MKTG30008 L1: Neuromarketing Intro

Learning Objectives
- Explain the unique contribution of neuromarketing approaches for marketing theory and practice
- Explain contemporary marketing and media issues underpinning the growth of neuromarketing research
- Connect and explain the role of the sub-disciplines which contribute to neuromarketing

Managing Marketing Investment Risk
- Marketing investments are risky
  - They are speculative; it is unclear how the market will respond to the investment
  - Predicting and measuring the impact of a marketing investment can be difficult
- Marketing activities can involve multi-million-dollar investments
  - E.g. US Super Bowl advertising - $4.5mil base price per 30 second spot in 2016
    - Why the huge spend? Reaching mass audience
- Varying success rates, often low or unknown
  - E.g. >50% of new product launches fail

Marketing Research Methods

How well can individuals report the influences on their decisions?
- North, Hargreaves and McKendrick (1999)
  - German and French wine brands given equal shelf presence in liquor section of supermarket; German or French music played on alternate days over 2 weeks
  - Consumers who bought either win interviewed at checkout for underlying purchase reasons
    - French/German music days - French outsold German/German outsold French 3:1
    - 1/44 consumers nominated music as purchasing factor
    - 86% ruled out music as an influence on purchase decision

Implicit Decision-Making Influences
- Decision-making influences may operate below the level of awareness
  - These are subconscious influences; we are not aware of these influences as they influence us

Hidden Decision-Making Influences
- Study
  - New orange juice product – supposedly
    - Student recruited supposedly to test a new orange juice product
    - Students ranked drinks depending on how much they liked it, and indicated how much they liked it. The below faces were shown on a screen at the time, subliminally flashing at times during the experiment.

Implicit Drivers of Decision Making
- Winkielman, Berridge and Wilbarger (2005)
  - Subliminal smiles impact on pouring, evaluation and willingness to pay
  - Shifts in behaviour due to hidden influences
  - Heavy bias in ways people are not even aware of
Further Question Marks
- Further question marks on reliability of self-reported decision-making influences
- Clinical neuropsychology studies suggest we create explanations for our behaviour
- The left-brain interpreter:
  - Split-brain research suggests that a built-in neural system (the left-brain interpreter) generates conscious thought processes in response to largely automatic trains of thought that run through mental life (Michael Gazzaniga research)
  - Implications – our conscious thought processes can be an interpretation of conscious thoughts and behaviour driven by subconscious processes
- Memory loss acquired through alcohol abuse (Korsakoff’s syndrome) results in confabulation: imagination in place of memory

Consumer Research Limitations
- Summary of influences that impact on reliability of consumer self-reports
  - Thought processes that occur largely ‘beneath the surface’ influence decisions
  - Awareness/ability to reflect on thought processes that influence behaviour is limited
  - Self-reported influences on decisions may not reflect actual decision factors
- How can we gain consumer insights without being exposed to self-reflection bias.

Neuromarketing Data
- An alternative approach for gaining consumer insights
- Data collected using biometrics or neuroimaging technology may predict consumer response more accurately than conscious/explicit measures (interviews or surveys)
- Falk et al (2010)
  - Behaviour change in response to sunscreen messages predicted more accurately by functional magnetic resonance imaging (fMRI) data than participants’ predictions

Benefits of Neuromarketing Metrics
- Marketing measures derived from neuroscientific methods:
  - May provide a direct measure of consumer response to a stimulus
  - Provide an objective viewpoint on consumer responses
  - Are acquired at the time of exposure to the stimulus rather than post-hoc as in traditional measures
  - Regard explicit consumer viewpoints as additional/secondary response
- Important Caveat: Must be a robust link between observed responses and the psychological process proposed to be driving the observed response!

