

A BIAS FOR ACTION

The neuroscience behind the response-driving
power of direct mail. July 31, 2015

Abstract

In today's hyper-digitized world, brands can reach and interact with consumers in more ways than ever. But when it comes to driving action, the end game of all marketing, are all channels created equal?

To find out, Canada Post partnered with leading neuromarketing research and strategy firm True Impact Marketing on a major study – the largest of its kind, in fact. It quantifies the relative effectiveness of physical (direct mail) and digital (email and display) advertising media by way of their impacts on the consumer's brain. Their hypothesis? Direct mail is more action-oriented than digital media because its physical format stimulates the underlying mental processes that guide consumer behaviour.

The researchers focused on the two key indicators of media effectiveness – ease of understanding and persuasiveness – and examined the corresponding brain imaging metrics. Through these tests, direct mail proved the most effective advertising media. It outperformed digital channels consistently – and, in some cases, significantly. These findings suggest that while the digital space provides essential platforms for customer interaction, physical media is better suited to close the marketing-sales loop, or the gap between interaction and action.

Introduction

J.C. Penney is reviving its famous print catalogue. Amazon is venturing into brick and mortar retail. It seems that everywhere, brands are rethinking the role of physical space and media in their customer relationships and business models.

This trend denotes a growing market awareness of evolving consumer behaviour and expectations in a connected world. Shoppers are moving fluidly across on- and offline channels throughout the purchase journey – using information gathered in one to inform decisions in the other – and brands are finding that business success increases significantly when these two worlds connect and feed each other seamlessly. They're re-aligning their marketing mix to this new omnichannel purchase journey – and they're redefining the role and function that each on- and offline channel plays in the mix of customer interactions.

With this marketing mix reset underway, Canada Post set out to understand whether direct mail still holds its own in today's connected world. That is, does its tactile format influence the way consumers interact with and respond to it? Compared with digital channels, how well does it influence consumer behaviour? And what is its role in the new purchase journey?

To answer these questions, they looked beyond traditional market research techniques to the nascent field of neuromarketing, teaming up with the market-leading neuromarketing experts at True Impact Marketing to launch a major study (the largest of its kind) aimed at understanding direct mail and digital advertising's relative impacts on the brain. Their hypothesis? Direct mail is more action-oriented than digital media because its physical format stimulates the underlying mental processes that guide behaviour.

This paper presents the findings of this study and explores how brands can leverage them to get more action from their marketing.

True Impact Marketing was assisted by Thomas Ramsoy, PhD, Senior Researcher and Head of the Decision Neuroscience Research Group at Copenhagen Business School and the Danish Research Centre for Magnetic Resonance (DRCMR).

Methodology

What is neuromarketing?

As its namesake suggests, [neuromarketing](#) is the application of neuroscience to marketing. It draws on neuroscience tools, like brain imaging, to measure consumer responses to marketing stimuli. [Neuroscience](#) is the scientific study of the nervous system (a complex bundle of nerves and specialized cells that transmit signals from the brain to different parts of the body). It is used, among myriad other applications, to better understand human emotions (affective neuroscience), mental processes (cognitive neuroscience), and behaviour (behavioural neuroscience).

Neuromarketing use cases

Neuromarketing taps into the deep-seated physiological response drivers that all marketers look to influence, so its applications are broad and varied. For instance, it's used to optimize retail environments, websites, product packaging, restaurant layouts, menus and advertising messages across media formats.

Neuromarketing's benefits are well-known to big brands. Google uses neuromarketing insights to optimize its search engine algorithm, rewarding websites that have emotionally engaging content and strong visual appeal with the coveted "Page 1" placement. Campbell's refreshed its famous soup label on the basis of neuromarketing research, adding a fresh cloud of steam to the bowl of soup and removing the spoon, which was proven irrelevant to the ad's effectiveness. And PepsiCo's Frito-Lay learned that to appeal to more women, it should avoid using guilt-related statements and focus instead on health messaging.



DEFINITIONS

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[Neuroscience](#) is the scientific study of the nervous system.

Neuromarketing in the spotlight

There's growing interest in the neuromarketing field. "We're seeing a real shift in the way marketers are approaching their work," True Impact Marketing founder and CEO Diana Lucaci says. "Back in the day, marketing was approached as an art. Then the pendulum shifted almost entirely to data and analytics. Now, marketers are starting to see consumers as people with feelings and emotions that drive what they do."

Accelerating competition for consumer attention is also a driver for this growing interest. "Brands want to differentiate themselves," says Lucaci. "And since they can't be everything to everyone, they need to really know their consumer. Neuromarketing provides consumer insights in a way that is deep, accurate and predictive."

