

Application of Psychology and Neuroscience in Solving Business Problems

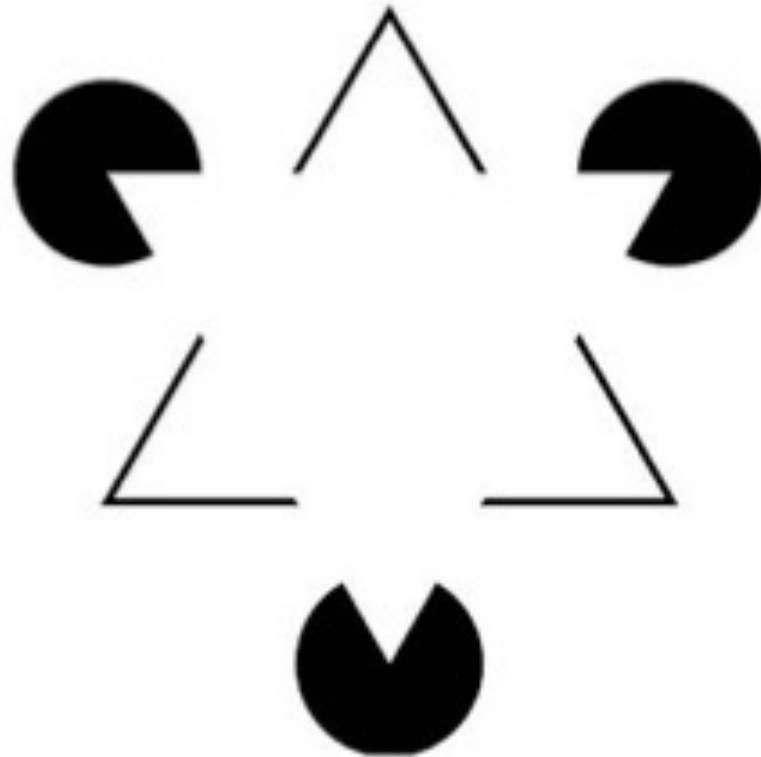
Arvind Sahay

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Professor of Marketing and International Business

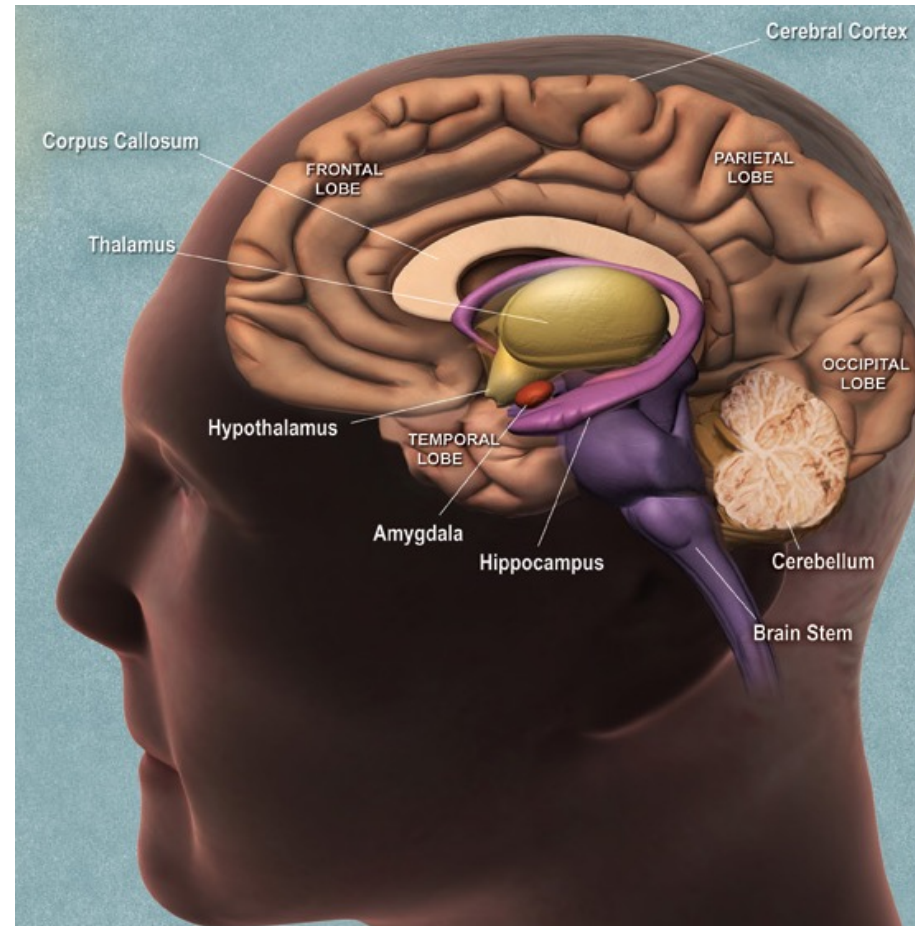
Arvind.sahay@mdi.ac.in; asahay@iima.ac.in;
arvin.sahay@yahoo.com

What do you see?



Source: Gaetano Kanizsa 1955

We Choose Products, Brands, Packaging, People in the Brain




Fore-Brain

Mid-Brain

Hind-Brain

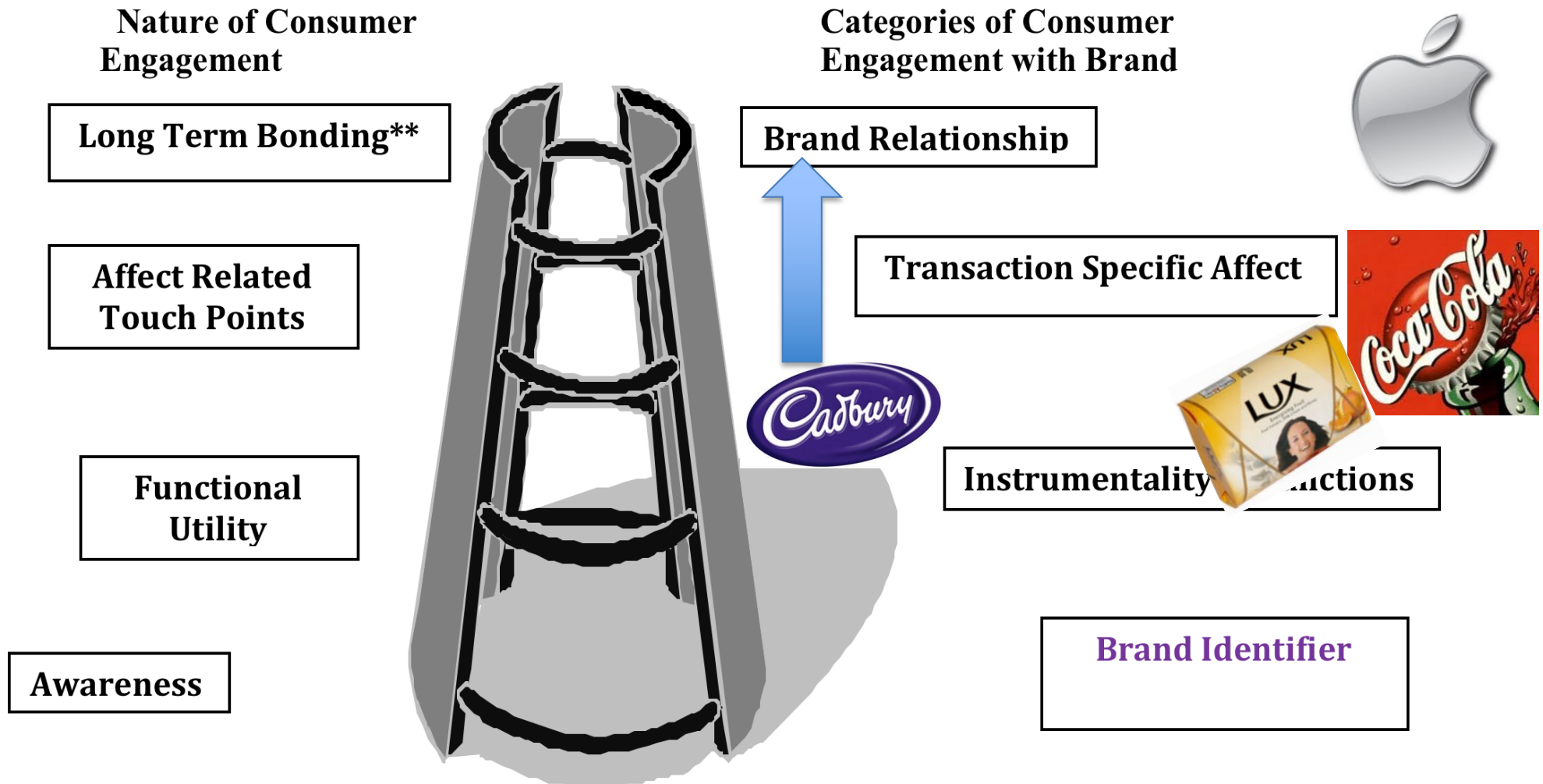
**The Choice is a Combination of Conscious, Unconscious, Reason and Emotion Factors
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And is influenced by how the brain works.**

Agenda

1. How the Brain Perceives Reality 
2. How the Brain Operates – Brain Operating Principles and Decision Making
3. The Use of Memory
4. Neuro Tools

The Reality of Products / Brands in the Brain

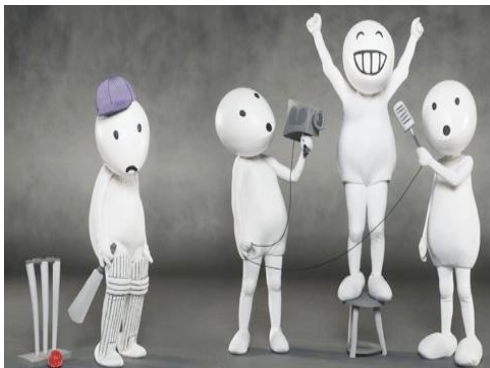
The Brand Ladder*



Brands and Neuroscience

- A first choice brand leads to reduced activation in DLPFC; increased activation in VMPFC (an important center for affect)
- Exposure to top brand reduces analytical comparisons (reduced activation of DLPFC) and evokes vivid emotional associations (VMPFC) - (demonstrated for cars and beverages)

In summary, a brand needs to feel the same, not necessarily look the same.



