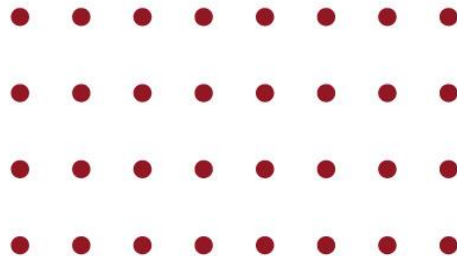


Consumer Experience
in the Digital
Environment

Neuromarketing Research Methods & Implementation Unit 3





Contents

- Common Research Methods of Neuromarketing
- Examples of Studies & Findings
- How to Use Neuromarketing
- The Importance of Eye Tracking
- Eye Tracking Case Study Unilever ad
- Eye Tracking and Website Usability
- Eye Tracking Case Study ASCO website

Common Research Methods of Neuromarketing

Electroencephalography (EEG)

Measures the electrical signals of the brain

Functional Magnetic Resonance Imaging (fMRI)

Detects changes in the oxygen levels of the blood

Eye Tracking

Measures the eye movement

Facial Coding (fEMG)

Analyzes facial expressions

Biometrics

Galvanic skin response (GSR), heart rate

Electroencephalography or EEG

Implementation:

- Electrodes measure electric signals of the brain
- Participants wear helmets and are presented with images or videos of products or services
- Convenient, non-invasive, safe
- Measures quick brain activity due to millisecond temporal resolution

Limitations:

- No difference between positive or negative reactions
- Emotional interferences
- Not as specific as fMRI
- Need a lab

Main Uses:

- Evaluate advertising, product packaging, website
- Assess emotive value, level of attention & involvement, likelihood of remembering



Photo by [Mindfield Biosystems](#) at [Unsplash](#)

Functional Magnetic Resonance Imaging or fMRI

Implementation:

- BOLD (blood oxygen level-dependent) method, analyzes the changes in the oxygenation of blood flowing through the brain
- The fMRI machine creates a powerful magnetic field and radio waves to assess the changes
- Computer converts this information into images of the brain, it's a specific type of magnetic resonance imaging
- Level of engagement, recall, specific emotional response

Limitations:

- Expensive, you need special equipment
- Physically limited

Main Uses:

- Subjective value of brand experience, decision-making
- Response to marketing stimuli like price
- Prediction of consumer behaviour



Photo by [National Cancer Institute](#) at [Unsplash](#)

Eye Tracking

Implementation:

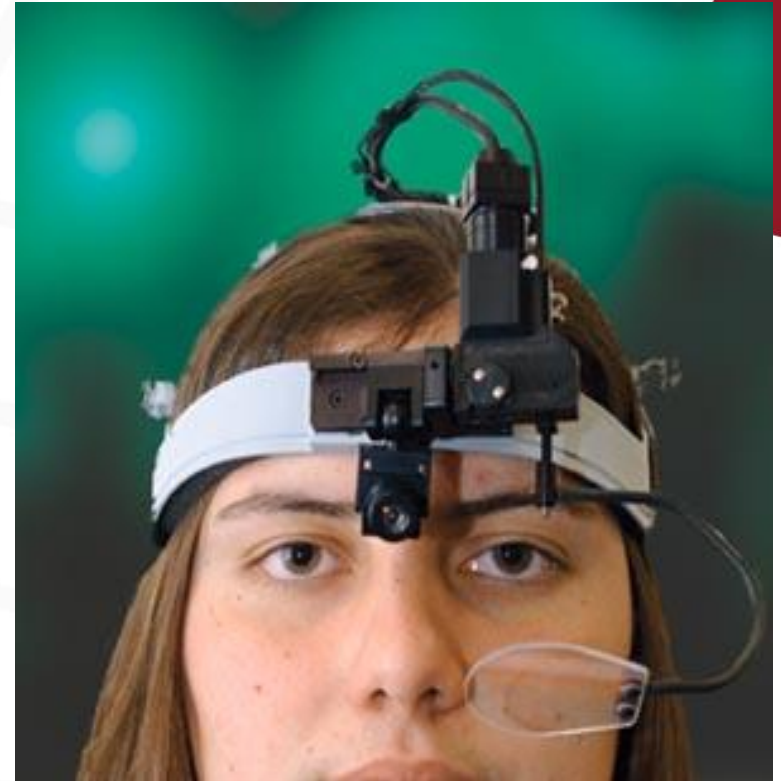
- Measures how long someone looks at something, what they are looking at, how their eyes move, and how often they look at something in response to what they see
- Measurement of the pupil's dilation (pupillometry)
- Use infrared corneal reflection, which measures the distance of the infrared light from the center of the pupil to determine the point of fixation
- Table-mounted devices, head- and eye-tracking cameras with an LCD monitor
- Webcam eye tracking is remote testing, participants use their computers

