How Marketing Can Trick Our Brains

By Hilke Plassmann , INSEAD Associate Professor of Marketing, and Liane Schmidt , INSEAD Post-Doctoral Fellow

Marketing cues can influence the neurobiology underlying our feelings and behaviour.

People commonly assume there is an airtight boundary between the psychological impression created by marketing campaigns and consumers' actual, empirical experiences of products or services. However, a growing body of research suggests that marketing's influence can co-opt our senses.

A **2008 study** led by Hilke Plassmann used fMRI (functional magnetic resonance imaging) scans to show how the stated price of various wines affected brain activity at the moment of consumption. The price tags presented were deliberately falsified—a $5 wine, for example, was identified as costing $45—yet the drinkers' brains couldn't tell the difference. The price cue, not the objective quality of the product, predicted people's level of

enjoyment.

Researchers call this the marketing placebo effect (MPE)—a behavioural and/or physical change produced by marketing alone, totally separate from the product itself. And it's not limited to wine. **Ziv Carmon** found that people were worse at solving puzzles if they were told they'd consumed a discounted energy drink, as compared to a full-price one. In truth, all participants drank the same beverage. **Pierre Chandon** found that young men who knew that they'd consumed **an alcoholic cocktail laced with Red Bull** reported feeling more inebriated, and acted in a more uninhibited manner, than those who drank the exact same cocktail, but who weren't told that it contained Red Bull.

To delve deeper into how MPE works, we recently revisited the fMRI wine experiment using a newly developed statistical methodology. Our findings have now been compiled in an **article** for *Scientific Reports* (co-authored by Vasilisa Skvortsova of École Normale Supérieure de Paris, Claus Kullen and Bernd Weber of University of Bonn). Specifically, we wanted to know which areas of the brain are most active in translating marketing cues into taste experiences, and thus cause MPE.

An unconventional wine tasting

The wine-tasting part of our study followed the format of its predecessors. Thirty participants—15 women, 15 men—were put inside an fMRI scanner with a tube inserted into their mouths, through which wines were piped, one milliliter at a time. Subjects sampled three red wines in total that they were told cost €3, €6 or €18; all three wines actually retailed for approximately €12 per bottle.

As with the previous studies, the placebo effect predominated in our results. Even when the exact same wine was served with different stated prices, participants said they could taste a difference that corresponded to price difference. The fMRI scans showed that participants' taste ratings were based on an organic response reflected in brain activity, not second-guessing or dissembling.

Earned vs. unearned rewards

The new study builds on past work through the addition of at least three elements designed to illuminate the causal mechanisms of MPE. First, we

asked participants in some trials to pay for each sample of wine with money that they had earlier earned based on their performance in a perceptual learning game. Unbeknownst to the participants, the game was adjusted for skill level so that each participant won the same amount: €45.

In the end, it didn't matter whether the wines were free or participants had to pay the stated price out of pocket. The placebo effect showed up to the same extent in both cases. This finding seems to suggest that indulgences such as luxury goods are not, in fact, sweeter when we feel we've earned them. The pleasure we derive from them appears to be defined more by external cues (e.g. marketing campaigns, brand images, the exclusivity implied by high prices) than by exchange value *per se*.

Where the placebo effect lives

The second additional element in our new study was a multilevel statistical analysis that produced further insight into the neuroscience underlying MPE. We concluded that the BVMS—the brain's valuation and motivation system—is a causal contributor to the placebo effect. The BVMS, composed of the ventromedial prefrontal cortex and the ventral striatum, assigns subjective value to things around us and determines how motivated we are to approach them. The ventral striatum is also known as the motivation centre of the brain, i.e. the brain's chief "dopamine dealer".

In addition to the BVMS, brain areas associated with cognitive regulation—specifically, the anterior prefrontal cortex and the dorsolateral prefrontal cortex—were also seen to play a major role.

More research is needed to ascertain how these regions interact to convert marketing cues into sensory experiences. One possible theory is that the BVMS activates regard for a product's value, as well as blind faith in its desirable qualities, while the cognitive regulation centres choose from an archive of pleasurable memories to crystallise the enjoyment.

Individual sensitivity

The third additional element was a monetary decision-making task designed to activate the BVMS. In a separate part of the experiment, participants were offered the chance to win real money by finding a circle in one out of a varying number of boxes displayed on a screen—the more boxes that appeared, the smaller the chance of winning. We could measure each

player's BVMS sensitivity, i.e. his or her receptivity to monetary rewards, via his or her neural responses to the ups and downs of the game. Of course, the vast majority of us enjoy receiving rewards, but some people's enjoyment is especially intense.

Our findings showed that participants whose BVMS lit up "like a Christmas tree" when they won money also tended to display the strongest placebo effects.

The responsibility of marketers

As marketers refine the customer journey, they could explore ethical ways of leveraging the brain's tendency towards self-fulfilling prophecy. For example, incorporating language or imagery intended to stimulate desire for a reward—*any* reward, not necessarily something tied to a product—may make customers' experience of said product more pleasurable. Presumably, triggering the placebo effect could lead to more favourable word of mouth, online product ratings and reviews, etc.

However, product quality can't be completely ignored. A recent ***Journal of Marketing Research*** study led by Ayelet Gneezy (of University of California San Diego) showed that MPE works only for products of decent quality. With shoddy goods, high prices backfire and the glaring dishonesty draws consumer ire.

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