Physical and digital stimuli

Two integrated campaigns featuring mock brands were developed for this study – one featuring a high-involvement offer (from a travel agency) and the other featuring a low-involvement offer (from a retailer). The same creative and messaging were applied consistently across physical and digital media formats for each campaign.



Low-involvement offer (Retail)



High-involvement offer (Travel)

The researchers split a sample of 270 participants into nine groups of 30 – one group for each media format tested. Each participant saw two offers (one from each campaign) on a single media format.

The formats below were selected because they are all written, targeted forms of customer communication, and therefore serve comparable marketing objectives.

Direct Mail

Postcard

Envelope

Dimensional Mailer

Envelope + Scent

Dimensional Mailer + Sound

Digital Media

Email – on laptop

Email – on smartphone

Display ad* – on laptop


Display ad – on smartphone

* All display ad formats tested were non-static

Research techniques

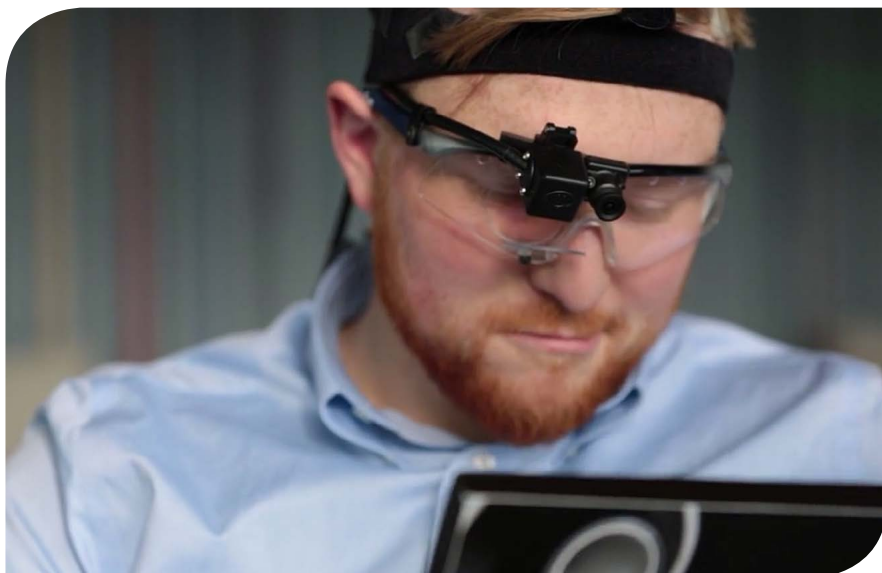
- **Electroencephalography (EEG)** is a brain imaging method that records the brain’s electrical activity at the surface of the scalp using sensors. By evaluating the electrical patterns of their subjects’ brain waves, researchers can assess the intensity of their engagement and whether they exhibit positive or negative emotional responses to a stimulus. For this study, the researchers used the same high-resolution, academic-grade EEG technology as leading universities like Harvard and Yale.
- **Eye tracking** tests measure the gaze and movement of the eyes using a small, specialized camera. This information can help researchers understand how their subject’s attention is being captured by particular experiences or stimuli.

Participants were surveyed before and after they viewed the promotional materials. Both pre- and post-exposure surveys measured stated preferences of various media and interest in promotions. Participants were also given memory tests to assess their brand recall after the exposure.

