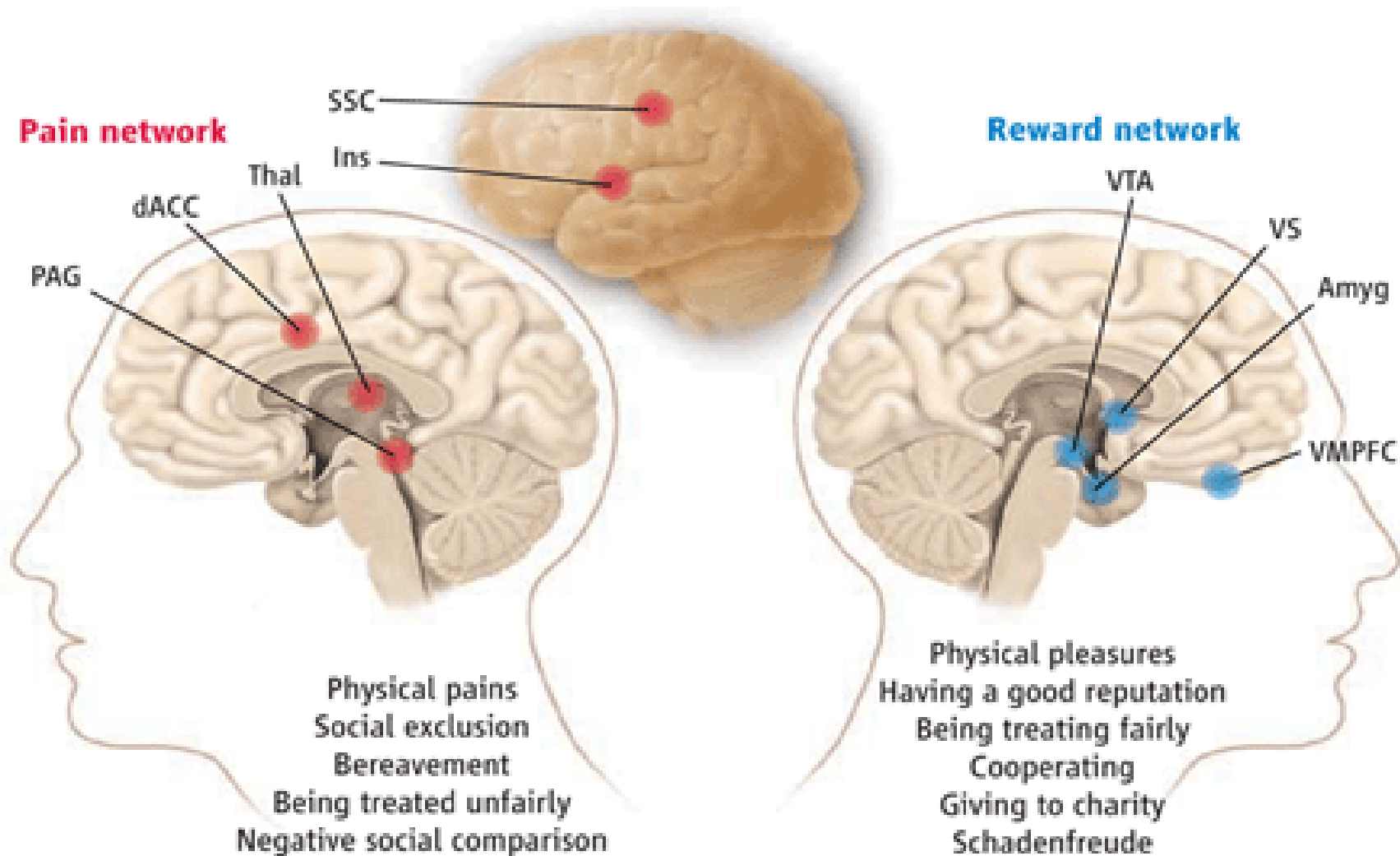
**The Mediator's Challenge:
How to systematically minimize perception of danger &
maximize perception of reward during mediation?**

Reward

- Faster acting
 - Stronger
 - Longer lasting
 - Adversarial capacities up
 - Cognitive capacities slowed down
 - More likely
- Slower acting
 - Milder
 - Shorter
 - Cognitive capacities up (i.e., pre-frontal cortex decision making)
 - Less likely

Source: Dr Dan Radecki – Neuroleadership Institute

“Social” stimuli are as powerful as physical ones

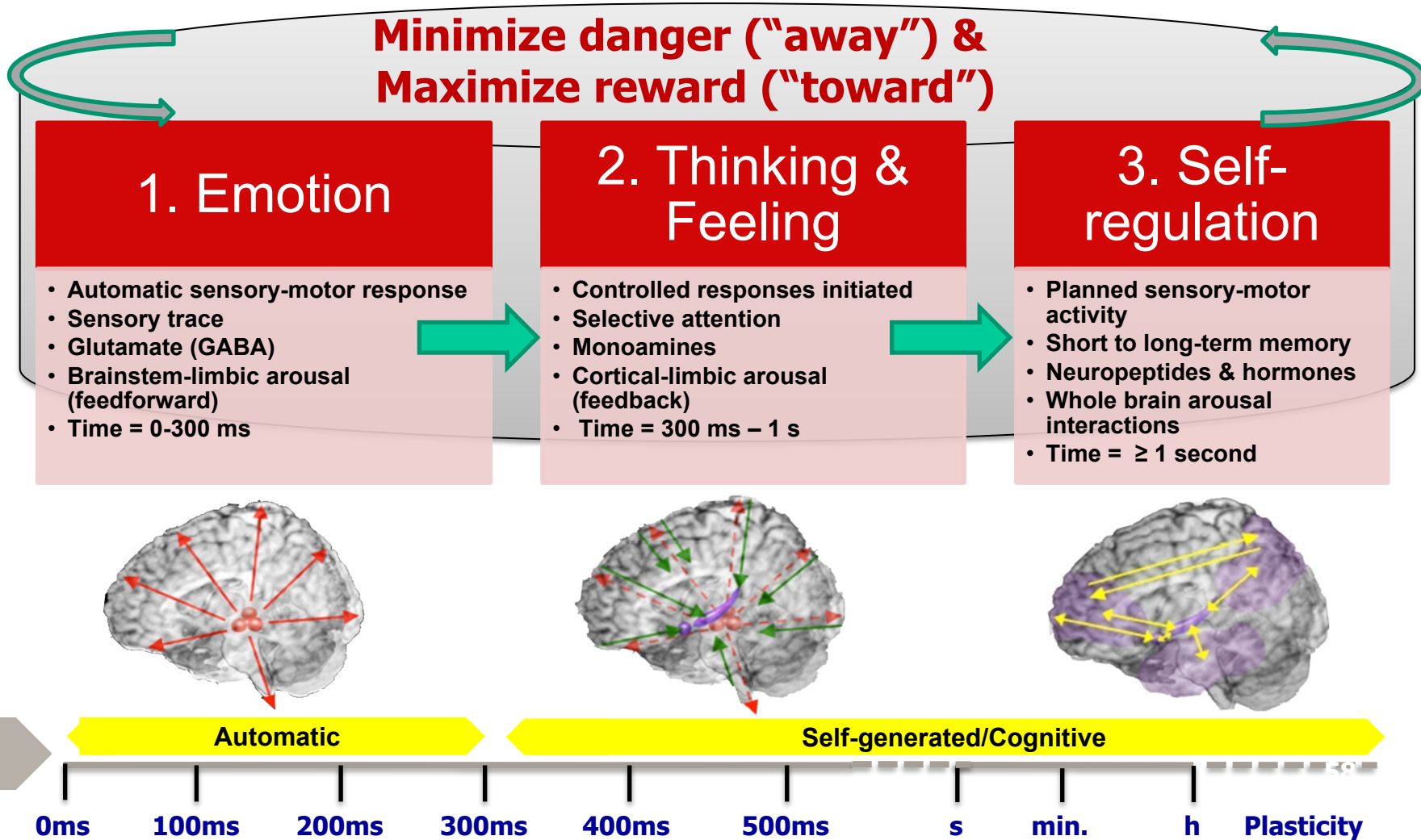


From François Bogacz; *Source: Lieberman and Eisenberger, 2009. Takahashi et al. Science 2009*