Agenda

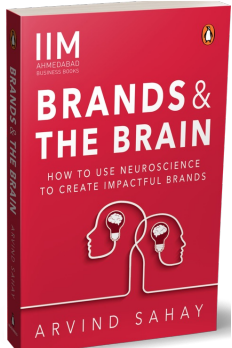
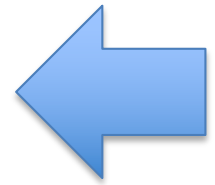
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2. How the Brain Operates – Brain Operating Principles and Decision Making for Brands

- BOP and Brands
- Decision Making and Brands

3. Memory and Perception of Reality

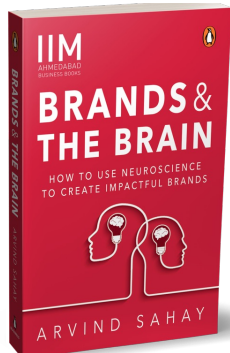
4. Neuro Tools



Topic 1: What are some key brain operating principles that underlie brain activity?

How do these connect to success odds for brands?

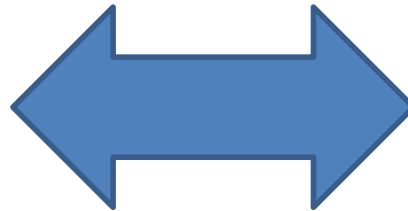
1. Feel Good, secure, Avoid Pain, Get Reward, etc.
2. Conserve Energy
3. Group, Patternize, Categorize
4. Pay attention to contrasts, extremes, peak shifts
5. Mirroring, connecting; social confirmation



Brain Operating Principles: Objectives and Processes - 1

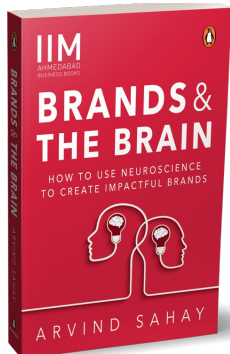
– Brain Objectives:

- **Feel Good**
- **Survive**
- **Get rewards**
- **avoid pain**
- **mate**
- **feel secure**



Neuro-transmitters

- Dopamine
- Serotonin
- Aceletcholine
- Oxytocin
- Vasopressin
- Testosterone
- Progesterone
- Oestrogen
- Adrenalin
- BDNF
- Norepineprine
- ...



Sahay 2022; Chapter 2

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Zindagi ke saath bhi;
Zindagi ke baad bhi



Sir Uthaa ke jiyo

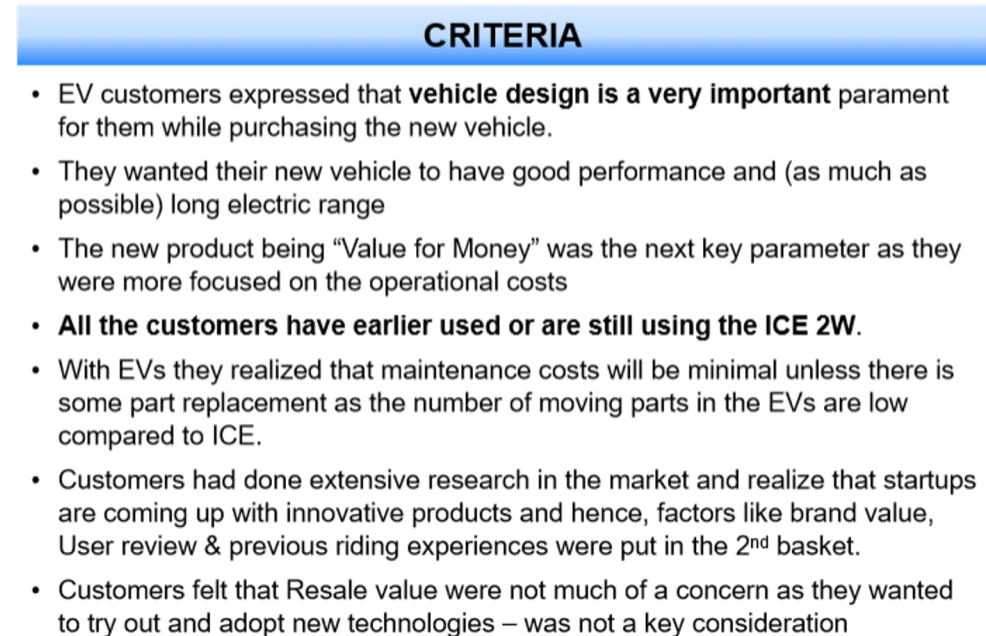
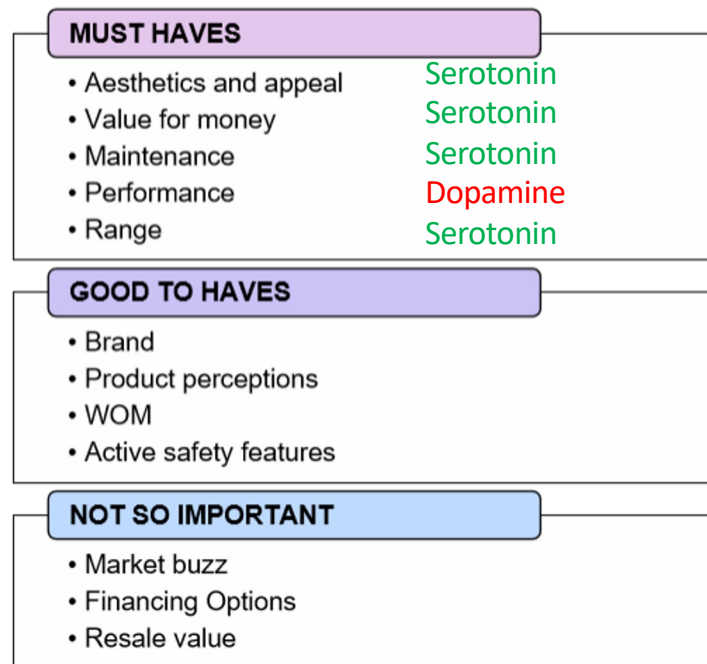


Which neurotransmitters drive the purchase of this product / brand?

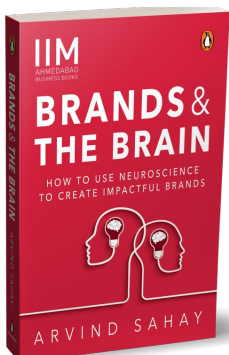
Customer Requirements and Neurotransmitters

VEHICLE PURCHASE JOURNEY - EV

Design (Visual appeal), Value for money, maintenance (Financial aspects) were the most important considerations for the EV customers.



- **We will choose products, brands, packaging, people, events that give us more of the neurotransmitters that we want... the mix of neurotransmitters that a person wants is a function of their personality, mood, time of day, product class, etc.**

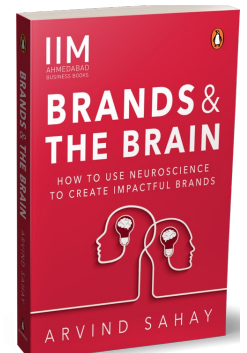


- **Feel Good, Secure**
- **Conserve Energy**
- **Group; Patternize**
- **Contrast, Extreme**
- **Mirroring; Connect**

Brain Operating Principles: Objectives and Processes - 2

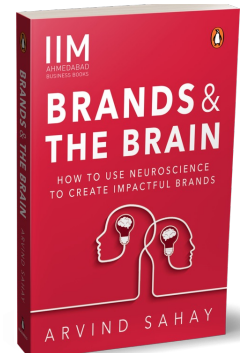
The Process (these are hard wired)

Brain Conserves Energy



The Brain Tries to Save Energy

- 30-50 Watts: 2% body weight and 25% energy.
- Conscious Deliberate Attention is hard work
- Tendency to
 - push to unconscious; more efficient in terms of energy consumption
 - Get into "flow" (less relevant from a purchase context standpoint)
- Rely on cognition AND affect



- **We will choose products, brands, packaging, people, events that, ceteris paribus, require lower energy consumption.**

- **Feel Good, Secure**
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- **Group; Patternize**
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- **Mirroring; Connect**

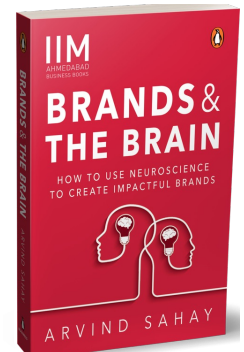
Brain Operating Principles: Objectives and Processes - 3