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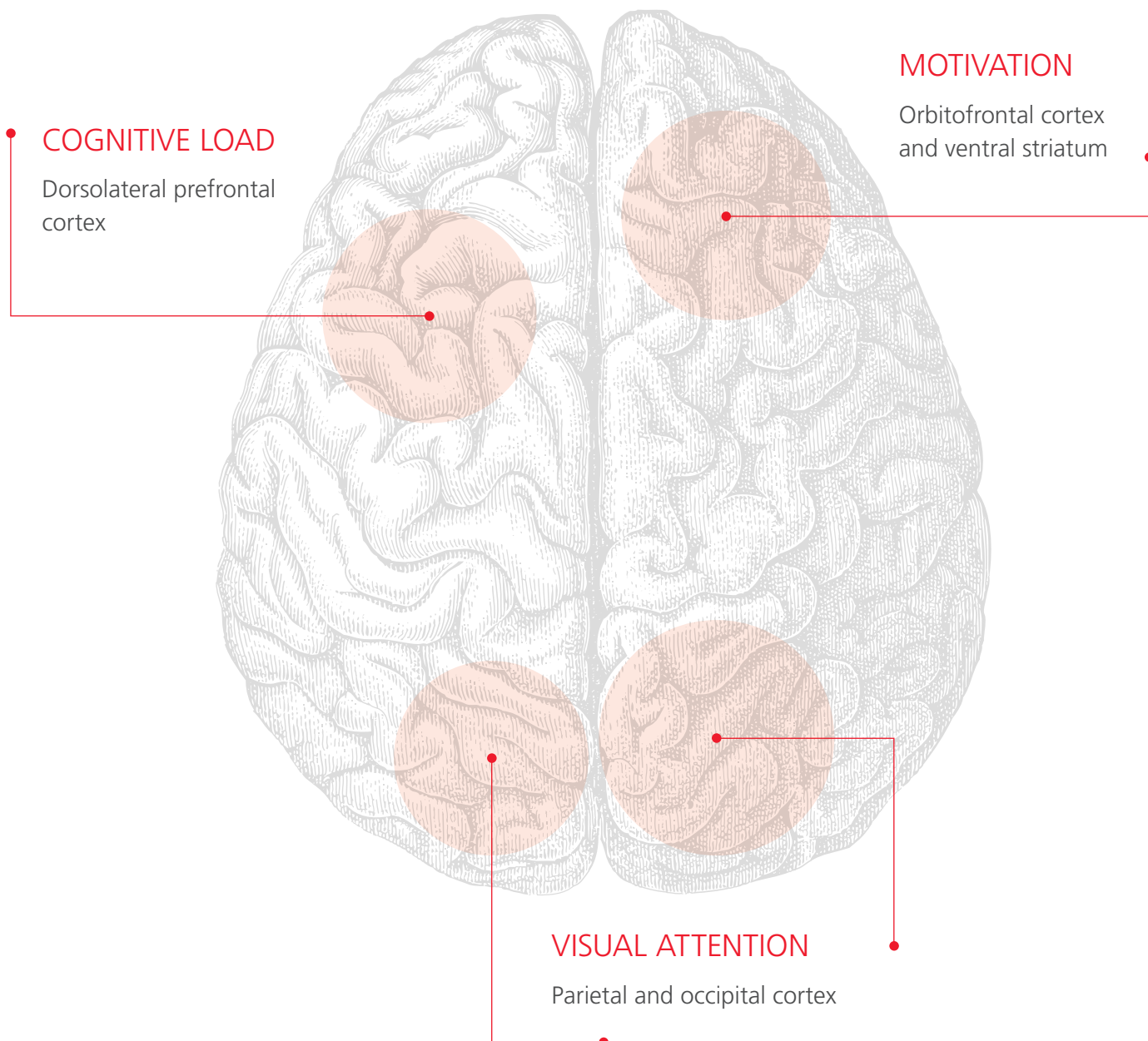
Electroencephalography (EEG) study



Eye tracking test

Brain imaging metrics tested

The study focused on the two key indicators of media effectiveness: ease of understanding and persuasiveness. It examined the brain imaging metrics that correspond with each – *cognitive load* for ease of understanding and *motivation* for persuasiveness. They also looked at participants' *visual attention* to the media presented to gauge how quickly messages were absorbed in each format.



1. Cognitive load

To gauge how easily a message is understood, neuromarketers measure their subject's **cognitive load**, or mental effort required to understand a stimulus. Cognitive load is highly related to working memory performance. "In neuromarketing, we aim for a medium to low cognitive load," explains Lucaci. "This matters because when a message enters the mind easily and makes sense right away, you're much more likely to encode it into memory. That said, we always need to look at cognitive load in the context of motivation. If it's easy to understand but is not motivating, the stimulus is not likely to drive in-market success."



DEFINITIONS

Cognitive load is a measure of the mental effort required to understand a stimulus and is highly related to working memory performance.

A low cognitive load suggests ease of understanding and facilitates memory encoding.

2. Motivation

To understand how persuasive a message is, neuromarketers measure their subject's motivation. **Motivation** is a measure of approach vs. avoidance behaviour*, or the feeling of wanting that drives urges and decision-making. "Within neuroscience, motivation is studied to understand why humans behave the way they do," explains Lucaci. "It provides a lens into the mechanics behind decision-making. That is, before the conscious mind makes a decision, what is the gut reaction? We derive motivation from frontal asymmetry, specifically left vs. right brain activity. Research conducted since the 1970s suggests that stronger frontal left than right brain activation is highly related to approach behaviours, while the opposite asymmetry is related to avoidance behaviours."

Motivation is the only metric that correlates with future behaviour, she says. "When you're drawn to something, you're much more likely to act on it."



DEFINITIONS

Motivation is a measure of approach-avoidance behaviour, or the feeling of "wanting" that drives urges and decision-making.