Brain response times: We operate cognitively at stage 3

Source: Francois Bogacz, Convergente

Based on: *NeuroLeadership and Integrative Neuroscience: "it's about Validation, stupid!"* - Dr Evian Gordon - 2008



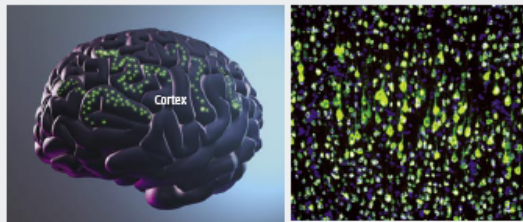
The Debate: Regionalisation v. Neuronal Assemblies

CONSCIOUSNESS EXPLAINED

What happens in your brain when you see a dog, hear a voice, suddenly feel sad or have any other subjective experience?

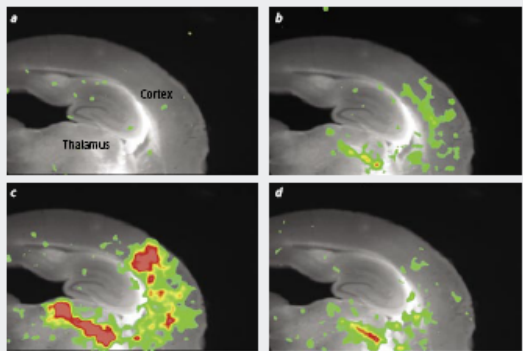
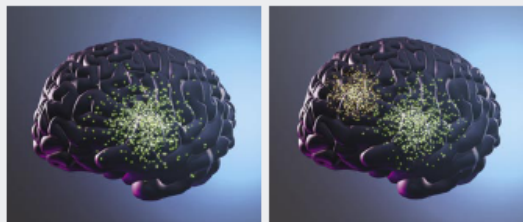
KOCH'S MODEL

A coalition of pyramidal neurons linking the back and front of the cortex fires in a unique way. Different coalitions activate to represent different stimuli from the senses (left). In a mouse cortex (right) these pyramidal cells (green) lie in brain layer 5, surrounded by nonneuronal cells (blue).



GREENFIELD'S MODEL

Neurons across the brain fire in synchrony (green) and prevail until a second stimulus prompts a different assembly to arise (orange). Various assemblies coalesce and disband moment to moment, while incorporating feedback from the body. In a rat brain (bottom), an assembly in the cortex forms (a, b), peaks (c), then decays (d) within 0.35 second after the thalamus is electrically stimulated.



Why does an alarm clock induce consciousness in a sleeping (unconscious) person?

Koch's view: Neurons in a region of the brain stem called the locus coeruleus respond to a sudden, large input from the auditory nerve. They spring into action, widely broadcasting a chemical signal to the thalamus and the cerebral cortex. Other neurons release the neurotransmitter acetylcholine throughout the brain. The net effect is that the cerebral cortex and its satellite structures become aroused. Once that occurs, a widespread but tightly interconnected grouping of neurons in the auditory cortex, and its counterparts in the front of the brain and in the medial temporal lobes that support planning and memory, establishes a stable coalition using recurrent feedback. This activity takes only a fraction of a second and causes you to become conscious of the alarm.

Greenfield's view: Any strong sensory stimulus, such as a bright light, will induce consciousness, so no one particular area of the brain can be responsible for waking you up. The alarm clock prompts consciousness not because of the quality of the stimulus (in this case, auditory) but because of its quantity (loudness). Transient neuronal assemblies—many neurons acting in concert—correlate with varying degrees of consciousness: the size of an assembly from one moment to the next is determined by how readily neurons can be corralled into transient synchrony. One key factor is the strength of sensory stimulation, the effects of which are akin to a stone thrown in a pond. The larger the stone, the more extensive the ripples on the water. The louder the alarm (or brighter the light), the more likely it will be to recruit an extensive assembly of neurons, and the more extensive the assembly, the more likely that you will be awakened.

“Neuronal assemblies do not “create” consciousness but rather are indices of degrees of consciousness. Because an assembly’s size and the corresponding degree of consciousness result from a variety of physiological factors—such as degree of connectivity, strength of stimuli and competition from other assemblies—each factor could eventually be manipulated experimentally. The assembly model’s ability to generate falsifiable hypotheses *and* account for the diverse range of phenomena related to consciousness surely makes it particularly powerful.” Prof. Susan Greenfield.

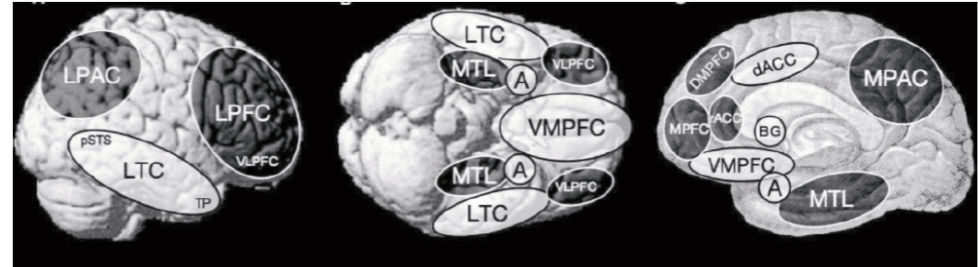
Source: *How does Consciousness Happen?*
A debate between Prof. Christof Koch & Prof. Susan Greenfield.