Limitations:

- No measurement of interferences or emotions
- Best used with biometrics

Main Uses:

- Attention focus at displays of advertisements, stores or websites
- Analysis of website usability & shelf layout and packaging



By Joabro17 at English Wikipedia - Transferred from en.wikipedia to Commons by Liftarn using CommonsHelper., Public Domain,
<https://commons.wikimedia.org/w/index.php?curid=12030808>

Facial Coding

Implementation:

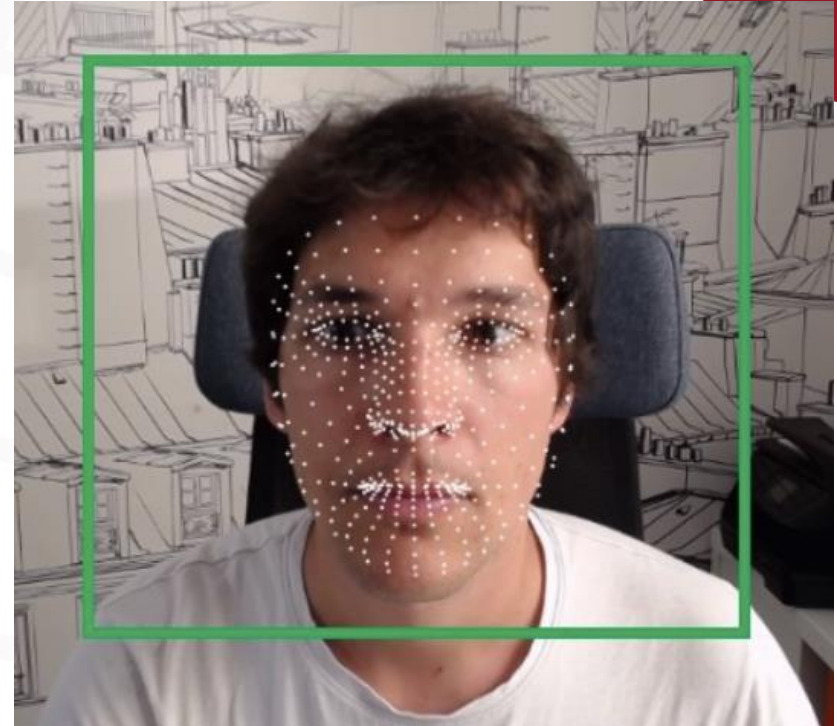
- Measures different facial expressions, was done with electrodes in a lab previously
- Webcams and software map the reactions of the person
- 24 facial muscles identify seven basic emotions

Limitations:

- Before electrodes needed to be applied
- Consent management

Main Uses:

- Measures general emotional response
- Response to marketing stimuli like commercials
- Dynamic tracking of emotional reactions
- Analysis of website usability



<https://www.realeye.io/features/online-webcam-facial-coding/facial-action-coding-system-facs>

Biometrics

Implementation:

- Analyzes galvanic skin response (GSR) and heart rate (ECG)
- Direct monitoring of physical reactions and changes via sensors on devices like smartwatches
- EEGs are also used

Limitations:

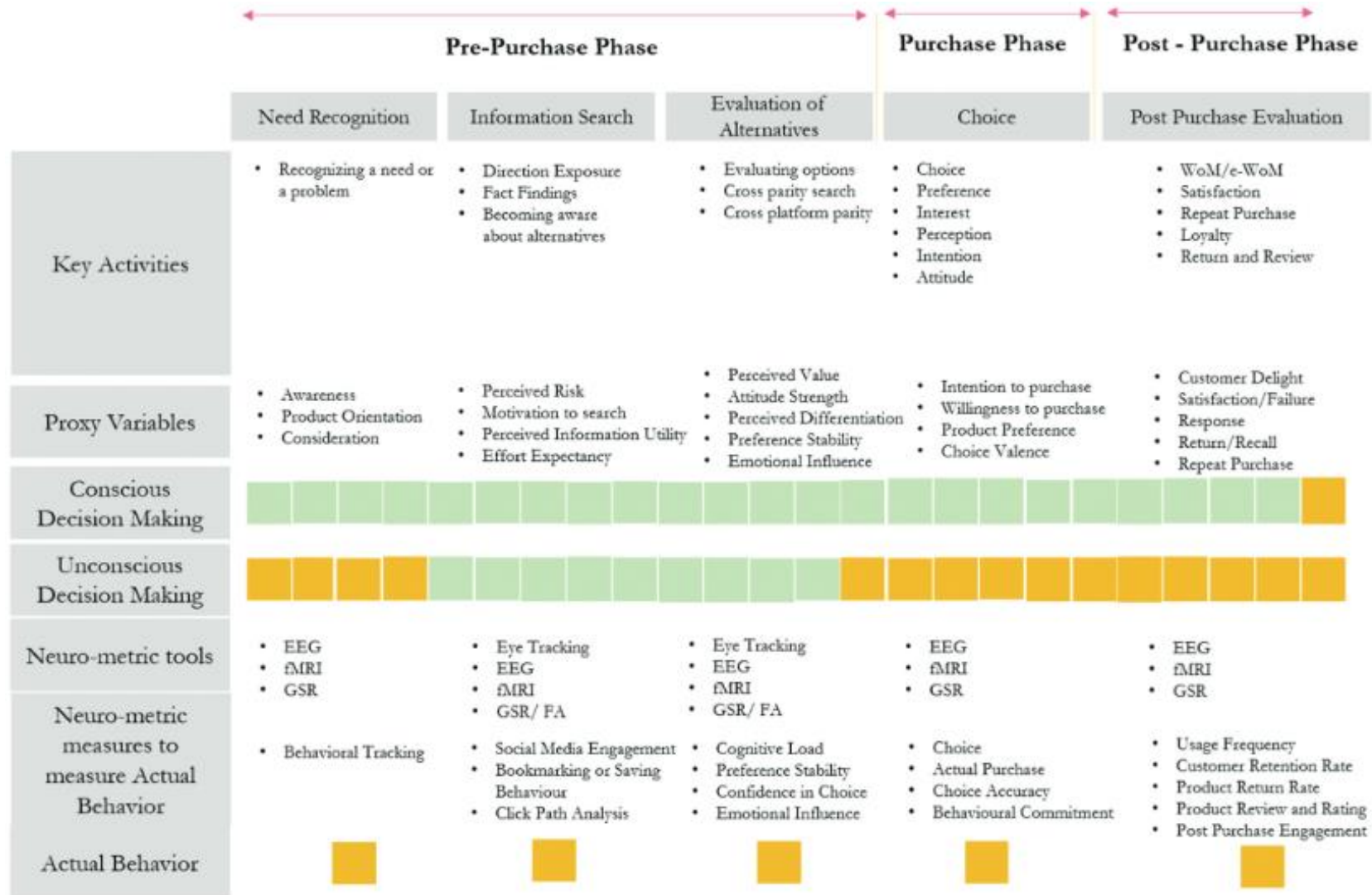
- Expensive
- Specific equipment is needed
- Best used with eye tracking

Main Uses:

- Response to marketing stimuli like commercials
- Dynamic tracking of emotional reactions



Which Tool for Which Shopping Phase?