A high motivation score indicates propensity to pay attention and ultimately drive behaviour.*

* "Driving behaviour" may mean noticing an item among its competitors, seeking out more information, showing a stronger emotional response towards a stimulus, or ultimately making a purchase.

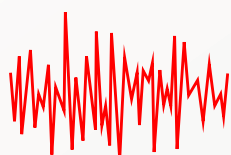
An effective advertisement – that is, an advertisement that drives behaviour – is both persuasive (high motivation) and easy to understand (low cognitive load). Advertisements that yield a **motivation-to-cognitive load ratio** of 1 or higher are considered the most predictive of in-market success (or likely to trigger the desired behaviour from the consumer).



DEFINITIONS

Motivation-to-cognitive load ratio is the relationship between a stimulus’s motivation and cognitive load responses. Stimuli that yield a motivation-to-cognitive load ratio of 1 or higher are considered the most predictive of in-market success.

EEG Brain Waves and Motivation Testing



Beta waves – 15-30 Hz
Excited



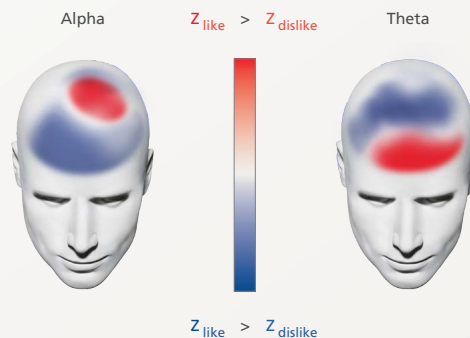
Alpha waves – 9-14 Hz
Alert



Theta waves – 4-8 Hz
Relaxed



Delta waves – 1-3 Hz
Deep sleep




- Frontal right activation (blue) indicates dislike or avoidance tendencies.
- Frontal left activation (red) indicates liking or approach tendencies.

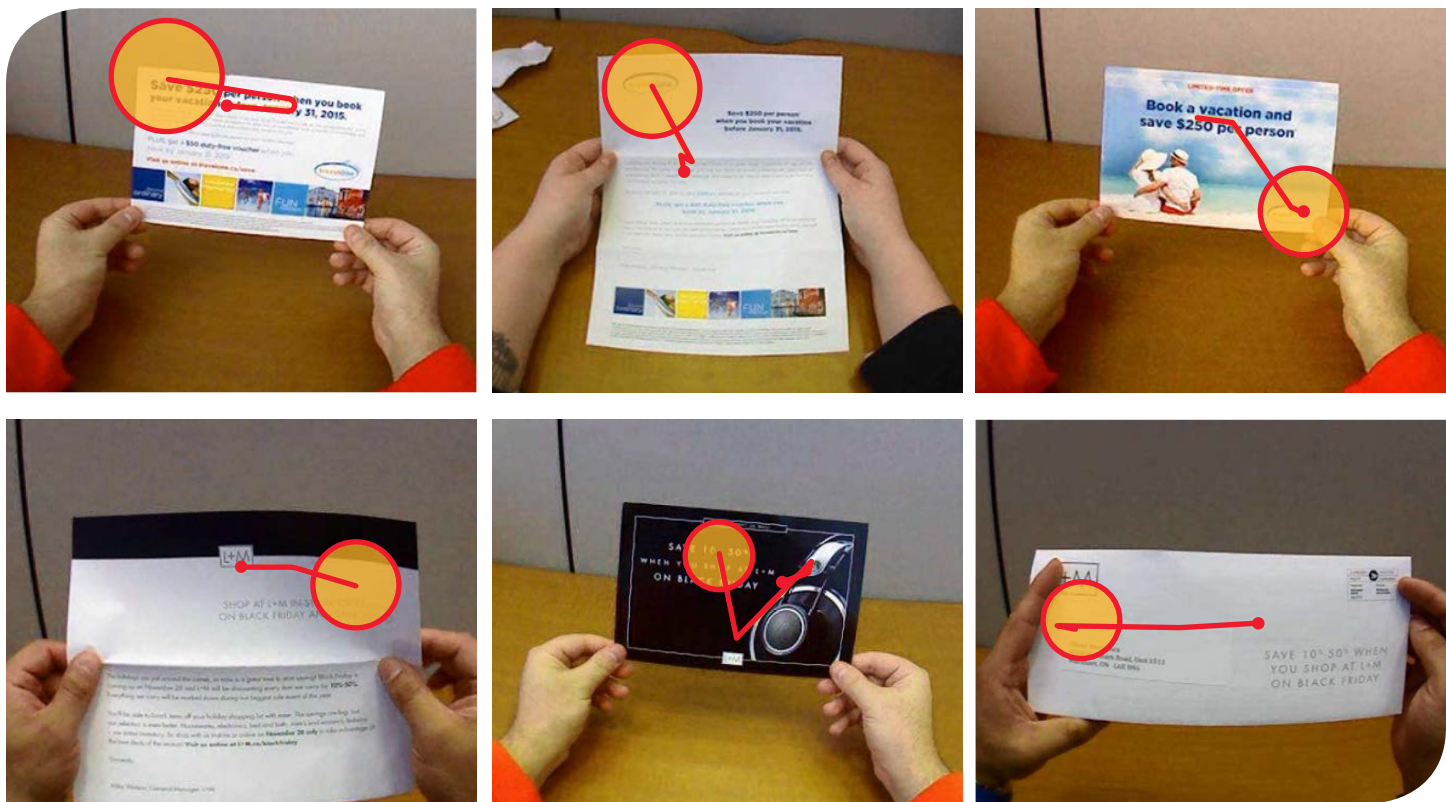
Source: *On the use of the EEG or MEG Brain Imaging Tools in Neuromarketing Research (2011)*