SCIENTIFIC AMERICAN, Oct. 2007, 76-83

Regionalisation or Assemblies: The X and C Systems

Two systems coexist to screen new behavioural data and assess the “other person”

- “X-System” = 1st gear
 - Reflexive, in charge of **perception**
 - Performs rapid pattern-matching operations on data to check if **consistent** with beliefs/autobiographical memory
 - “Binary” thinking
- “C-System” = 2nd gear
 - Reflective, in charge of **thought**
 - Uses intentional memory
 - Complex thinking

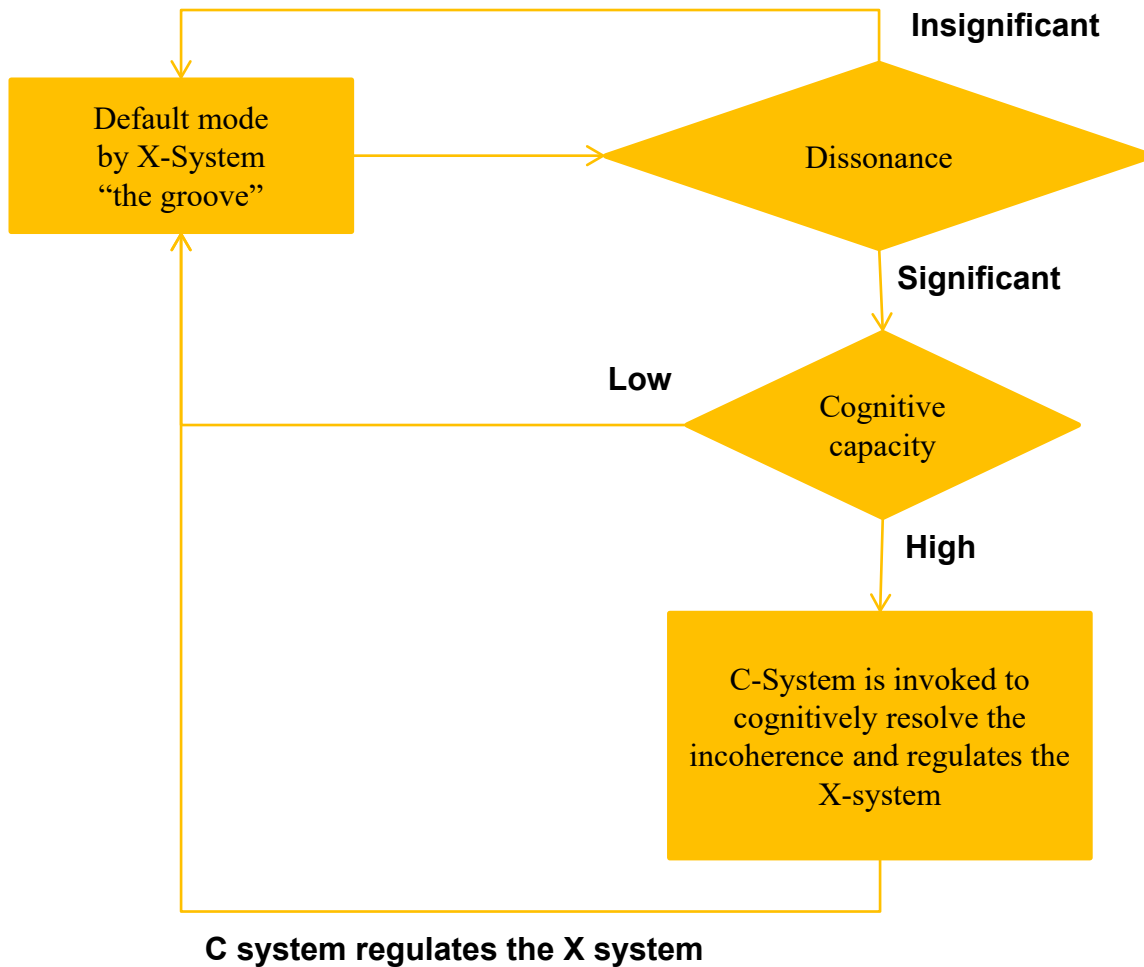


X-System (automatic)	C-System (controlled)
Ventromedial Prefrontal Cortex (VMPFC)	Lateral Prefrontal Cortex (LPFC)
Basal Ganglia (BG)	Medial Prefrontal Cortex (MPFC)
Amygdala (A)	Dorsomedial Prefrontal Cortex (DMPFC)
Dorsal Anterior Cingulate (dACC)	Medial Temporal Lobe (MTL)
Lateral Temporal Cortex (LTC)	Rostral Anterior Cingulate (rACC)
	Lateral Parietal Cortex (LPAC)
	Medial Parietal Cortex (MPAC)

We tend to operate in two gears and mainly coast along in 1st gear (our X-system). Using 2nd gear (C-system) is often preferable. A strong arousal may inhibit C system/2nd gear decision-making.

From F. Bogacz; Based on Lieberman et al.

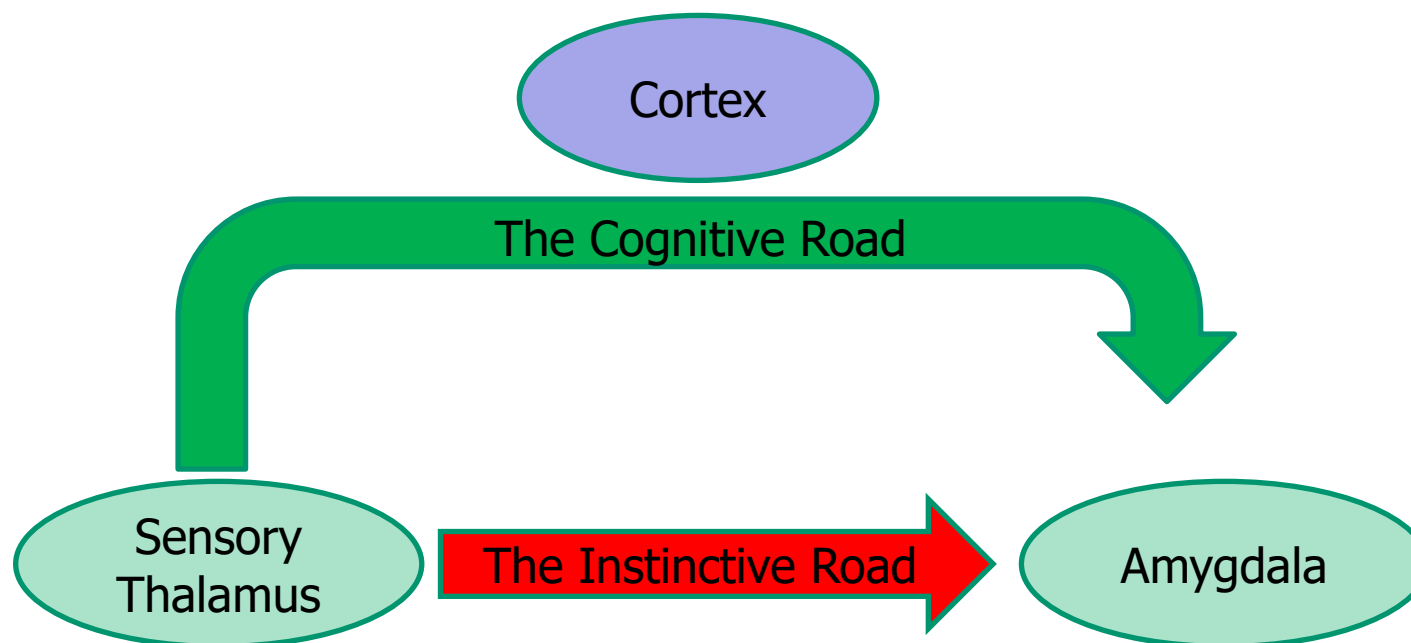
When does the brain perceive in 2nd gear?



Source: Lieberman et al.