Gupta, R., Kapoor, A. P., & Verma, H. (2025). Exploring consumer neuroscience in marketing research: theoretical foundations, methodological aspects, and future research directions. *Journal of Marketing Theory & Practice*, 1–27.

<https://doi.org/10.1080/10896679.2025.2493816>

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How to Use Neuromarketing?

- ✓ Consumer & market research
- ✓ Consumer psychology
- ✓ Branding & rebranding
- ✓ Product design testing
- ✓ User experience testing
- ✓ A/B testing to compare the effects of similar ads or website layouts
- ✓ Optimizing a call to action, such as 'Visit our website'
- ✓ Assessing the neural impact of images in an advertisement



Photo by [Towfiqu barbhuiya](#) at [Unsplash](#)

Predicting Preferences

- Berns & Moore did a study on people's music preferences 2012
- They used fMRI scans to measure the outcome
- Participants listened to new online music videoclips
- Compared the results to the popularity of these songs three years later
- They also completed a survey
- The scans were able to show brain areas that were related to buying, and so sales were predicted
- The scans were more reliable than the surveys for the predictions

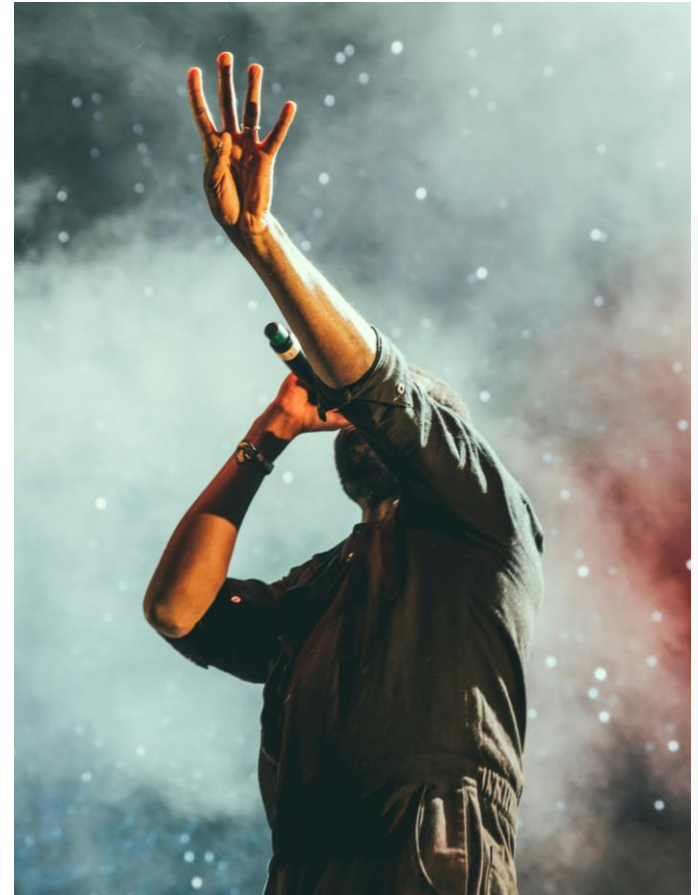
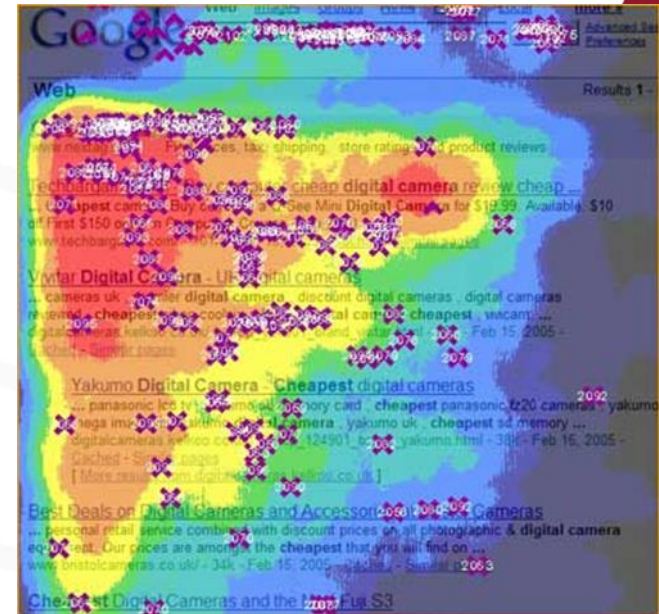