The Process (these are hard wired)

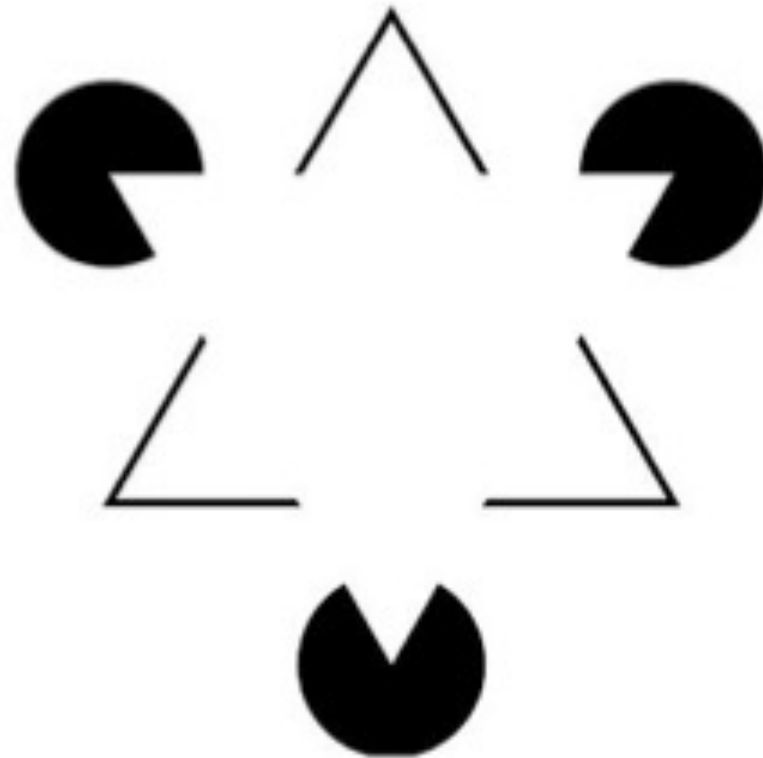
– Grouping; patterning; categorization



**WE tend to group; to categorize
to see patterns...**



Brain Operating Principles: Objectives and Processes – 3: Why we See Triangles - Patterns!!!



Source: Gaetano Kanizsa 1955



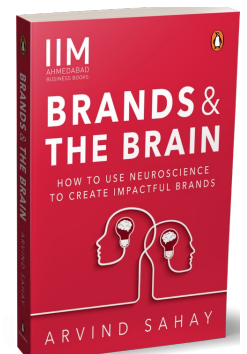
- **We will choose products, brands, packaging, people, events that are a fit with existing patterns in the mind**
 - **Stories are patterns and lower energy consumption...**
- One Kind of a Story
 - A hero
 - Faces challenges; the more difficult the challenge, the larger the odds, the more attention it engages
 - Heroically faces challenges and works hard to overcome challenges
 - Overcomes challenges and emerges victorious



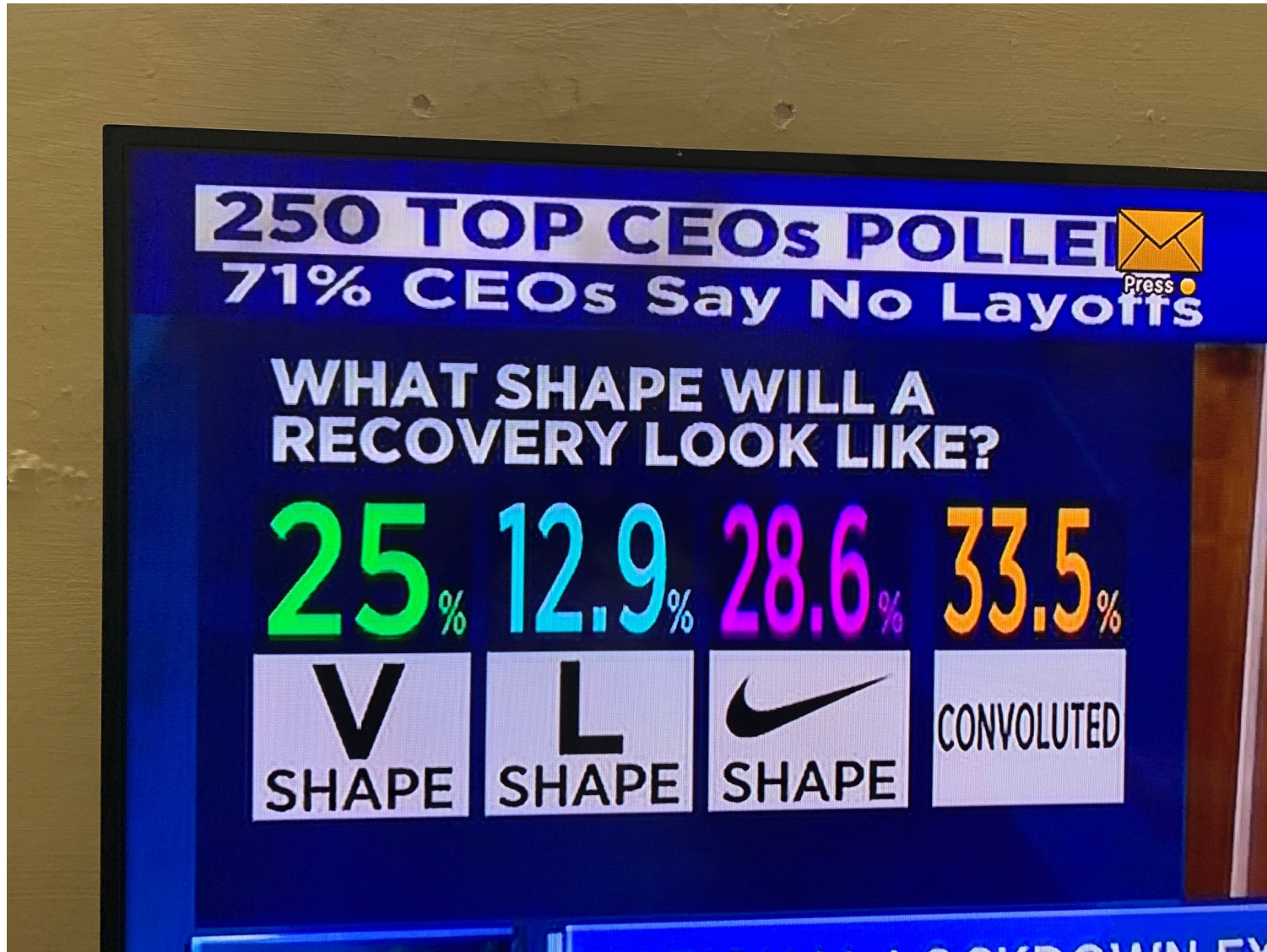
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A Story Resonates Because...

- It saves energy for the brain
- It creates meaning and patterns (serotonin, sometimes vasopressin, norepinephrine)
- It provides contrasts and gets attention (dopamine)
- Lodges itself into memory



**The Brain Looks for certainty:
CNBC TV18 Poll of 250 CEOs in 2nd week of May 2020**

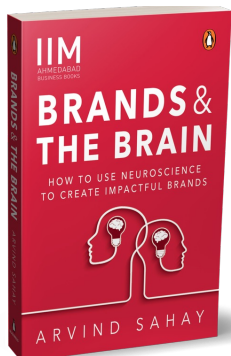


Patterns = Certainty = Serotonin

Brain Operating Principles: Objectives and Processes - 4

The Process (these are hard wired)

– Peak shift; extremes; contrasts; reference points



Sahay 2022; Chapter 2

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MATTER – AERA TG

The Innovators and Early adopters, Male 22-40 Age group

AS PEOPLE

Young urban males, everyday riders
 Driven by status, love to flaunt
 Finding their voice through brands
 Educated risk-takers
 Yet pragmatic & budget driven
 Seeks 'smart value'



ATTITUDE TO TECH

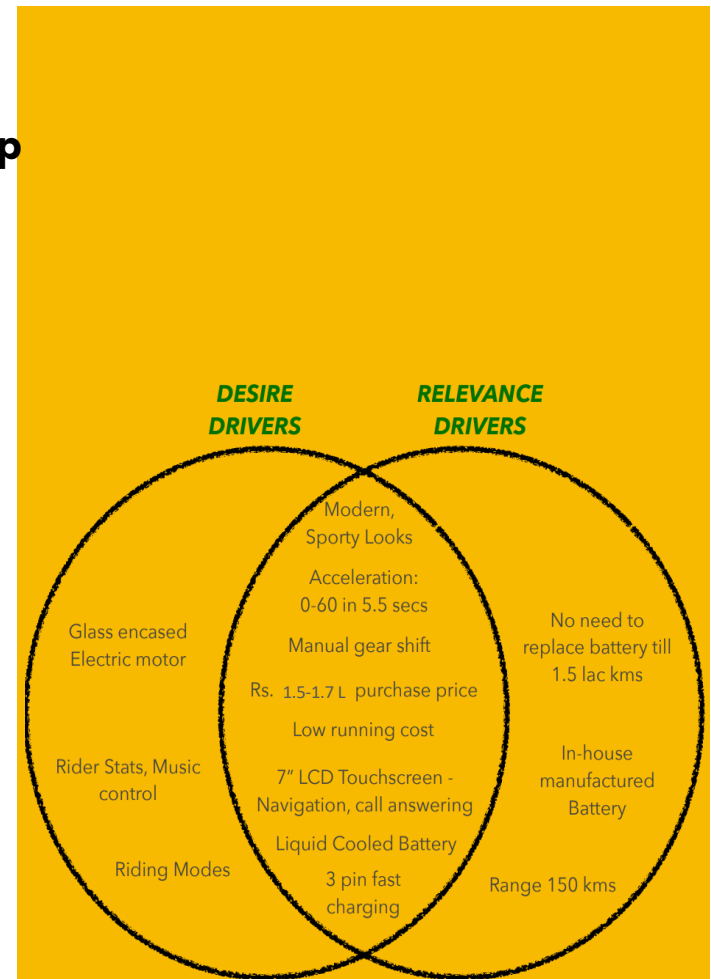
Born to tech, live the 'tech-life'
 Multi-tasking feature-geeks
 Constantly connected with their world
 Gamers at heart, excitement-seekers through tech
 Smart decision makers, yet seek opinions & validation
 Armchair sustainability champions