- Tendency not to think cognitively but to react
- Too much pre-existing cortical load reduces the capacity to deal with dissonances with the C-system
- In a “towards” mode, the C-system does a much better job in regulating the X-system
- It helps to recognize/ reinforce good behavioral surprises to activate the C-system (increases significance)
- Provide time/space for PFC to have high potential capacity

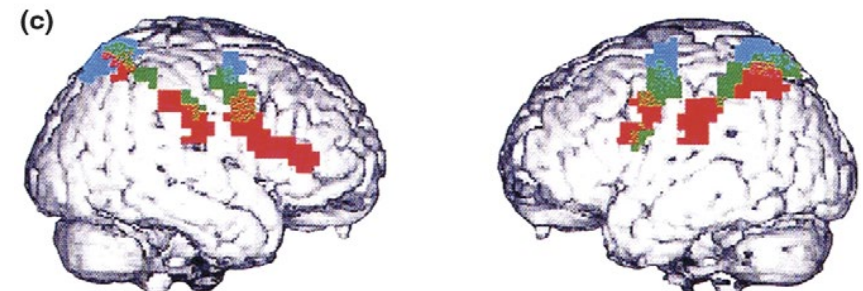
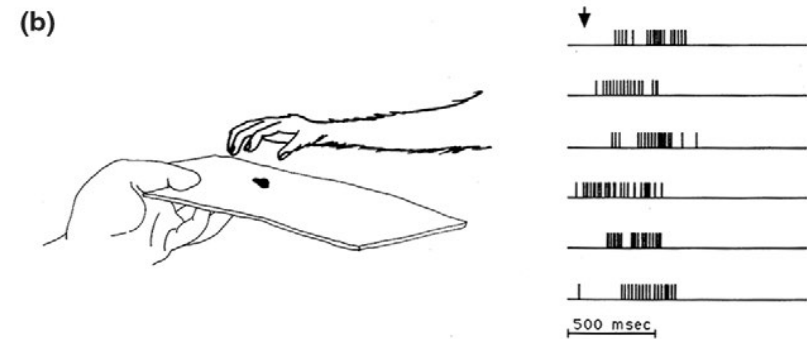
The advantage of “harnessing” emotions



- Emotions are gateways to a person’s most basic needs.
- They can be used to promote cognitive awareness of what may be really driving the conflict.
- When emotions are appreciated cognitively, the “away” reflex can be abated.

Mirror Neurons and Simulation Theory

- Activated when executing, observing and imagining a movement
- Role in social cognition (e.g., emotion processing, imitation, contagion, perspective-taking, empathy...)

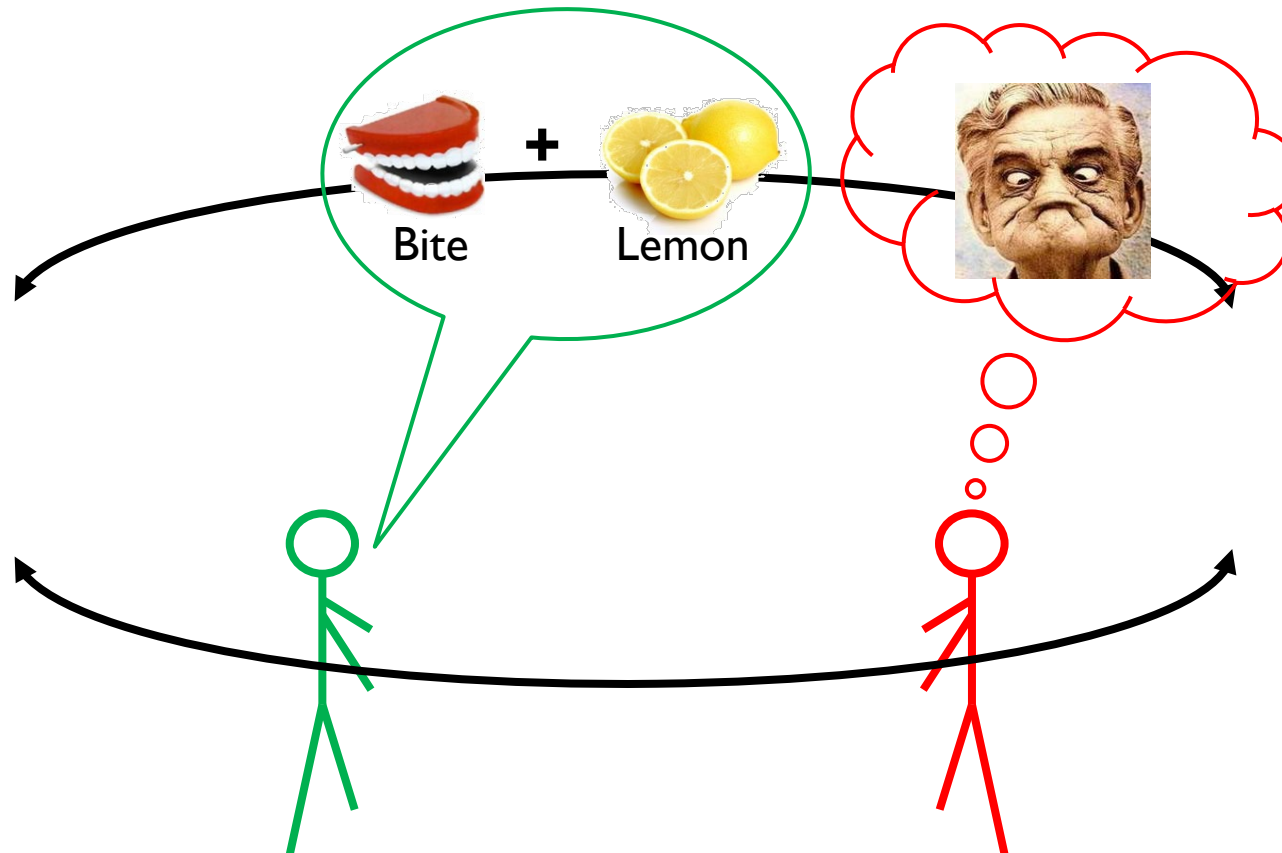


≈
**Brain-to-brain
communication?**

Gallese et al.; Iacoboni et al.; Rizzolatti et al. 1996...
See <http://www.pbs.org/wgbh/nova/sciencenow/3204/01.html>