3. Visual attention

The researchers also measured participants' visual attention to the advertisements presented. **Visual attention** is a measure of what the eye is drawn to. "It allows us to pinpoint specific parts of a stimulus that are capturing a person's attention," says Lucaci. When coupled with motivation and cognitive load scores, visual attention can indicate how a person feels about a stimulus and how quickly it is absorbed and understood.

Cognitive load and motivation were measured using EEG, while visual attention was measured by eye tracking.

	DEFINITIONS
<p>Visual attention is a measure of what the eye is drawn to.</p>	



The photographs above were taken during the study as the eye tracking devices measured participants' visual attention to the advertising stimuli, which explains the low resolution.

Deriving motivation and cognitive load scores

To derive the motivation and cognitive load scores, the researchers first determined each participant's "resting state" by conducting a [baseline procedure](#). This involves having the participants play a simple image-sorting task on a laptop in order to promote a neutral, "baseline" state of mind; observing each individual's neural activity above or below this baseline; and standardizing the scores across all participants. This way, a score of 5, for example, is the same for Participants 1, 2, 3, and so on, regardless of their differing resting states.

What makes a good score?

While the criteria for a good or a bad score depend on context, neuromarketing research tends to have a benchmark of:

- 5.2 for motivation (with a standard variation of 0.5); and
- 5.5 for cognitive load (with a standard variation of 0.5).



DEFINITIONS

[Resting state](#) is a subject's state of mind when calm and aware. Studying the brain in this state shows researchers how the active mind works.

[Baseline procedure](#) is a measure of brain activity that occurs when a subject is in resting-state. The 20-minute, shape-sorting baseline procedure conducted for this study was used as a basis for determining heightened emotional states.

Idea in Brief

In today's hyper-digitized world, brands can reach and interact with consumers in more ways than ever. But when it comes to driving action, the end game of all marketing, are all channels created equal?

To find out, Canada Post partnered with leading neuromarketing research and strategy firm True Impact Marketing on a major study that quantified the relative effectiveness of physical (direct mail) and digital (email and display) advertising media by way of their impacts on the consumer's brain. Their hypothesis? Direct mail is more action-oriented than digital media because its physical format stimulates the underlying mental processes that guide behaviour.

Researchers examined the brain imaging metrics that correspond with the two key indicators of media effectiveness – ease of understanding and persuasiveness. To assess the former, they looked at participants' cognitive load (the mental effort required to understand a stimulus); to assess the latter, they looked at their motivation (the feeling of wanting that drives urges and decision-making). The researchers also looked at the relationship between these two metrics (or their motivation-to-cognitive load ratio) to understand the overall effectiveness of each media, with those yielding a ratio of 1 or higher considered the most predictive of behavioural change.

As hypothesized, direct mail is more action-oriented than digital media, surpassing its response across measures:

1

Direct mail is easier to understand and more memorable than digital media

It requires 21% less cognitive effort to process and elicits a much higher brand recall.

2

Direct mail is far more persuasive than digital media

Its motivation response is 20% higher – even more so if it appeals to more senses beyond touch.

3

Direct mail is visually processed quicker than digital media

When considered in concert with its higher motivation and lower cognitive load, this suggests it gets the message across faster.

4

Direct mail is more likely to drive behaviour than digital media

Surpassing the important motivation-to-cognitive load ratio threshold of 1.

Results

This neuromarketing study validated Canada Post's hypothesis that direct mail is more effective at driving consumer action than digital advertising.