ATTITUDE TO LIFE

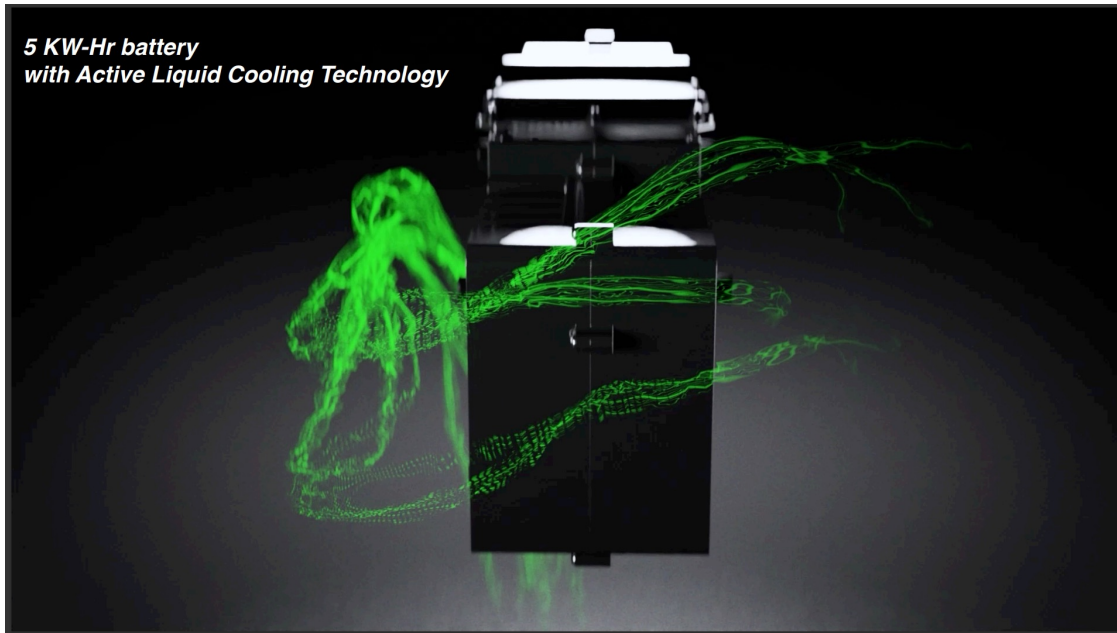
Convenience; stuff must 'wrap around me'
 FOMO, even FONO. Bold experimenter
 First among equals, seeks standout
 Constant broadcaster on SM
 Experience is everything
 Designs that shout 'me'

ATTITUDE TO BIKING

Bike is an extension of me
 Boldest way to express myself
 Aspiring bikers, see biking as a passion
 Urban road-warriors, frustrated by the city
 Seek the belonging of a community, unique RX
 Increasingly see bikes as a connected gadget-of-life



Contrast / Peak shift

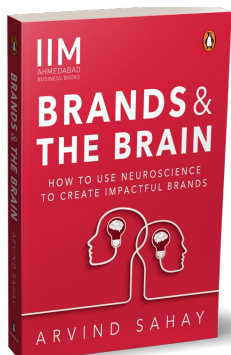


ACTIVE LIQUID COOLING CAUGHT THEIR ATTENTION

One Pre-booking Visual



- **We will choose products, brands, packaging, people, events that are different from other brands in ways that matter to us, that gives us a dopamine / acetylcholine / vasopressin high.**
- **So we want both patterns and contrasts at the same time!!!**
- **This the balancing act that brands have to perform...**



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- **Feel Good, Secure**
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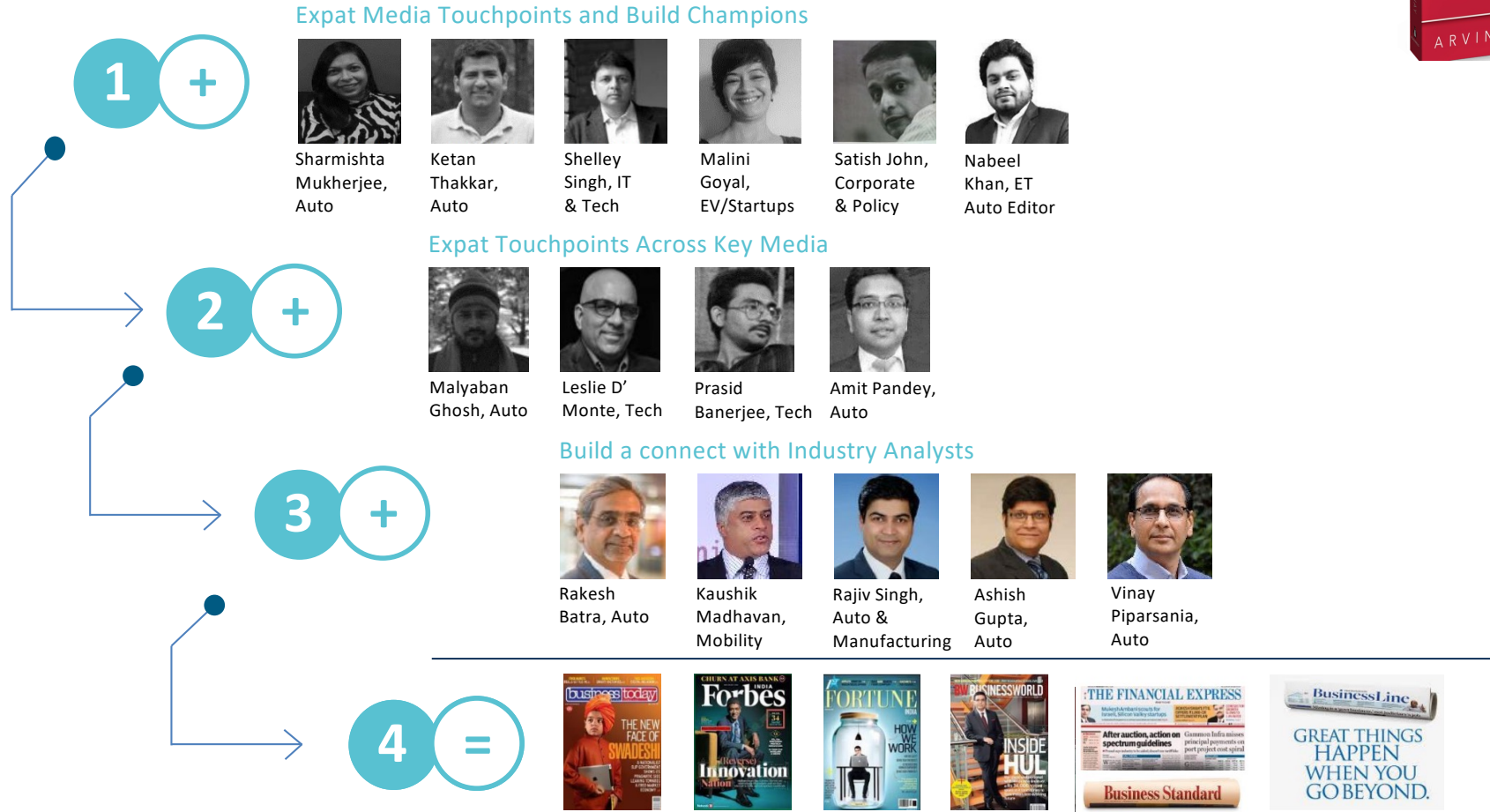
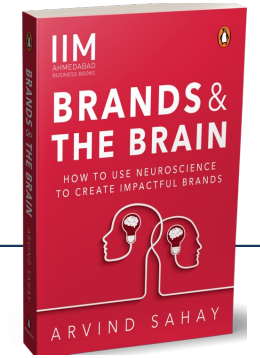
Brain Operating Principles: Objectives and Processes - 5

The Process (these are hard wired)

– Mirroring, Social Confirmation, Imitation.



BATTERY/TECH INFLUENCERS



GREAT THINGS HAPPEN WHEN YOU GO BEYOND.