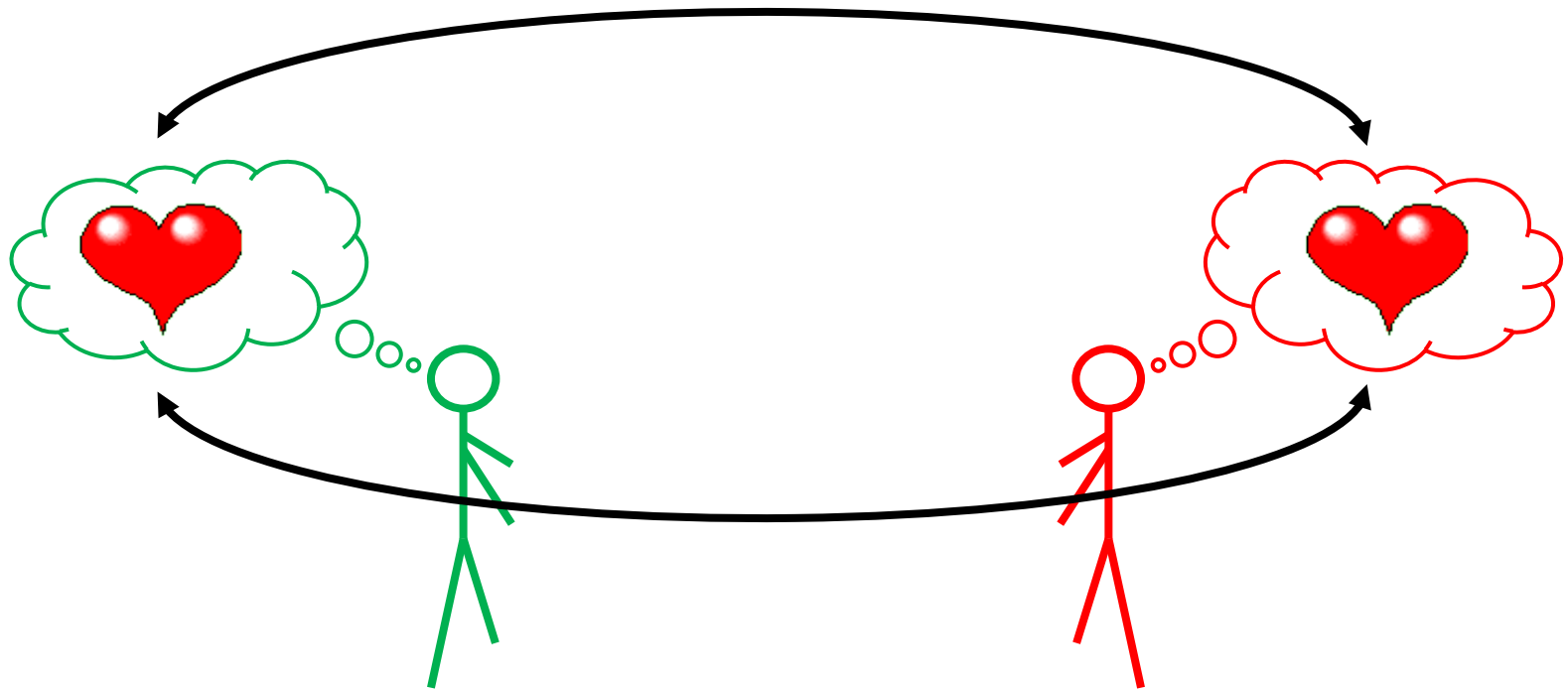
Mirror neurons and inter-subjectivity?

- ▶ What one does affects the other...

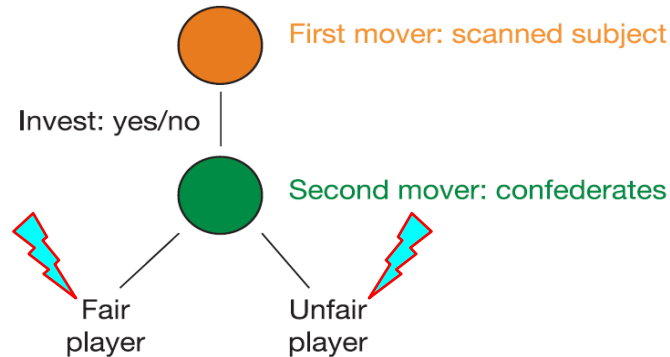


Mirror neurons and inter-subjectivity?

- ▶ Empathy?
- ▶ Sympathy?
- ▶ Perspective-taking?

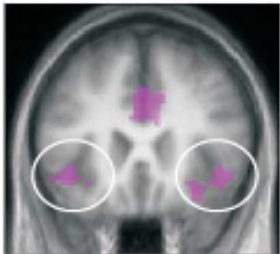


Fairness and Empathy: Pain and reward differences

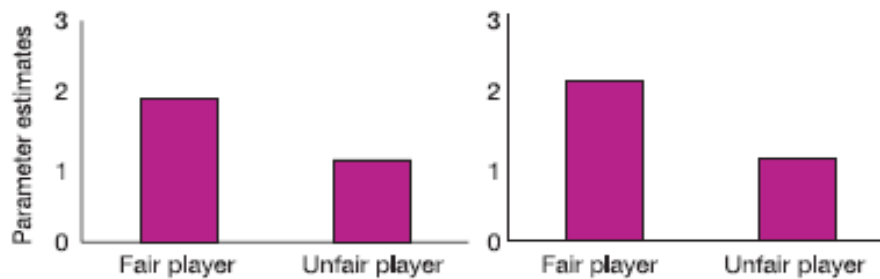


- In women, seeing any player suffering activates empathy networks
- In men, only for fair players. It activates reward circuits for unfair players

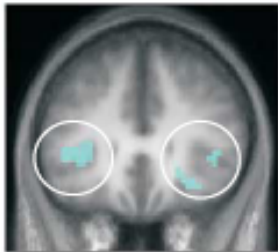
a Women



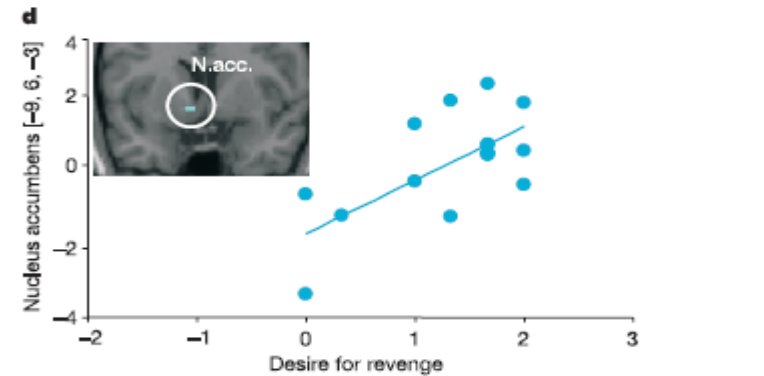
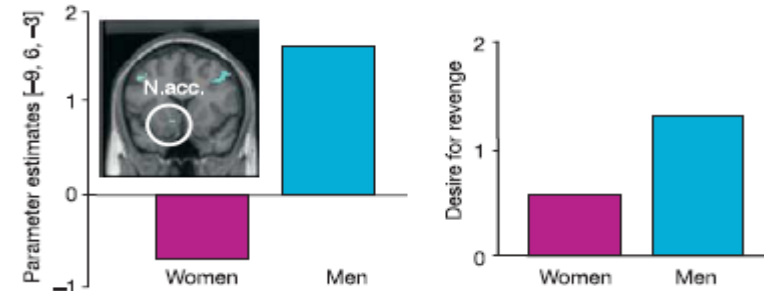
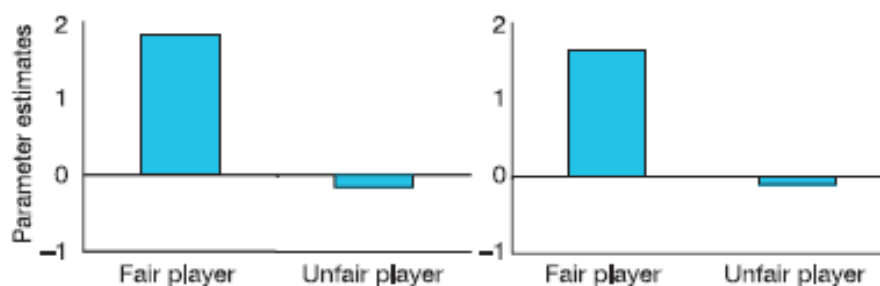
c



b Men



d



Singer et al 2006

Warning: Cognition > Empathy

PSYCHOLOGICAL SCIENCE

Research Article

Why It Pays to Get Inside the Head of Your Opponent

The Differential Effects of Perspective Taking and Empathy in Negotiations

Adam D. Galinsky,¹ William W. Maddux,² Debra Gilin,³ and Judith B. White⁴

¹Northwestern University; ²INSEAD; ³Saint Mary's University, Halifax, Canada; and ⁴Dartmouth College

