APPLIED NEUROMARKETING RESEARCH:
EXAMINING DELTA BRAIN WAVES ACTIVITY AS PREDICTOR OF CONSUMER CHOICE

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Over the last twenty years, there has been a consistent and rising interest within the marketing community, in gaining insightful data on consumers’ neurological and biological activities when engaged with marketing content, and during shopping behavior.

Companies such as Coca-Cola, GM, and P&G have invested in consumer research utilizing alternative, novel scientific methods.

Unlike traditional marketing research which relies on conscious self-reports, neuromarketing research methods are designed to obtain neurological and biometric data that can visually demonstrate subconscious consumer activity, in real time.
NEUROMARKETING, DEFINED

• Although there is no official definition of neuromarketing, we can define it as:*

  the application of neuroscience and neuroscientific tools to marketing research

• Consumer neuroscience is the combination of the psychological study of consumer behavior, utilizing neuroscientific tools

• Neuromarketing can be considered the science of ‘Why’
THE ICEBERG PARADOX

Conscious

Traditional Marketing Research

Unconscious

Neuromarketing Research
In the 1960's, noted neuroscientist Dr. Paul D. MacLean proposed what he called Triune Brain Theory (McLean, 1970; McLean & Kral, 1973). Triune brain theory suggests that the human brain is comprised of three layers formed throughout our evolutionary process: new brain, middle-brain, and reptilian brain (or old brain).

- The cerebral cortex is the neo-cortex is the “new brain”
- The temporal lobe or limbic system is a “middle brain” (also known as mammalian brain)
- The innermost structure, or reptilian cortex, which we theoretically share with reptiles

Within this evolutionary crevice of our brain lies our survival instinct, the decision-maker (after all, crocodilians have been quite adept at surviving multiple global extinctions)

This is the so-called “Buy Button” neuromarketers have been researching for over a decade.

1. Neo-cortex: the neomammalian complex, responsible for rational thinking
2. Limbic system: the paleomammalian complex, responsible for emotions
3. Reptilian: the reptilian complex, responsible for decision-making

It has been confirmed in neuroscientific studies, that no brain structure is immune to evolutionary change, thus debunking McLean’s theory (Ledoux, 1998)

So why do neuromarketers insist on using reptilian-brain theory?
SIMILARITIES IN EMBRIOLOGY
“...**Delta** oscillations have the lowest frequency range (<4Hz) and are involved in **motivational processes**. Delta EEG power has been shown to correlate positively with the amplitude of P300 component in ERP studies, which is commonly associated with processes in dopamine reward system.

It indicates that states associated with the necessity to satisfy the **basic biological needs** can be linked with increased delta activity...

“...What is noteworthy is that while alpha is the dominant frequency in adult humans, **theta** dominates in the EEG of **non-human mammals** and **delta** in the **reptilian** EEG.

These findings may indicate that the behavior of reptiles is mainly driven by motivational drives, whereas the behavior of non-human mammals depends more on emotional reactions and emotional learning...”


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• Multiple in-class demonstrations of EEG and Eye-tracking conducted in graduate-level, Neuromarketing courses demonstrated that a predominance of Delta brain waves at key moments of product or brand exposure, can have predictive value in determining consumer choice.

• Each demonstration consisted of four graduate students engaged in a simulated shopping scenario. The participants, simultaneously wearing EEG and Eye-tracking headsets, were instructed to browse through various brands of a particular product category, picking up and inspecting each item.

• On average, 75% of readings demonstrating strong emotional (subconscious) responses in the form of Delta Hz predominance, predicted final consumer choice. However, these in-class demonstrations cannot be considered true experiments, therefore the results are not conclusive.

• The proposed qualitative research study will consist of a non-random, purposeful sample of graduate students using both EEG and Eye-tracking, who will each engage in a controlled, simulated shopping situation, minimizing external variables that may affect and skew product/brand interaction and choice.
IN-CLASS DEMONSTRATIONS: COMBINED EEG & EYE-TRACKING

Test 1: after inspecting each brand of cereal, the first participant was asked to rank each variety, from “Most likely to buy” to “Least likely to buy.” Chocolate Cheerios® was the brand ranked the highest. When analyzing the EEG and eye-tracking data, “slow-wake” Delta Hz were higher at the moment of inspection. Notice the red dot indicating eye-gazing, and the high level of Confidence (gazing-per-microseconds) at 0.89 (top of the screen, blue bars).

Test 3: after inspecting each brand of cereal, the third participant was asked to rank each variety, from “Most likely to buy” to “Least likely to buy.” Cocoa Puffs® was the brand ranked the highest. When analyzing the EEG and eye-tracking data, “slow-wake” Delta Hz were higher at the moment of inspection. Notice the high level of Confidence (gazing-per-microseconds) at 0.94.
IN-CLASS DEMONSTRATIONS: COMBINED EEG & EYE-TRACKING
THANK YOU!