Photo by [Austin Neill](#) at [Unsplash](#)

The Importance of Eye Tracking

- Patterns of fixations and movements across a stimuli like and ad are called scanpaths
- Eye tracking and visual attention are becoming more and more important fields for neuromarketing → accepted knowledge doesn't correctly reflect what goes on in a consumer's mind
- Visual attention is not only a gate through which information enters the mind, gaining and retaining attention isn't easy
- The AIDA model (Attitude-Interest-Desire-Action) is no longer valid per se
- Rizzolatti, Riggio, and Sheliga found out in 1994 that there's a correspondence of eye movements and cognitive processes
- Gaining and retaining attention is difficult, as we are exposed to a lot of visual advertising clutter
- Eye movements are closely related with visual attention, important indicators of the visual attention process



Eye tracking to create a heatmap on the first Google search engine results page

Eye Tracking Case Study: Unilever Laundry Ad

- In 2000 Verify International conducted a study about a full-page print ad of Robyn, a European Unilever liquid laundry detergent brand
- Data was gathered at the eye-tracking facility of Verify
- The design was an “after-only with control group” design
- 115 (initial ad) and 109 (improved ad) regular consumers participated in the study
- The ads which would normally be in a magazine, were presented on 21-inch LCD monitors in full-color bitmaps with a 1,280 × 1,024 pixel resolution
- Participants were using a touch screen
- Infrared corneal reflection methodology was used to track the eye movements, cameras tracked both the position of the eye and head



From the Unilever website, also known as Omo, Skip, Via, Ala and Surf Excel.

Eye Tracking Case Study: Unilever Laundry Ad

- The ad above is the initial ad, with three key regions of interest (ROI), the key ad design objects (brand, text, pictorial)
- There are eye fixations of 115 consumers (50 percent males and 50 percent females) obtained through eye-tracking, superimposed
- Metrics: the Crea-Score (percentage of sample attending the ad in the first ten seconds, a measure of attention retention), Brand Contact (percentage of sample fixating the brand), and Stimulus Performance (percentage of sample fixating brand, text, and pictorial)
- The scores were respectively 40, 48 and 30 percent

Performance Metrics

Crea-Score	40	48	20	46
Brand Contact	48	61	27	83
Stimulus Performance	30	45	50	58

Malhotra, N. (2017). Review of Marketing Research (1st ed.). Routledge. <https://www.perlego.com/book/1579052>



Robyn Test Case Results: Initial Ad (Top) and Improved Ad (Bottom), With Same Editorial Counterpage; Regions of Interest (Rounded Boxes), and Fixation Points Superimposed