ABSTRACT—The current research explored whether increased yet distinct social competencies—perspective taking (the cognitive capacity to consider the world from another individual's viewpoint) and empathy (the ability to connect emotionally with another individual)—have differential effects in negotiations. Across three studies, using both individual difference measures and experimental manipulations, we found that perspective taking increased individuals' ability to discover hidden agreements and to both create and claim resources at the bargaining table. However, empathy did not prove nearly as advantageous and at times was detrimental to discovering a possible deal and achieving individual profit. These results held regardless of whether the interaction was a negotiation in which *aprima facie* solution was not possible or a multiple-issue negotiation that required discovering mutually beneficial trade-offs. Although empathy is an essential tool in many aspects of social life, perspective taking appears to be a particularly critical ability in negotiations.

In October 1962, the United States and the former Soviet Union came to the brink of nuclear war in the Cuban Missile Crisis. Yet in the middle of this harrowing conflict, President John F. Kennedy managed to devise a strategic plan to prevent potential annihilation—a plan that also did not sacrifice his country's long-term interests. While publicly refusing to remove any of America's missiles placed near the Soviets (i.e., no quid pro quo on missile removal), Kennedy offered that if all nuclear weapons were removed from Cuba, the United States would pledge not to invade

Cuba in the future. This deal allowed Soviet Premier Nikita Khrushchev to declare that he had saved Cuba from attack, and therefore satisfied his core interests of saving face and retaining power.

This example illustrates the powerful advantage of having a deep understanding of one's opponent. Kennedy's proposal was suggested by an advisor, Tommy Thompson, who had lived with Khrushchev and had intimate knowledge of his fundamental interests. In fact, in disparate domains such as chess, poker, politics, and business, knowing the motives and likely behaviors of an adversary can illuminate strategies to secure personal gain, the downfall of one's nemesis, and even long-term peace (Axelrod, 1987; Fiedler, 1990; Lopes, 1976; Thagard, 1992). Negotiators, for example, must often understand the other party's interests to obtain the best outcome for themselves (Fisher, Ury, & Patton, 1991; Thompson, 1990; Thompson & Hastie, 1990).

Given that understanding one's opponent is valuable for success in competitive interactions, it seems likely that individual characteristics associated with such understanding would prove advantageous. In this vein, two related but distinct social competencies—perspective taking and empathy—have been shown to motivate social understanding across a variety of contexts. Although the terms *perspective taking* and *empathy* are often used interchangeably there is clear evidence of their differences (Coke, Batson, & McDavis, 1978; Davis, 1980, 1983; Deitch & Malle, 1975; Hoffman, 1977; Oswald, 1996). Perspective taking is a cognitive capacity to consider the world from other viewpoints and “allows an individual to anticipate the behavior and reactions of others” (Davis, 1983, p. 115). Empathy, in contrast, is an other-focused emotional response that allows one person to affectively connect with another. Sometimes labeled sympathy or compassion, empathy is often considered to be an emotion of concern experienced when

ABSTRACT—The current research explored whether two related yet distinct social competencies—perspective taking (the cognitive capacity to consider the world from another individual's viewpoint) and empathy (the ability to connect emotionally with another individual)—have differential effects in negotiations. Across **three studies**, using both individual difference measures and experimental manipulations, we found that **perspective taking increased individuals' ability to discover hidden agreements and to both create and claim resources at the bargaining table**. However, **empathy did not prove nearly as advantageous and at times was detrimental to discovering a possible deal and achieving individual profit**. These results held regardless of whether the interaction was a negotiation in which a *prima facie* solution was not possible or a multiple issue negotiation that required discovering mutually beneficial trade-offs. Although empathy is an essential tool in many aspects of social life, perspective taking appears to be a particularly critical ability in negotiations.

Oxytocin: a peptide that affects “away” v. “towards” modes



Oxytocin is a peptide of nine amino acids (a nonapeptide). « ocy » from, Greek *ôkus* : rapid and « tocine » from *tokos* : labour

H—Cys—Tyr—Ile—Glu—Asn—Cys—Pro—Leu—Gly—NH₂

Oxytocin modulates neural circuitry for social cognition and fear in humans.

Kirsch P, Esslinger C, Chen Q, Mier D, Lis S, Siddhanti S, Gruppe H, Mattay VS, Gallhofer B, Meyer-Lindenberg A.

Cognitive Neuroscience Group, Center for Psychiatry and Psychotherapy, Justus-Liebig University, D-35385 Giessen, Germany.

In non-human mammals, the neuropeptide oxytocin is a key mediator of complex emotional and social behaviors, including attachment, social recognition, and aggression. Oxytocin reduces anxiety and impacts on fear conditioning and extinction. **Recently, oxytocin administration in humans was shown to increase trust, suggesting involvement of the amygdala, a central component of the neurocircuitry of fear and social cognition that has been linked to trust and highly expresses oxytocin receptors in many mammals.** However, no human data on the effects of this peptide on brain function were available. Here, **we show that human amygdala function is strongly modulated by oxytocin.** We used functional magnetic resonance imaging to image amygdala activation by fear-inducing visual stimuli in 15 healthy males after double-blind crossover intranasal application of placebo or oxytocin. Compared with placebo, **oxytocin potently reduced activation of the amygdala and reduced coupling of the amygdala to brainstem regions implicated in autonomic and behavioral manifestations of fear.** Our results indicate a neural mechanism for the effects of oxytocin in social cognition in the human brain and provide a methodology and rationale for exploring therapeutic strategies in disorders in which abnormal amygdala function has been implicated.

PMID: 16339042 [PubMed - indexed for MEDLINE]

Oxytocin's Impact on Amygdala in Humans

The Journal of Neuroscience, December 7, 2005 • 25(49):11489–11493 • 11489

Brief Communication

Oxytocin Modulates Neural Circuitry for Social Cognition and Fear in Humans

Peter Kirsch,¹ Christine Esslinger,¹ Qiang Chen,^{2,4} Daniela Mier,¹ Stefanie Lis,¹ Sarina Siddhanti,^{3,4} Harald Gruppe,¹ Venkata S. Mattay,^{2,4} Bernd Gallhofer,¹ and Andreas Meyer-Lindenberg^{2,3,4}

¹Cognitive Neuroscience Group, Center for Psychiatry and Psychotherapy, Justus-Liebig University, D-35385 Giessen, Germany, and ²Neuroimaging Core Facility, ³Unit for Systems Neuroscience in Psychiatry, and ⁴Clinical Brain Disorders Branch, Genes, Cognition, and Psychosis Program, National Institute of Mental Health, National Institutes of Health, Department of Health and Human Services, Bethesda, Maryland 20892

In conclusion, our data reveal a pronounced impact of oxytocin on amygdala reactivity and brainstem interactions in humans, extending a large body of work on neuropeptide regulation of complex behavior to this species by establishing an effect of oxytocin on a key component of affective and social processing. We hope that this work will contribute to the development of therapeutic interventions with oxytocin or synthetic agonists in diseases in which amygdala dysfunction has been implicated, including anxiety disorders, depression, and autism.