MATTER – AERA Media strategy

Strategy : Impact & Reach

TG Audience reach– 90 Million across key markets

Effective Retargeting with 5+ Frequency – 30 Million



Media Vehicles

TV – GEC + News + Movies – 10,000 spots

Billboards – 300 + sites

Digital – 300 Million impressions

Meta – 50 M, Google – 200 M, Flipkart – 30 M, Bikewale + Bikedekho – 20 M + 50 M Influencer content

PR – 500 + Articles



Views & Clicks

60 Million Ad views through TV

35 Million visibility through billboards

6 M Views of TV Ad on Digital + 1 M views of Influencer content

5 M Clicks on Digital Ads



2 M active
users on website



40 K

Prebooks

- **We will choose products, brands, packaging, people, events that get amplified through others either directly (many people talking about an OOH at a rest stop like Amul adverts) or indirectly (amplified through social media – like the CVS Pharmacy advert in Times Square) .**
- **We buy products, brands, packaging, people, events that we see others talking about and / or buying!!!**

- **Feel Good, Secure**
- **Conserve Energy**
- **Group; Patternize**
- **Contrast, Extreme**
- **Mirroring; Connect**

Taking a Decision and Brain Operating Principles: How the Brain Works

– Brain

Objectives:

- Feel Good;
- Survive;
- Get rewards;
- avoid pain,
- mate;
- feel secure



**Mirroring:
Social Confirmation**

Grouping

Product M1- Market Research

ELEMENTS THAT CAUGHT THEIR EYE AND IMPRESSED THEM

Integrated turn indicators in the front



"Never seen something like this. It's not mundane design." - 150-180cc_Bangalore

Headlights



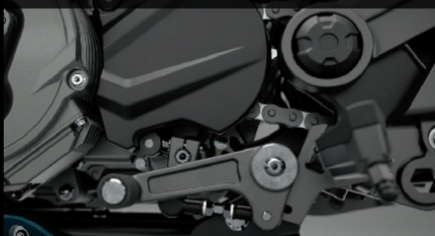
"Reminds me of Optimus Prime. Or that Velociraptor dinosaur" - 110-125cc_Pune

Glass encased motor



"We get to see such exposed mechanism in only high end bikes like Ducati - 200-250cc_Pune

Gear shift + chain drive



"Pleasantly surprised to see manual gear and chain drive in an EV." - 200-250cc_Delhi

Alloy wheels with disc brakes



"New petal like alloy wheel design. And its good that there's disc brakes on both tyres" - EV_Bangalore

LCD screen



"Nice big LCD console" - 150-180cc_Delhi

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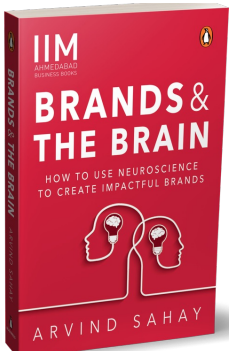
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- BOP and Brands
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3. Memory and Perception of Reality

4. Neuro Tools



Conscious and Unconscious: a large part of our decision making is unconscious emotion

	Conscious	Unconscious
Primarily Cognition and Reason Based	20-50% (deliberate and conscious reasoning)	20-40% (Heuristics)
Primarily Affect and Emotion Based	10-30% (recognition of emotions they are happening)	<u>30-60% (below the radar completely)</u>

After two repetitions of a stimulus, the human brain automatically, unconsciously and uncontrollably expects a third repetition

Anticipating a gain is on many occasions more pleasurable than actually receiving the gain

Source: Author estimates from the research literature

1. Dolcos, Iordan and Dolcos 2011
2. Shiv 2007
3. Knutson et. al. 2007
4. Bechara and Damasio 1999
5. Sahay 2022 Chapters 2 and 3

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- **Feel Good, Secure**
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**PRIMARY TG:
150-180cc SPORTY COMMUTER**

**SECONDARY TG:
110-125cc COMMUTER (UPPER END)**

**DESIRE
DRIVERS**

**RELEVANCE
DRIVERS**

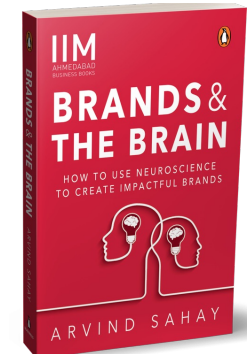


**DESIRE
DRIVERS**

**RELEVANCE
DRIVERS**



Making Decisions



- Which option *feels* right?
- memories
- mental short cuts
- **Make selection, then rationalize after.**

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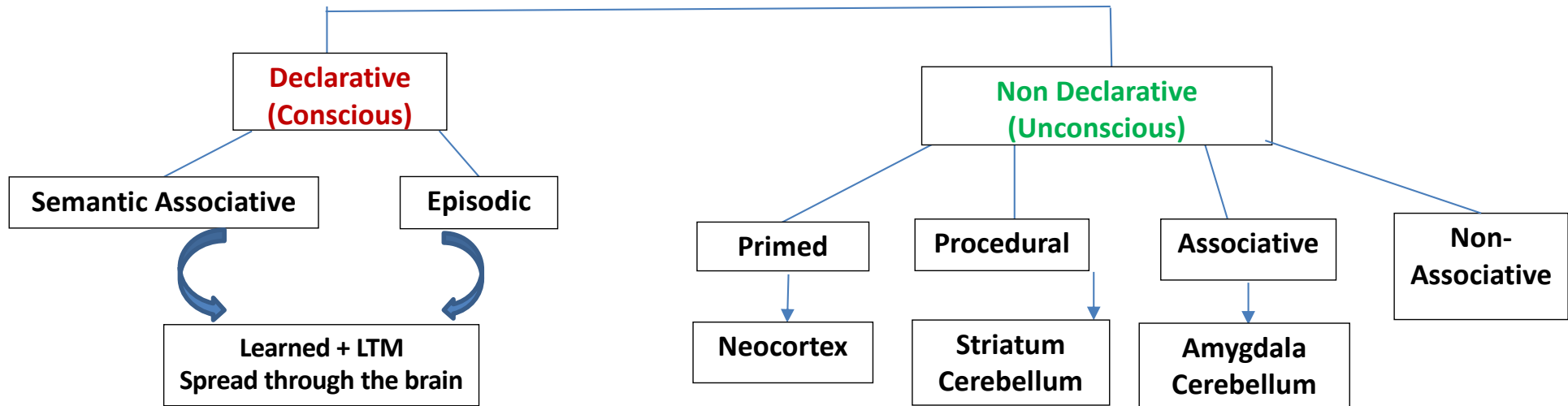
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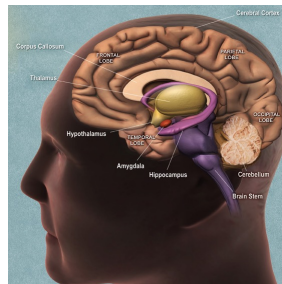


Types of Memory

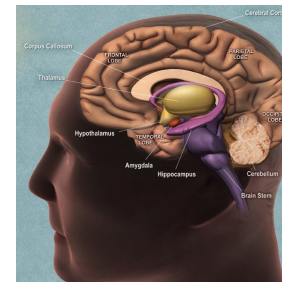
What is the nature of consumer memories for brands?
 How does one decide which kind of memory should be the primary focus for a brand?



These memories require the Hippocampus



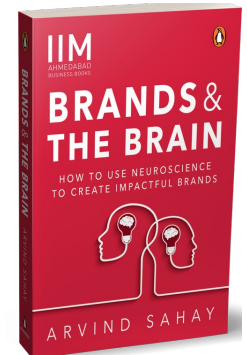
These memories develop without the Hippocampus



- Feel Good, Secure
- Conserve Energy
- Group; Patternize
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Making Decisions

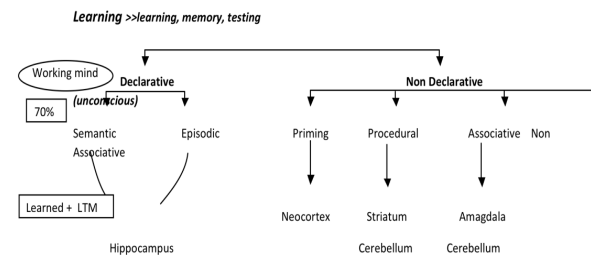
Given the nature of brand memories and decision making in the brain, what are the basic building blocks of brand building and sustenance?



- Which option *feels* right?
- memories
- mental short cuts
- Make selection, then rationalize after.