1

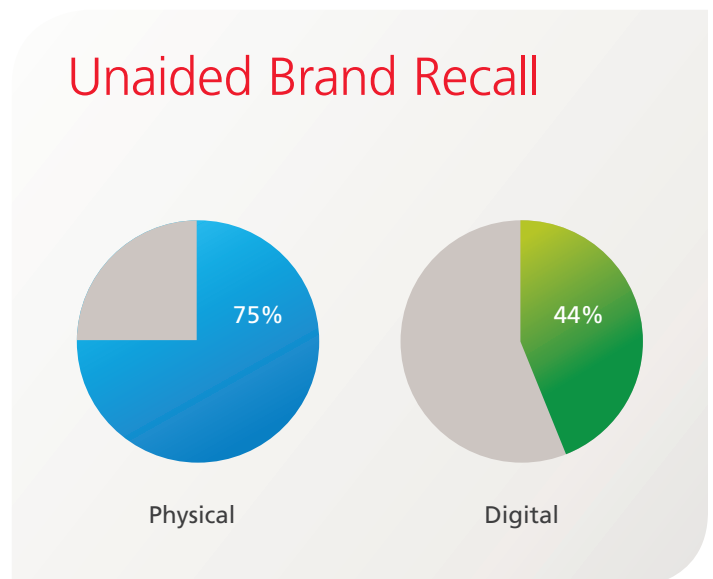
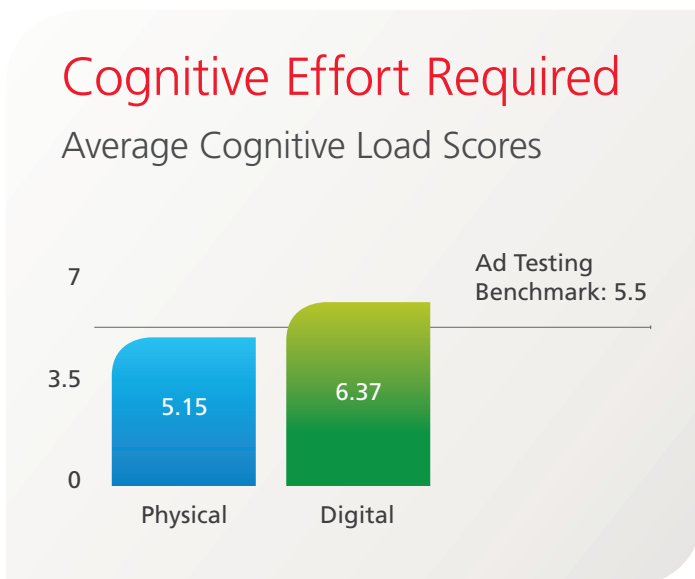
Direct mail
is easier to
understand
and more memorable
than digital media.

It requires 21% less cognitive effort to process and elicits a much higher brand recall.

As explained earlier, cognitive load is a measure of the mental effort required to understand a stimulus and is highly related to working memory performance. The higher the cognitive load score, the more difficult a stimulus is to understand and the less likely it will be remembered.

Direct mail requires 21% less cognitive effort to process than digital media (a score of 5.15 vs. 6.37), suggesting that it is both easier to understand and more memorable.

Post-exposure memory tests validated what the cognitive load test revealed about direct mail's memory encoding capabilities. When asked to cite the brand (company name) of an advertisement they had just seen, participants' recall was 70% higher if they were exposed to a direct mail piece (75%) rather than a digital ad (44%).



2

Direct mail
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Its motivation response is 20% higher – even more so if it appeals to additional senses beyond touch.

Motivation, as discussed earlier, is a measure of approach-avoidance behaviour, or the feeling of wanting that drives urges and decision-making. A high motivation score indicates propensity to pay attention and ultimately drive behaviour.

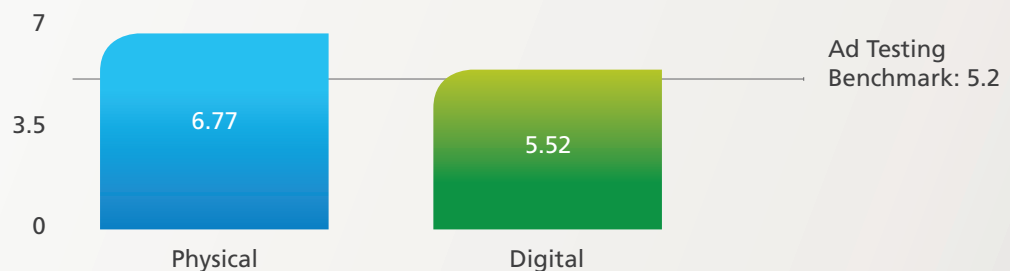
Direct mail's motivation score was 20% higher than digital's score (6.77 vs. 5.52) and 30% higher than the neuromarketing benchmark for motivation (5.2).