Eye Tracking and Website Usability

- Web design has static and dynamic visual features, and requires consumers to engage in search, choice, and perception tasks → ideal for eye tracking research
- Poynter Institute has done the most famous eye tracking study: Eyetrack III, they recorded eye movements of 46 participants who were shown mock news websites and real multimedia content → eyes most often looked to the upper left of the page, only after looking for some time at the upper part of the page did they look down. Headlines had less than a second of a site visitor's attention → need to capture the attention quickly with the main information
- In 2003 Dave and Hussherr conducted a study about a French website with 50 participants. They wanted to find out why banner ads seemed ineffective and how to improve on that. They used eye tracking and a survey. Confirmed the bottom-up space settings and also that users do not pay attention to banners
- In 2002 Josephson and Holmes did a scanpath study with eight participants who saw a portal page, an advertising page, a news story page for 10 seconds. They analyzed the complete sequence of eye fixations across predefined areas of interest. The results confirmed the top-down pattern & some differences



Photo by [Igor Miske](#) at [Unsplash](#)

When to Use Eye Tracking for Website Usability



- Define the research goals clearly
- Gather actionable insights: What type of decisions do I want to be able to make based on the study results?



Bojko, A. (2013). Eye Tracking the User Experience (1st ed.). Rosenfeld Media. <https://www.perlego.com/book/1257094>

When to Use Eye Tracking for Website Usability

For actionable results, you can ask:

Why did the study participants make an incorrect action?

Why did the correct action take longer than expected?

Why did participants fail to extract certain information?

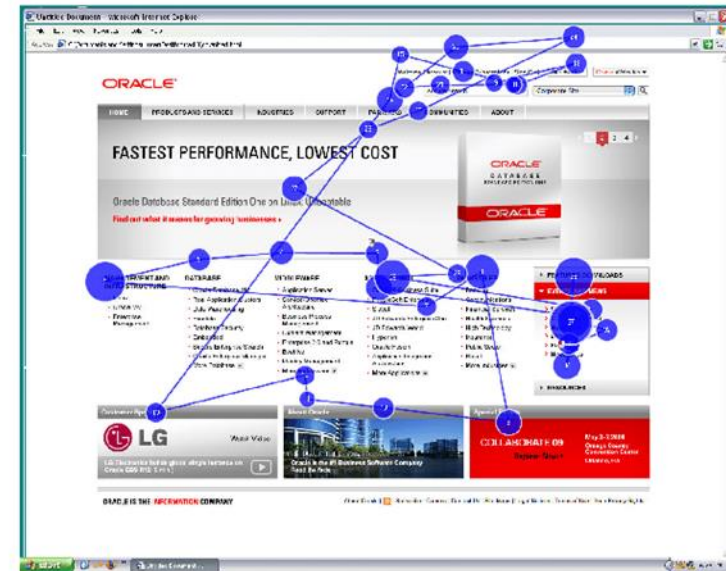


Figure 2. A scanpath from a single observer trying to locate content within the lower right hand area of a web page.

Visual scanpath representation - Scientific Figure on ResearchGate. Available from:
https://www.researchgate.net/figure/Representation-of-scanpath-left-as-a-trace-image-right-by-excluding-fixations-and_fig2_220811069
[accessed 11 Oct 2025]

Eye Tracking and Website Usability: ASCO Case Study

- American Society of Clinical Oncology (ASCO.org) website was redesigned to be more user-friendly
- Study was done to evaluate if the new website made it easier for users to locate the right starting points for key tasks like finding information on the FDA drug approvals, joining, locating the new conferences
- It was conducted at the annual oncologist's conference in 20-minute sessions
- Participants were asked to find ASCO position statements → they located the policy & practice link in the original version, but didn't find it on the new version. Here it was called "practice resources" and wasn't under policy & regulations. Result: Link needed to be moved

Eye Tracking and Website Usability: ASCO Case Study

- For the upcoming conferences, participants were able to find them easier on the new design, because the links were scattered along the left hand side in the original design and concentrated on the upper left in the new one



Bojko, A. (2013). Eye Tracking the User Experience (1st ed.).
Rosenfeld Media. <https://www.perlego.com/book/1257094>

Thank You