Kirsch et al. 2005

11492 • J. Neurosci., December 7, 2005 • 25(49):11489–11493

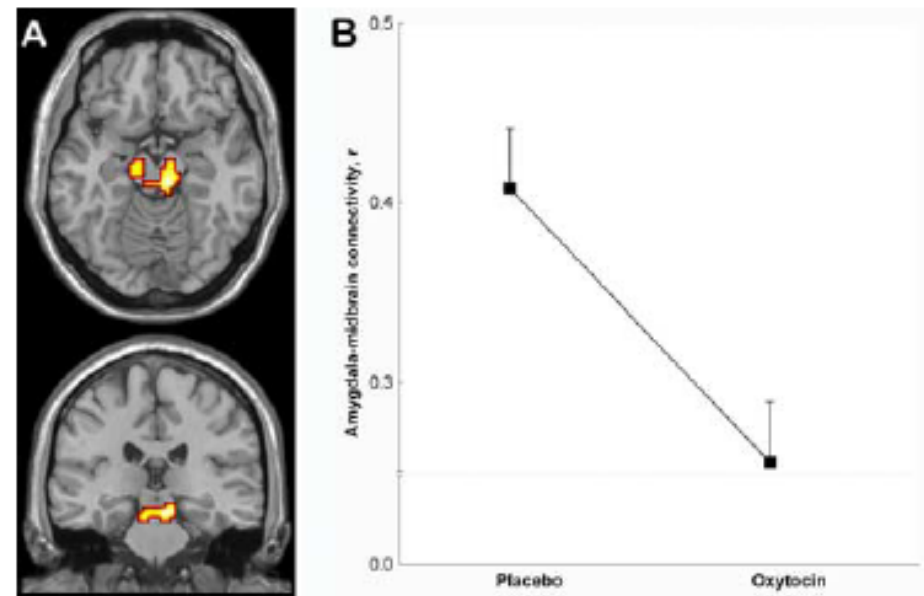
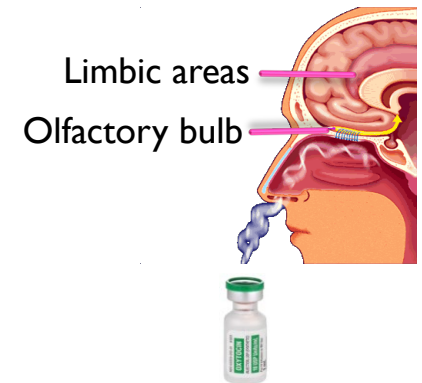


Figure 2. Significant decrease in coupling of the amygdala to the midbrain under oxytocin. *A*, Maps of significant difference in connectivity from the amygdala to the midbrain, in neurological orientation. See Table 2 for statistical information. *B*, Plot of oxytocin effect on correlation with the amygdala (Pearson's *r*) at the midbrain location showing maximum linkage to the amygdala during the placebo condition (coordinates: $-6, -24, -15$), highly significant decrease under oxytocin ($p < 0.004$; *t* test).

The effect of intranasal Oxytocin on human behaviour

- ▶ Increases trust (Kosfeld et al. 2005)
- ▶ Increases generosity (Zak et al. 2007)
- ▶ Reduces fear (Kirsch et al. 2005)
- ▶ Improves mind-reading (Domes et al. 2007)
- ▶ Positive vs. Negative emotion processing (Simplicio et al. 2009)
- ▶ Increases memory for familiar faces (Rimmele et al. 2009)
- ▶ Increases positive communication and reduces cortisol levels during couple conflict (Ditzen et al. 2009)



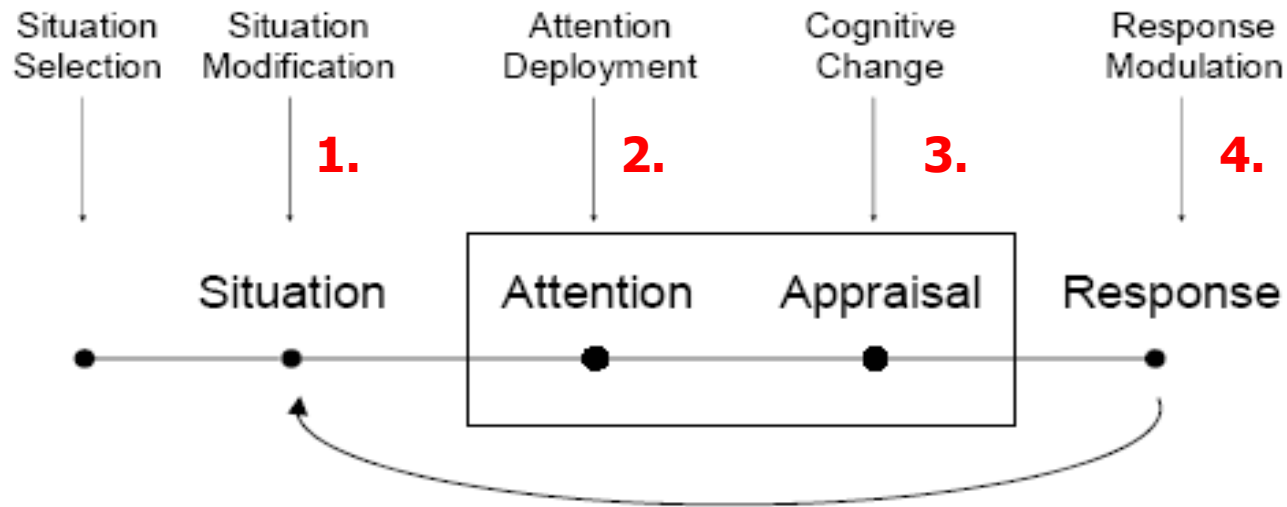
See also Ken Cloke's article: *Bringing Mediation into the Room*
<http://www.mediate.com/articles/cloke8.cfm>

New considerations for neutrals

“We know, for example, that the hormone oxytocin is involved in bonding, and that it increases as people develop trust. If people can be coached to display trusting behaviors, oxytocin levels may increase, supporting collaborative negotiation exchanges. Another neurobiological example comes from mirror cells, now known to be the basis for empathy. Learning ways to stimulate mirror cells would add important dimensions to negotiators’ repertoires.”

LeBaron & Patera Rethinking Negotiation Training (2009)

Technique: 4 critical junctures for mediator intervention?



