

ALL IN THE MIND?

How neuroscience can help measure the emotional impact of brand image and video engagement

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Essentially, communication is about channelling your message into someone's mind. Businesses spend considerable resources on crafting and broadcasting messages, but how much do we know has gotten into the consumer's head, and how much has just flown past?

Cue neuromarketing. Both an emerging field of academic research and a nascent industry, the goal of neuromarketing is simple: to gain marketing insight through the application of neuroscience. Instead of asking customers to tell us what they think, neuromarketers directly measure how their brains react.

The most common methods to measure brain activity are electroencephalography (EEG) and functional magnetic resonance imaging (fMRI). With EEG, one puts metal electrodes all around the scalp to pick up tiny electrical activities generated by the brain. It is cheaper and easier to deploy than fMRI, but you only get limited signal from the outermost surface of the brain.

With fMRI scanning, a person lies down inside what is effectively a giant magnet; the machine then picks up signals based on the oxygen levels in the blood travelling throughout the brain. When a brain area is activated, it consumes more energy and draws more oxygenated blood. Picking up these blood-flow related signals, researchers can obtain a 3D reconstruction of brain activities in real time.

In the early days of neuromarketing, the most tantalizing prospect of this technology was the ability to locate brain activity that can be linked to a subsequent purchase. In recent years, however, with the latest advances

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in machine learning and data analytics of neuroimaging data, we are not only concerned with whether consumers would buy a product or not, but also with how consumers are experiencing marketing messages at the brain level. The neuroeconomics lab at the Rotterdam School of Management has been at the forefront of this ‘mind-reading’ approach of neuromarketing. In our most recent research projects, we tried to decode consumers’ brains to measure brand images and engagement with marketing content.

Brand image, strength and co-branding suitability

Marketers aim at instilling specific mental associations about their brands into the minds of consumers. For example, a beer brand might try to evoke images of trendy young people at a party, and a cereal brand of a loving family at the breakfast table. So far, so traditional. But the extent to which these images are effectively and consistently forged in the minds of consumers has always been difficult to measure. The best that marketing researchers have been able to do was use tools such as surveys to ask participants to self-report on their emotional reactions to brands. However, brand image surveys require people to verbalise what is essentially an implicit and visual experience (the ‘picture’ the brand generates in a consumer's mind), which may make such measurements unreliable. At the end of the day, many of us are just not very good at reflecting on our internal mental processes. We may not be able to put our feelings into words accurately; asking consumers to reflect may even change the experience itself.

Directly examining mental associations in people's brains, and thereby circumventing the need for self-report, could turn out to be a more reliable way of measurement. We therefore asked ourselves: can we know what consumers think about brands by just looking into their brains? We asked 38 participants to perform a visualisation exercise involving

Brain scans reveal engagement levels of videos



Engaging videos: Similar brains



Non-engaging videos: Disparate brains

Image: RSM Erasmus

Measuring customer experience



Image: RSM Erasmus

Measuring emotional impact with EEG by comparing with previously classified emotions, classification achieved with machine learning technology.

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14 well-known brands, including Apple, Disney, Heineken, Kellogg's, Microsoft and Durex. We asked them to construct a mental picture that best fit the brand's intended imagery and message. Next, we placed the participants in an MRI scanner and asked them to recall the mental images they had constructed while they saw the 14 brand logos.

How do we decode the brain responses of the participants during this brand image visualisation exercise? Here is the twist: after the brand logo task, we also showed participants a set of pictures depicting different social settings: people working in an office, partying with friends, being intimate with a romantic partner, and being with family. We analysed the extent to which activity in the participant's brains while watching the brand logos resembled brain activity while viewing pictures of the social settings. In this way, we

created a neural profile for each brand and participant.

Essentially, these neural profiles indicate to what extent the association with the brand (the 'brand image') resembles the imagery depicted in various social scenes. For example, we found that when participants thought about Heineken, their brain activities were quite similar to how brain reacts to 'party' pictures. Similarly, the image of Kellogg's resembled 'family' and Microsoft was strongly associated with 'work'. Notably, these associations were acquired without us ever asking participants directly what their associations with those brands were. Marketers can flexibly adapt the method to their own market context by selecting types of imagery they deem relevant for assessing brand image.

What's even more interesting, is that brands that have a much stronger image, such

as Heineken, Durex and Disney, evoke similar associations across different participants' brains compared to weaker brands. Furthermore, if two brands' neural profiles are very similar, like Apple and its headphones brand Beats in our study, consumers also told us they would like a co-branded product from these two brands. Therefore, this method could enable marketing communicators to see in advance with which brands they can cross-brand.

Effectiveness of video marketing

In another study, we looked into how our brains process video content. Because more and more firms use storytelling videos to engage their clients, marketers are in need for emotionally engaging video content. The ques-

EXECUTIVE SUMMARY

Neural profiling of brands: Mapping brand image in consumers' brains with visual templates

- Researchers measured brain responses when consumers watched (a) brand logos and (b) pictures in various social contexts
- They then compared the brain responses between the two, and for each brand we compiled a neural profile
- Based on the neural profiles, the researchers found that:
 1. Similar brain responses evoked by two different brands predict their co-branding suitability;
 2. A brand that evoked consistent brain responses across consumers has a stronger brand image.

tion we want to answer is: how do we know if the audience is engaging with the video?

We scanned participants' brains while they watched a set of television commercials and movie trailers. For both types of stimuli, we found that when the video content is more engaging for participants, their brains tend to react in the same way. Moreover, when the brains of consumers react in a similar way such videos were also more memorable. In other words, a potentially viral video evokes similar reactions in the brain ('syncing up' the brains), whereas a less engaging video caused participants' minds to wander and 'tune out', creating disparate brain reactions among viewers.

When we further examine where in the brain we can locate this sync-up effect, an even more interesting finding emerges. It turns out that such effect is localised in brain areas called temporal lobes and cerebellum. These areas are responsible for understanding narratives and emotions. One implication of this discovery is that instead of adding visual stunts such as car chases or explosions, it makes more sense for content creators to make videos more emotionally resonant and narratively accessible.

The future of neuromarketing

The idea of deploying neuromarketing can be both tantalising and disorientating, given past hypes and controversies. In the early era of neuromarketing, findings from neuroscience easily led to overly broad interpretations. More than a decade ago, an op-ed in the New York Times alleged that brain scans revealed people love their smartphones the way they love their spouses; however, despite the eye-catching claim, the evidence did not support that interpretation. Nowadays, with more robust research and advanced data analysis, consumer neuroscience could potentially add actionable insights to existing research methods. For example, we have demonstrated that brain measurements can reveal how consumers feel about brands and engage with video content without them telling us so. As such, we could use brain measurements, for example, to create a moment-by-moment neural readout during a long video, based on which content creators could quickly identify high and low point of audience engagement and optimize their editing.

Currently, costs can be a barrier to employ neuroimaging methods, but there are two reasons to be optimistic. First, the cost for acquiring and operating the equipment necessary for many neuromarketing methods, such as eye-tracking or EEG, is generally trending downwards over the years. More importantly, with the advent of machine learning methods, it is foreseeable in future that a brain-response database can be established as neuroimaging data accumulate, resulting in off-the-shelf 'neural decoders' with minimal calibration needed, thereby making mental content decoding more time and resource efficient.

The mission of better understanding the mind of consumers through neuroimaging methods is still in its infancy. Nevertheless, it is our belief that consumer neuroscience will continue to inform marketing research through innovations and creativity. ●

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