	Conscious	Unconscious
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Memories



- Feel Good, Secure
- Conserve Energy
- Group; Patternize
- Contrast, Extreme
- Mirroring; Connect

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Gillette in South Africa

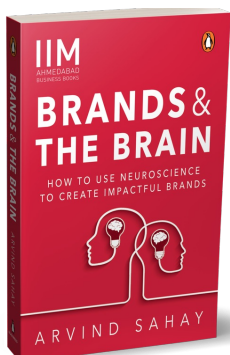
Samsung in India

- <https://www.youtube.com/watch?v=yMwCzdMNfo8>
- <https://martech.org/watched-ad-youtube-2017-spot-samsung-india-services/>

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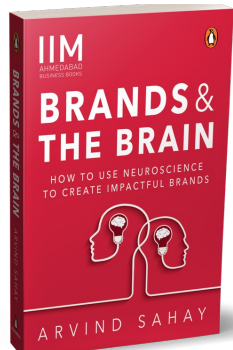
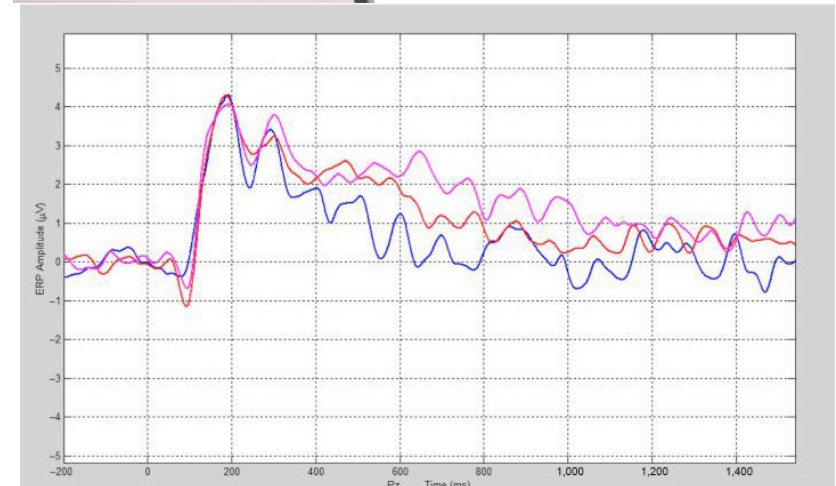
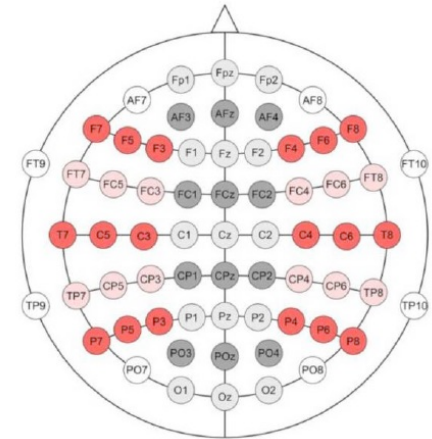
- What are some neuromarketing tools that can be deployed to understand human behavior better?
- At what cost and effectiveness?



Electro-(Magneto-) Encephalography (EEG/EMG)

CONCEPT:

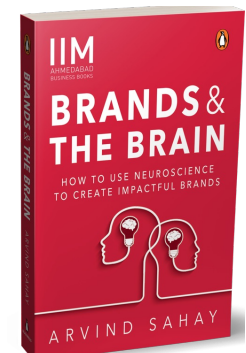
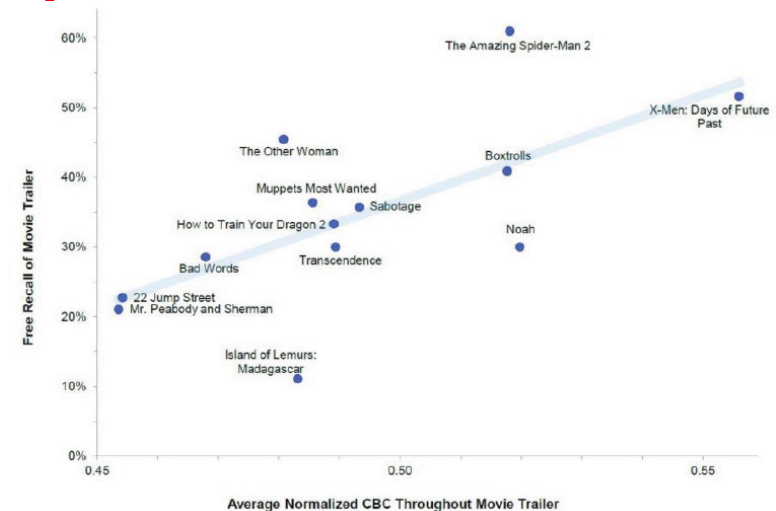
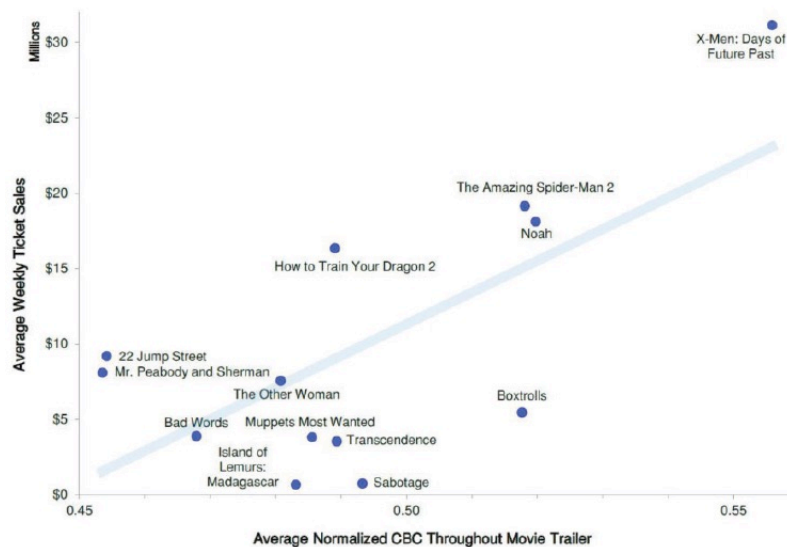
- Electric and Magnetic fields produced by activated neurons.
- Alignment and Simultaneity of activated neurons.
- EEG signal: Amplitude and duration of wave-form
- Signal strength and distance.
- Temporal and Spatial resolution.



Electro-(Magneto-) Encephalography (EEG/EMG)

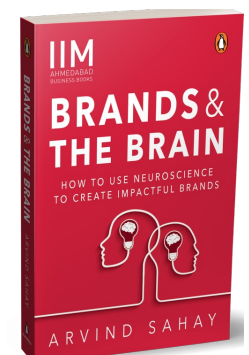
EXAMPLE: Barnett and Cerf (2017)

- Prediction of content recall and sales of Movies, based on EEG activations
- Cross Brain Correlations of EEG activations for different movie trailers



Other Projects

- Completed or in Process
 - Leading Utility Firm
 - OAP
- In pipeline
 - Leading fashion brand
 - Leading bank



Objective

To understand amongst the four pillars:

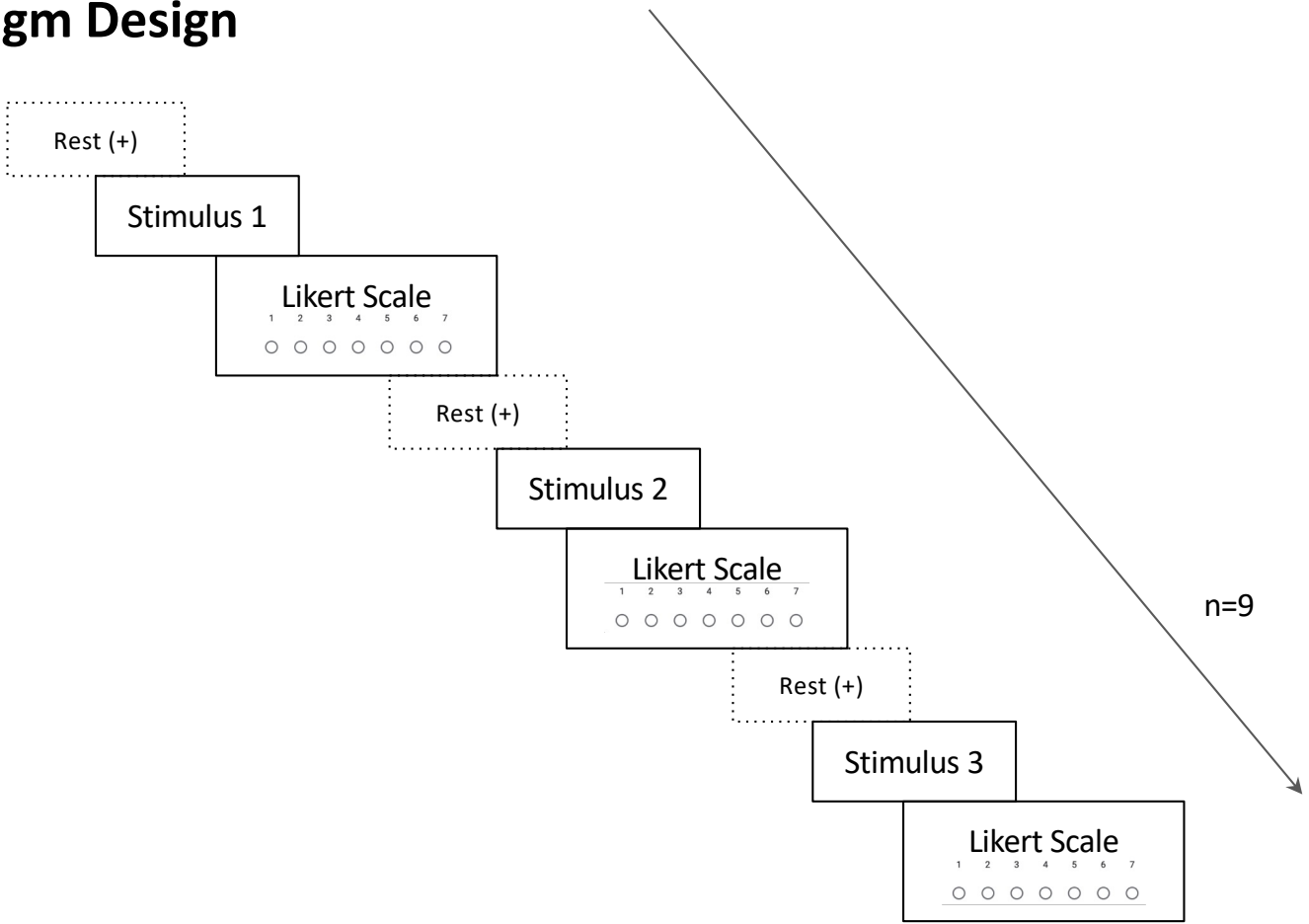
- Oneness
- Growth
- Sustainability
- Opportunity

which pillar is most preferred.