1. Change the situation

- Take a break
- Caucus

2. Draw attention to something else

- Give a task
- Change topic

3. Create a cognitive change

- Reframe/reformulate
- Create a dissonance (e.g., role-play)

4. Modulate the response

- Non-violent communication (e.g., giraffe v. wolf speech)

*Source: F Bogacz based on
Ochsner & Gross - 2005*

“Looping”: a C-system generating technique?

1. You inquire
2. The other person responds
3. You demonstrate your understanding and test it with the other person
4. Did they confirm your understanding?
 - (a) If no, go back to step 1
 - (b) If yes, ask another question and “loop” again.

What is the effect on the amygdala/cortical interactions?

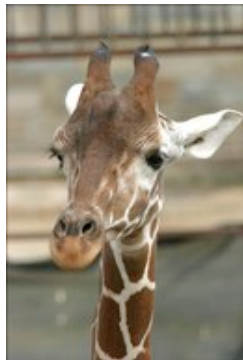
Does this induce oxytocin release?

Based on Robert Mnookin Beyond Winning 2000 1st ed. pp. 63-65,
and the teachings of Gary Friedman and Jack Himmelstein

Looping between the Cortical and Reptilian Pathways?

Non-Violent Communication: What happens when we “translate” threats into needs? Can we “shift frequencies” by “translating” reptilian expression/perception into cortical thought/perception? Can we use mirror neurons to create what Marshall Rosenberg describes as a “connection of the heart”?

GIRAFFE
(cognitive?)



WOLF
(limbic/reptilian?)



We respond differently to stimuli ...



... depending on how we hear them ...

S
P
E
A
K

H
E
A
R

Source: Marshall Rosenberg

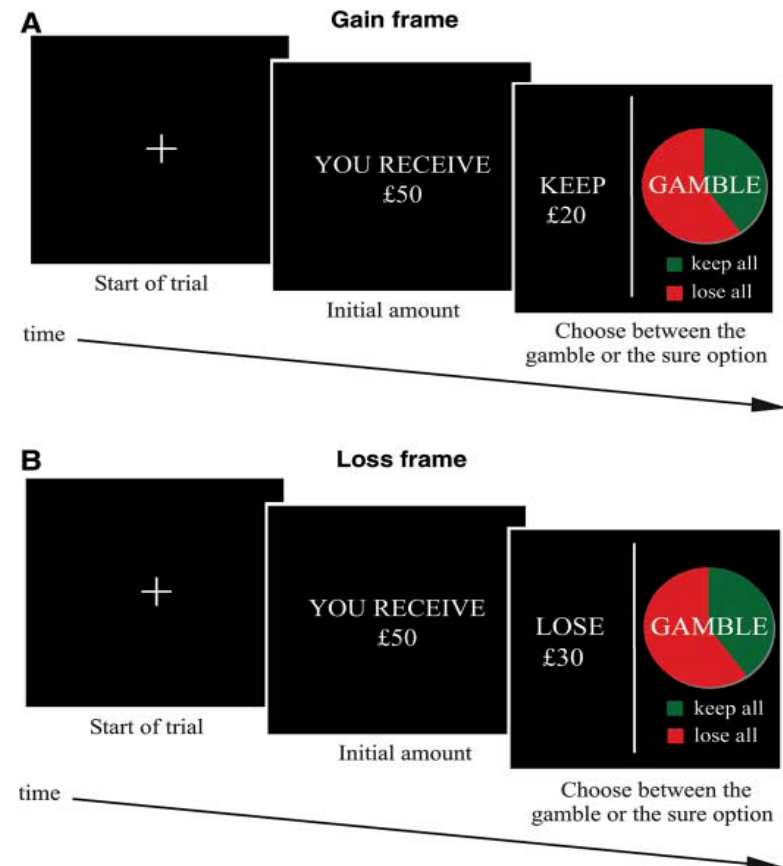
Reframing as a “Neuro-intervention” (“Keep” v. “Lose”)

Frames, Biases, and Rational Decision-Making in the Human Brain

Benedetto De Martino,* Dharshan Kumaran, Ben Seymour, Raymond J. Dolan;
Wellcome Department of Imaging Neuroscience (UK)

Human choices are remarkably susceptible to the manner in which options are presented. This so-called “framing effect” represents a striking violation of standard economic accounts of human rationality, although its underlying neurobiology is not understood. We found that the framing effect was specifically associated with amygdala activity, suggesting a key role for an emotional system in mediating decision biases. Moreover, across individuals, orbital and medial prefrontal cortex activity predicted a reduced susceptibility to the framing effect. This finding highlights the importance of incorporating emotional processes within models of human choice and suggests how the brain may modulate the effect of these biasing influences to approximate rationality.

The Framing Effect: De Martino 2006



Source http://economistsview.typepad.com/economistsview/2006/08/the_framing_eff.html

Using opening phase as a critical moment

- First physical/intuitive impressions
 - Relaxed but alert posture, positive energy, friendliness ...
 - Anchor words and concepts
 - You never have a 2nd chance at a 1st impression
- Status
 - Clarify & acknowledge Status (role, powers & limits, etc)
 - Use confidentiality to grow Status to that of a “trusted person”
- Certainty/Autonomy
 - Explain process & help set an agenda designed by and for the parties
 - Emphasize choices: voluntary, non-binding, etc.
 - Elicit expectations carefully to avoid disillusion
 - Divide the process into phases to increase certainty
- Relatedness
 - Emphasize “their process” and “their outcome”
- Fairness
 - Discuss “Fairness” as a possibly shared value
 - Discuss psychological sense of Fairness as a subjective concept
 - Fairness is not the “neutrality” or “impartiality” of the mediator

Source: F Bogacz based on
David Rock, Neuroleadership Institute
http://www.your-brain-at-work.com/files/NLJ_SCARFUS.pdf

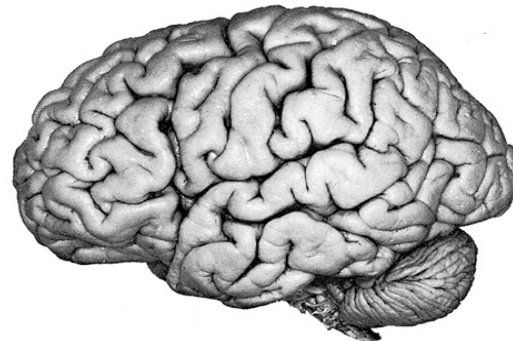
Using “**SCARF**” as a procedural compass?

- **Respect Status**
 - Mutual respect
 - Emphasis on subjective needs and interests
 - Active listening
- **Create Certainty**
 - Summarize
 - Reformulate
 - Discuss steps
- **Acknowledge Autonomy**
 - ACBD (Always Consult Before Deciding)
 - Creates choices
- **Grow Relatedness**
 - “Looping”
 - Joint sessions v. caucus?
 - Improve relatedness
- **Demonstrate Fairness**
 - Emphasis on mutual rewards
 - Time devoted to each party
 - Neutrality in perspective taking vs. empathy
 - Reserve empathy to caucuses?
 - Reality testing v. arguing the other side’s position

Source: F Bogacz based on
David Rock, Neuroleadership Institute
http://www.your-brain-at-work.com/files/NLJ_SCARFUS.pdf

In Conclusion: Greater attention to «neuro-procedure»?

*“We have to start by
defining the process as
part of the problem”*



David Plant