Marketing Mix Black Holes

<table>
<thead>
<tr>
<th>Promotion</th>
<th>50% of my ads work – which 50%? Why do the ones that work, work?</th>
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<tbody>
<tr>
<td>Product</td>
<td>&gt;50% of my new products fail. Which NPD concept or final version to pursue? How can we trust that what consumers say about our product reflects their actual behaviour?</td>
</tr>
<tr>
<td>Pricing</td>
<td>How do consumers value our product? How do intangible benefits and costs impact on valuation processes? How do we know that the pricing strategy is correct until after the fact?</td>
</tr>
<tr>
<td>Distribution</td>
<td>What impact do psychological processes such as framing have on channel choices?</td>
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<tr>
<td>Brand Equity</td>
<td>How do we measure the influence of the brand on the consumers? How do we incorporate intangible brand factors in brand value?</td>
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So what is neuromarketing?
- Neuromarketing [consumer neuroscience] is the use of theory and tools from the cognitive neurosciences to inform marketing theory, planning and activities
- Theory
  - Cognitive Psychology + Neural Science + Economic & Marketing Theory
- Tools
  - Psychophysiological measures + Neuroimaging technologies

Neuromarketing Toolkit

- Neuromarketing Toolkit 1: Cognitive Neuroscience
  - Biological foundations of mental processes
  - Cognitive Psychology
    - Sensation and Perception
    - Attention
    - Learning and memory
    - Affect (emotion)
  - Neural Science
    - Neurophysiology – how the nervous system works
    - Neuroanatomy – structure of the nervous system

- Neuromarketing Toolkit 2: Neuromarketing/Neuroeconomic Theories
  - Consumer Decision-making
  - Neuromarketing applied to the marketing planning process
  - Brand Management
  - Advertising, Promotion & Media
  - Neuromarketing Ethics

- Neuromarketing Toolkit 3: Psychophysiology
  - Measurement of physiological processes that reflect internal states
  - Psychophysiological Measures
    - Heart Rate/Respiratory Rate
    - Muscle Tension
    - Pupil Dilatation
    - Eye-Tracking
    - Electroencephalogram (EEG)
    - Magnetoencephalogram (MEG)
    - Positron Emission Tomography (PET)
    - Functional Magnetic Resonance Imaging (fMRI)
Why neuromarketing now?

- Contemporary media challenges driving marketers to seek greater connection with more specific target audiences, with greater efficiency, and greater accountability
  - Lackluster performance of traditional metrics in commercial research
  - New measures required to match demands of the new media landscape; e.g., engagement
  - Mainstream awareness of significant authors in neurosciences; e.g., Damasio, Le Doux
  - Dissatisfaction with traditional black box theories originating from economics
  - Need for objective measures
  - Technology availability

Contemporary Media Issues

- The contemporary media landscape is driving an even stronger emphasis on engaging consumers and measuring effectiveness

Recap

- Individuals have limited access to thought processes that influence behaviour
- Neuromarketing research draws on direct and objective measures of neural and physiological processes associated with consumer behaviour
- Neuromarketing research draws on insights from the cognitive neurosciences to provide a deeper understanding of thinking processes underlying consumer behaviour informs marketing theory, practice and research
MKTG30008 L2A: Core Neuro Concepts

Learning Objectives
- Familiarity with concepts of regional brain specialisation functional neural networks, and their implications for marketing theory and research

Tono Tono and Aphasia
- Tono Tono demonstrates a specific type of aphasia – a deficit in language production or comprehension
- An inability to turn thought into words
  - Can arise due to stroke, car accident, brain damage
- Broca’s Aphasia – language production impaired
- Wernicke’s Aphasia – language comprehension impaired

The Modular Brain
- The brain is modular
- Aphasias demonstrate that brain regions tend to be specialised for particular kinds of processing
  - E.g. using language
    ▪ A particular brain region involved in producing speech (Broca’s area)
    ▪ A particular brain region involved in understanding language (Wernicke’s area)

The Connected Brain
- Neural networks support complex behaviour
- Thinking and behaviour results from the action of different brain regions that are functionally connected
  - Connections between specialised brain regions enable complex behaviour (e.g. understanding language and speaking)

Nervous System Components
- Central Nervous System (CNS) – brain and spinal cord
- Peripheral nervous system includes somatic and autonomic nervous systems
- Somatic nervous system connects the brain and spinal cord with the environment