"The extent to which physical is motivating was both significant and surprising," says Lucaci. "For motivation, we usually consider a 2% to 5% positive difference to be a predictive indicator of future behavioural change. If, for example, you're choosing between two product packages and one generates a motivation response that is 3% higher than the other, we can confidently say that choosing the package with the higher score will make a positive difference in the marketplace. And the higher the score, the more dramatic the behavioural effect."

"By any standard, a 20% difference in motivation response is very, very big."

Motivation to Act

Average Motivation Scores



Direct mail’s motivation score was even higher when additional sensory features – scent (perfume) or sound effects – were included in the creative. Sensory direct mail outperformed non-sensory (plain) direct mail’s motivation score by 12%, digital media’s motivation score by 30% and the neuromarketing benchmark for motivation by 39%.

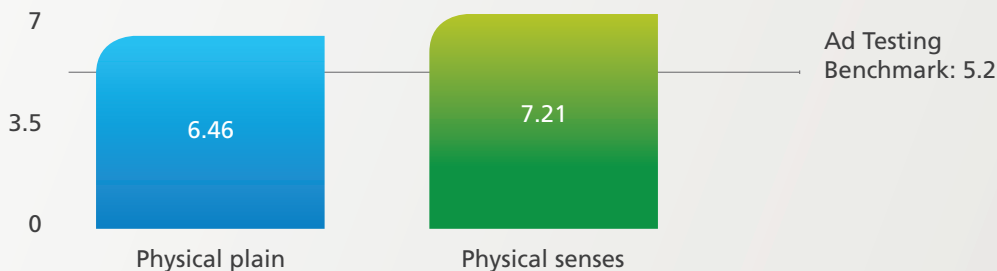
“This is the first study of its kind that integrated additional senses,” says Lucaci. “The extra senses told us a richer story about the brain.”

Lucaci explains that when you’re looking to engage the brain, the more inputs you provide, the more likely you are to be memorable and persuasive. However, she cautions, “adding too many inputs at once can overwhelm the consumer. The key is to add just enough so that the experience is unique and memorable – like when you’re browsing through a store and a good song is playing, or you touch an item and its texture gives you that extra cue you need to make a decision. Sensory stimulation is a proven tactic in retail; a consumer’s likelihood to purchase is in fact correlated with the number of items they touch.”

In this test, the researchers looked at the impact of scent and sound separately. “Scent had a stronger impact on motivation,” says Lucaci, “but unlike the sound, it was not consciously processed. Participants had a better reaction to the piece verbally, but couldn’t pinpoint why. I think that’s really interesting because scent has a tremendous impact on our lives. We expect certain scents in certain places, whether we’re in our homes or at Starbucks. The scent gives us a feeling of being in a certain place at a certain point in time and it allows us to encode the experience into memory much more easily. It affects our whole mood, even though it’s often so subtle that we aren’t aware of it.”

Motivation to Act

Average Motivation Scores



3

Direct mail
is visually
processed
quicker
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When considered in concert with its higher motivation and lower cognitive load, this suggests it gets the message across faster.

The researchers also measured participants' visual attention to the advertising stimuli presented, looking at both the total time, in milliseconds, spent experiencing a stimulus, as well as the average time spent viewing the areas of interest (AOIs) that are most relevant to marketers:

- Price – promotional details related to cost savings;
- Product – images of the product in the offer;
- Logo – logo of mock brand; and
- Social context – images of people interacting, which are processed differently and favoured by the brain.

They added the time spent on AOIs and compared it to the total time spent with each media, and found that while direct mail is experienced in 3.5 seconds overall, the amount of time spent on AOIs was less for direct mail (4.8%) than digital media (7.2%).

Successful marketing campaigns draw the consumer's gaze towards their call to action. However, a longer look does not mean an advertisement is necessarily more effective. That is, a consumer can look at a confusing advertisement for a long time without making sense of it. For this reason, it's considered a best practice in neuromarketing research to pair biometric approaches (like eye tracking) with brain imaging tests for context.

By being visually processed more quickly, having low cognitive load and high motivation scores, direct mail posted results that are optimal.

A higher attentional value can, however, be favourable, as long as it is not paired with high cognitive load and low motivation. This combination suggests the subject is expending time trying to understand the message, with low inclination to act on it.