Employee Engagement Pillar Description: Large Utilities Firm

- Company XYZ has a mission of sustainable **growth** with a focus on profitability and market leadership, taking along its key stakeholders and partners. Company XYZ is a key player in the transformation process in a new environment of opportunities arising from liberalization of the sector. Company XYZ has charted out the opportunities, strategy and enablers to **grow** with a capital expenditure plan of Rs 14,000 crore this, out of which, nearly Rs 10,000 crore will be for its renewable business and the balance in improving our power generation and transmission & distribution capacity. Additionally, it is also **setting up** a new 4 GW solar cell and module manufacturing facility, with the investment of nearly Rs 3,000 crore. It has shown a PAT **growth** for 11 consecutive quarters, which is expected to continue given that the operations has improved and stabilised, leading to cost efficiency and multi-fold benefits. Its current financial performance is on the **upswing**:-
- The company is **exponentially scaling up** its renewables business **growth** by aligning to the burgeoning Renewable Energy environment, and pursuing strong opportunities in the transmission sector. Company XYZ has plans to **expand** its distribution footprint across India, leverage technology to expand rooftop solar and solar pumps, and create innovative, low carbon solutions for customers through ESCO, home automation and EV charging, transitioning to become a brand-led, and customer-focused player.

Paradigm Design



Metrics

1. EEG:

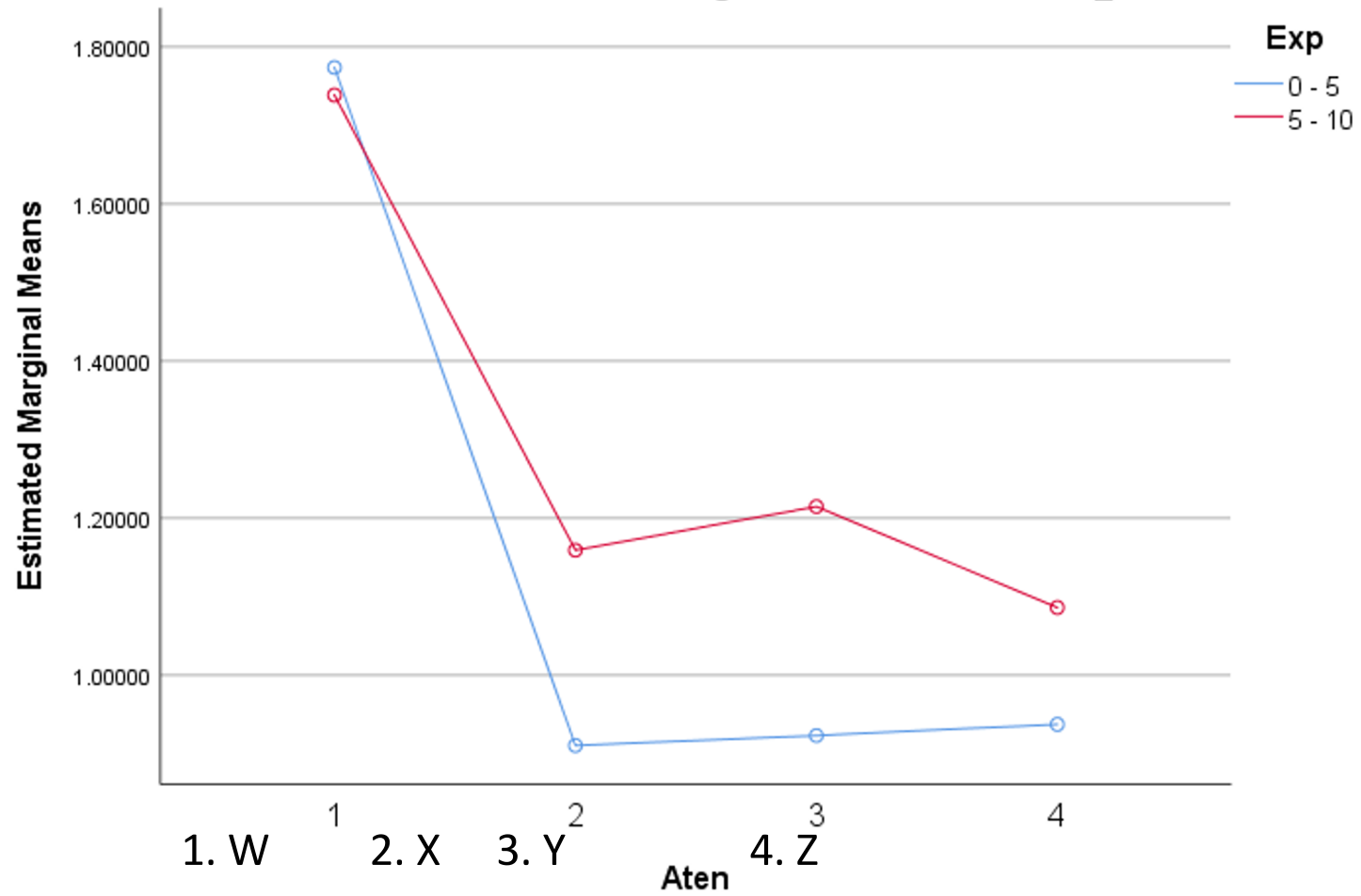
- a. Attention Index
- b. Effort Index
- c. Engagement Index
- d. Approach Withdrawal Index

1. Eye Tracker:

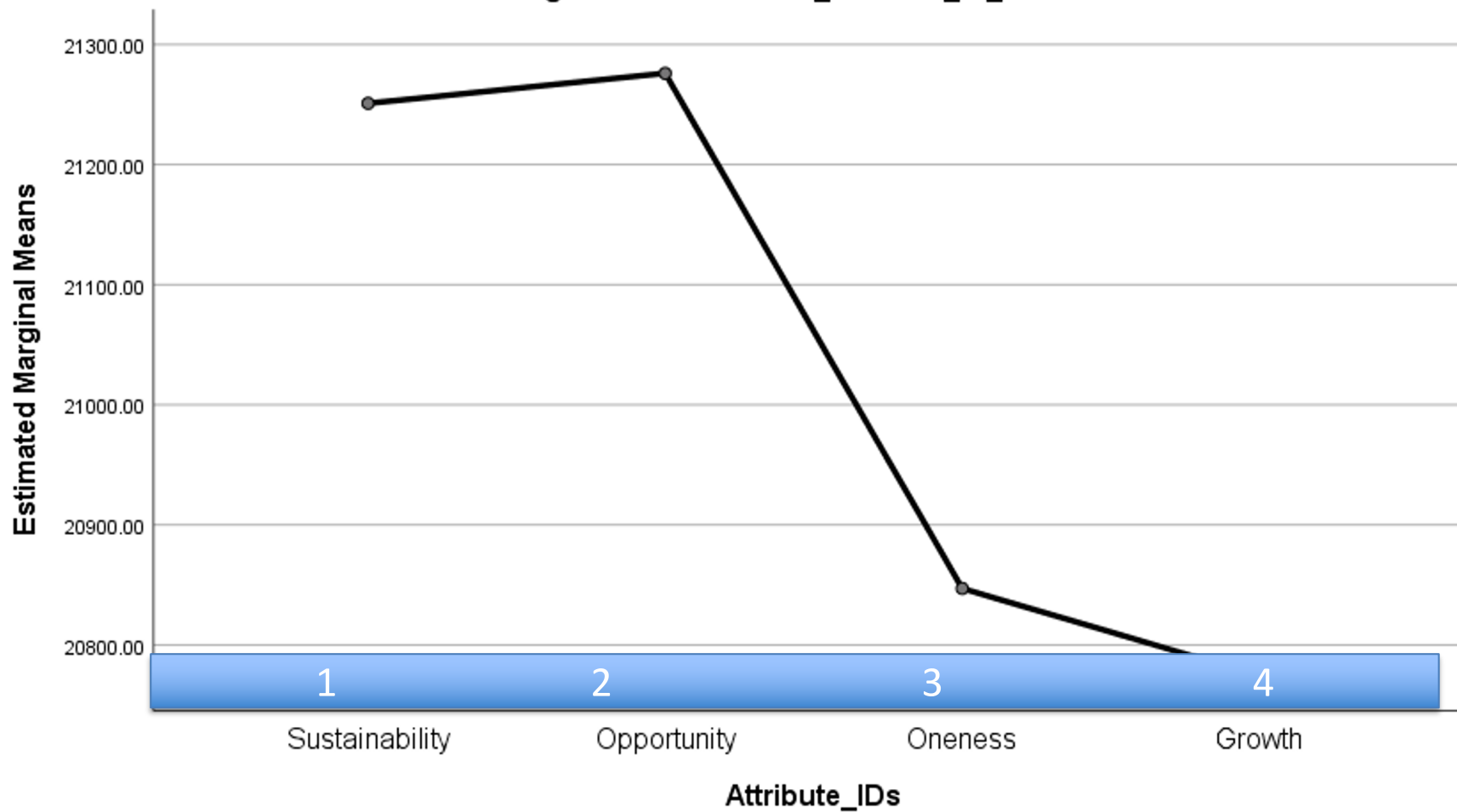
- a. Duration of Fixation
- b. Pupil Diameter