What Makes Up the Nervous System
- Neurons
  - Cells that specialise in sending, receiving and converting electrochemical (electrical/chemical) signals
  - Neurons are the basic information-processing unit of the nervous system.
  - In the brain – generate ‘brain activity’ signals
- Glia
  - Cells that support neurons

Neurons
- Neurons process information by receiving and sending signals
  1. Dendrites receive signals from other neurons
  2. The cell body of the neuron (the soma) generates an ‘all or none’ electrical signal (the action potential)
  3. The Axon sends the electrical signal to other neurons

The Action Potential
- Signals travelling on neurons are electrical
- Neurons are not directly connected, there is a gap between neurons (the synapse)
- The signal passing across the gap between neurons is a chemical signal (neurotransmitters)

Neurotransmitters
- Neurotransmitters: Chemicals that carry neural impulses from one neuron to another
  - Travel across the gap between neurons and make the next neuron more likely (excitatory) or less likely (inhibitory) to fire
- Neurotransmitters support core behaviours (including consumer decision making)
  - E.g. reward value and dopamine
    ▪ The value of rewarding stimuli is signalled by an increase in the neurotransmitter dopamine in brain regions linked with motivation. More dopamine = greater influence of a stimulus on impulsive behaviour
Grey Matter/White Matter

- **Cerebral Cortex**
  - Cortex means ‘shell’
  - A layer of grey matter folded around the outside of the brain
  - Grey colour due to heavy concentration of neuron cell bodies that generate electrical signals ... ‘brain activity’

- **White Matter**
  - Layer beneath the cortex made up mostly of axons – connections between different brain regions

Four Lobes

- **Frontal Lobe**
  - Smell and Taste
  - Thinking and Feeling Decisions after receiving information from other lobes

- **Parietal Lobe**
  - Touch

- **Temporal Lobe**
  - Hearing

- **Occipital Lobe**
  - Vision

Regionalised Processing

- Each sense associated with a specialised brain region
  - The frontal lobe:
    - Integrates outputs from other brain regions
    - Complex processing
  - Many other brain regions perform specialised functions
    - E.g. inferior temporal lobe linked with object categorisation – assigns perceptual objects to categories (what is it?)
    - E.g. Assembling facial features into a face
  - Damage to temporal lobe results in inability to recognise faces

Subcortical Regions

- Subcortical brain regions that lie beneath the outer cortex play critical roles in regulating behaviour – much of this beneath awareness
  - **Limbic System** – regulation of emotions/motivated behaviours
    - Four F’s: fleeing, feeding, fighting and sexual behaviour
  - **Basal Ganglia** – movement control and reward processing

Subcortical regions include the Limbic System and Basal Ganglia.
What is the difference between left and right hemispheres?
- Left and right hemispheres specialise for different types of information
  - Left – high spatial frequency = best suited for detail
  - Right – low spatial frequency = best suited for holistic

What do we know about regional specialisation?
- 1700s – facial features were linked with personality characteristics
- 1758 – Franz Joseph Gall proposed that the brain consisted of distinct ‘organs of thought’ (faculties)
  - According to Gall, development of a specific mental faculty produced an enlargement of the associated brain region and an enlarged bump on the skull over the area
- Phrenology – deducing the existence of personality characteristics from features on the skull

Implications for Marketing?
- For marketers, understanding the role of regional brain specialisation and functional networks in specific cognitive processes provides:
  1. Theoretical Insight
    - Enhance economic theory of decision-making and consumer behaviour theory by examining specific mental processes underlying consumer behaviour
  2. Market Research Insight
    - Examine regional brain responses that underpin consumer behaviour to inform market decision making

Connection to Perceptions
- Implications of regional brain specialisation and functional networks

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**What do we know about regional specialisation? (cont…)**
- Growing appreciation of functional brain networks
- Connections are dynamically activated between specialised brain regions when cooperation required to perform particular types of processing
- Particular patterns of activation are associated with specific mental states
  - E.g. Music listening activates different brain regions depending upon current focus of attention: melody, rhythm, overall form of song, meaning of lyrics, etc.

**Deciding whether to accept or reject an unfair offer**