Experience

Estimated Marginal Means of MEASURE_1



Estimated Marginal Means of Total_duration_of_fixations

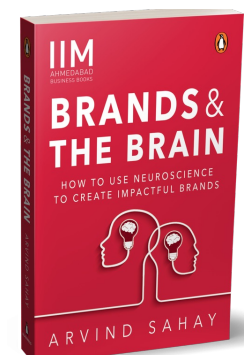


Different Channels of Touching and Creating Customer (and HR) Experience

- Large IT Firm with Global Clients (Based on interviews with "Engagement Managers / Relationship Managers / Client Partners" in Sweden, Denmark, Spain, France, US and UK)
 - F2F – Physical (40%)
 - F2F – Online (35%)
 - Machine to Human; Human to machine (email; chats; videos) (15%)
 - Machine to Machine (5%)
 - Events (5%)

Used in

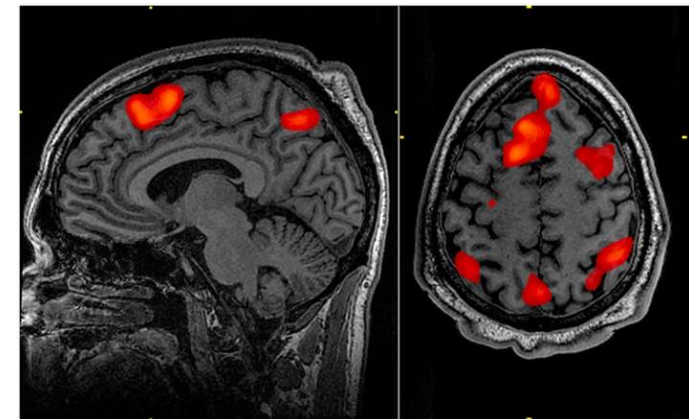
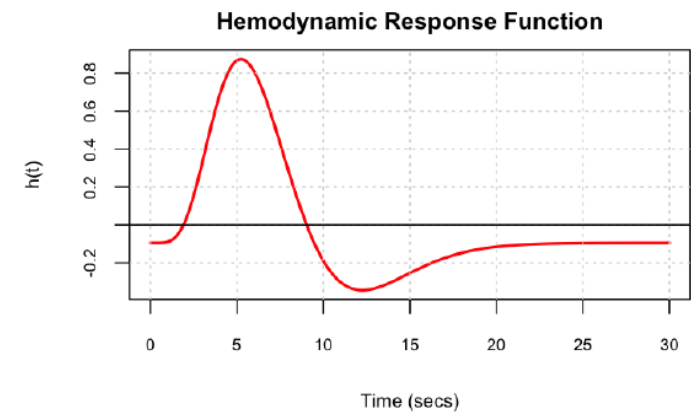
- Advertising and product testing
- Retail format testing
- Reactions to price changes...
- Mapping decision making
- Creating correlation models of stimulus response to understand brand response
- Generating Consumer insights



functional Magnetic Resonance Imaging (fMRI)

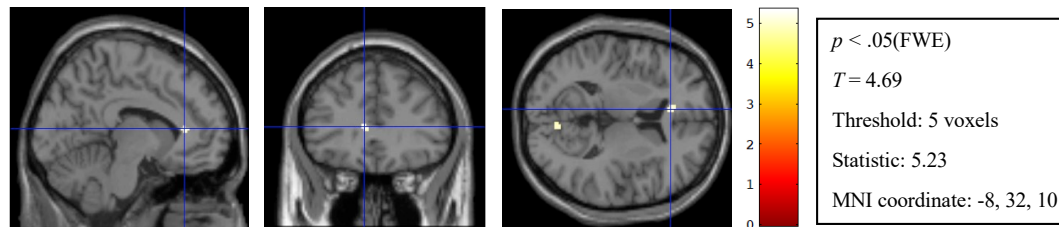
CONCEPT:

- The intuition of fMRI signal generation
- Hemodynamic response
- BOLD signal : oxygenated and deoxygenated Hb
- Correlation between BOLD response and Neural information processing
- Spatial and temporal resolution



What Happens When we Choose “Weaker” Brands: An fMRI study

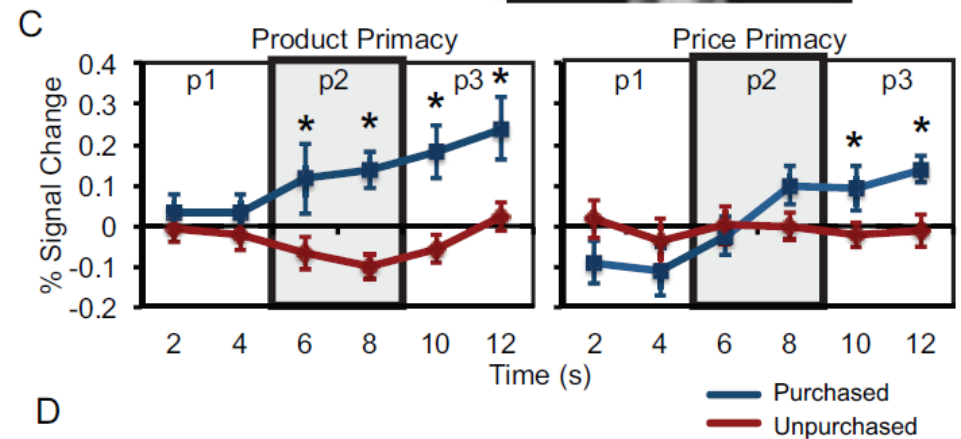
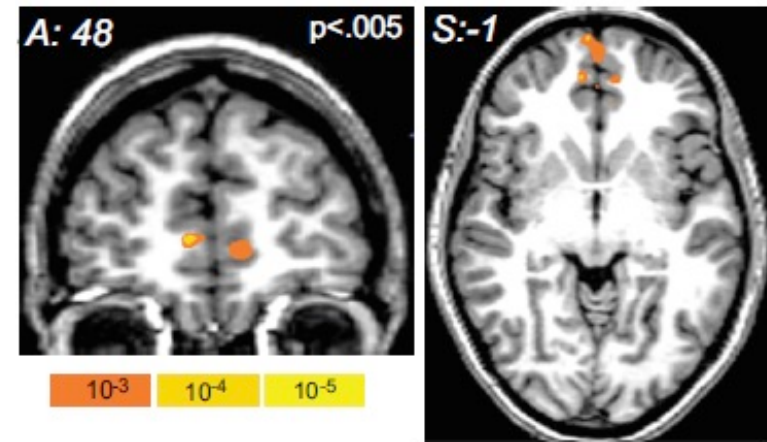
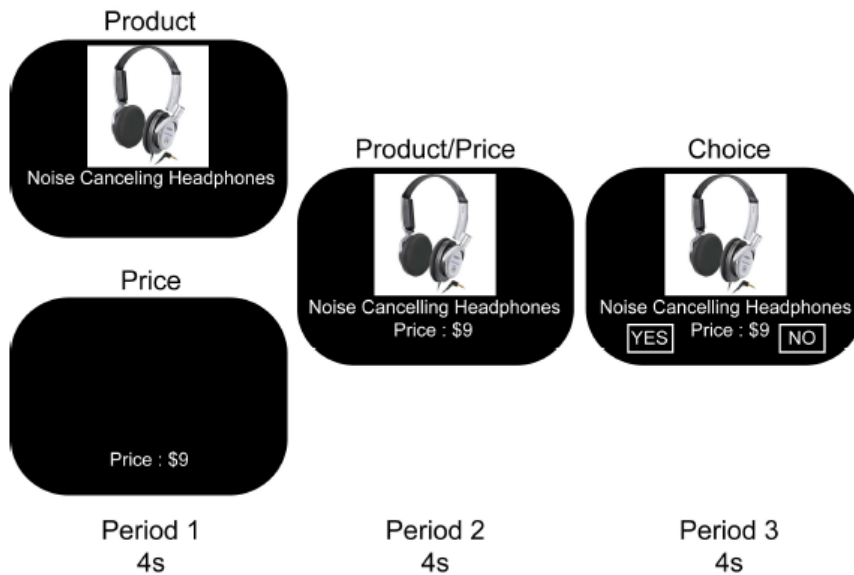
- Through an fMRI study (and related behavioural studies), we found significant activation in Rostral Anterior Cingulate Cortex (ACC), Dorsal ACC and Right Dorsolateral Prefrontal Cortex (DLPFC) for weak brand choices.



Action: Marketing intervention has to help resolve conflict in brain

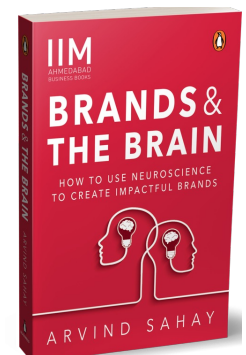
functional Magnetic Resonance Imaging (fMRI)

EXAMPLE: Price-primacy research (Karmarkar, Shiv and Knutson, 2015)



Used in

- Advertising and product testing
- Retail format testing
- Reactions to price changes...
- Mapping decision making
- Creating correlation models of stimulus response to understand brand response
- Motivators of Decisions
- Cause Effect relationships in Brands
- Strength of brand response
- Etc.



Thanks

Questions?