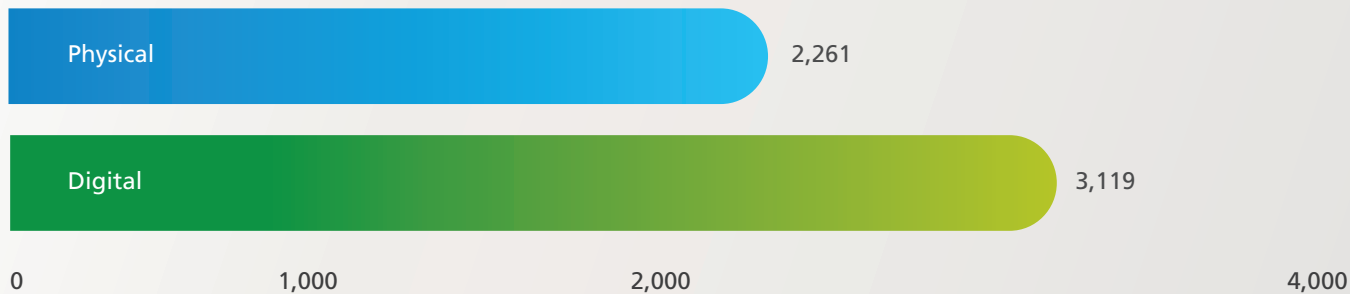
DEFINITIONS

Areas of interest (AOIs) are the visual elements of a stimulus that are considered the most relevant.

Digital media elicited more time on AOs. When considering its higher cognitive load and lower motivation response than direct mail, this suggests that the extra time spent with digital media is not evidence of enjoyment, but rather the need to better understand the message.

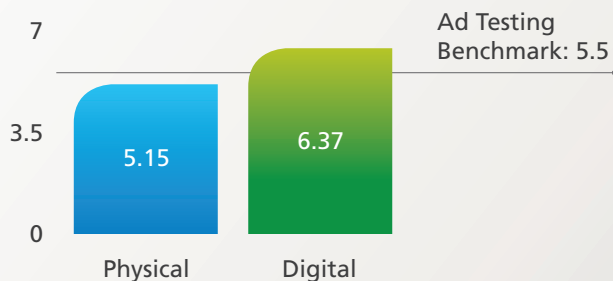
“Digital requires more brain power than direct mail,” Lucaci concludes. “This is a critical point because consumers always prefer the path of least resistance, and direct mail offers exactly that.”

Average Attention on AOs (ms)



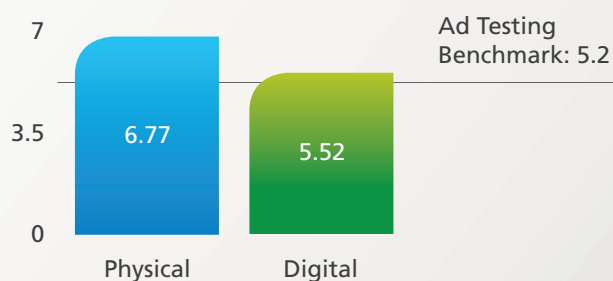
Cognitive Effort Required

Average Cognitive Load Scores



Motivation to Act

Average Motivation Scores



4

Direct mail
is more likely
to drive
behaviour
than digital media.

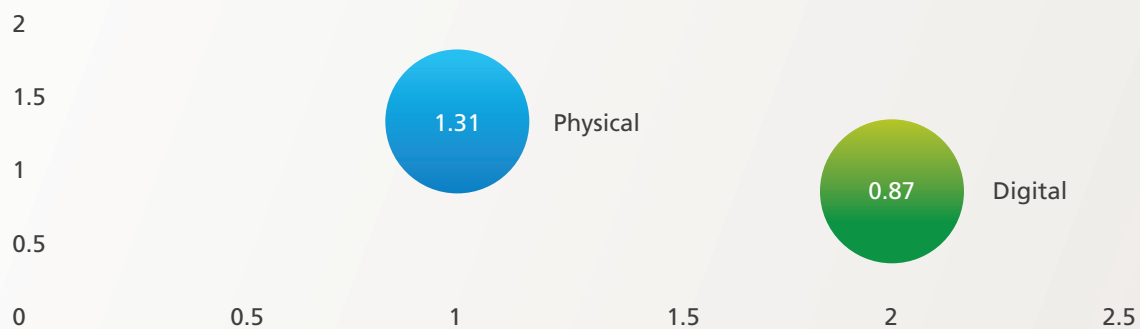
Direct mail surpasses the important motivation-to-cognitive load ratio threshold of 1.

As explained earlier, advertisements that yield a motivation-to-cognitive load ratio of 1 or higher are considered the most predictive of in-market success, or likely to trigger the desired action from the consumer. In this study, only direct mail surpassed this important threshold:

- Direct mail achieved a motivation-to-cognitive load ratio of 1.31;
- Digital media achieved a motivation-to-cognitive load ratio of just 0.87.

Motivation-to-Cognitive Load Ratio

Physical Media vs. Digital Media



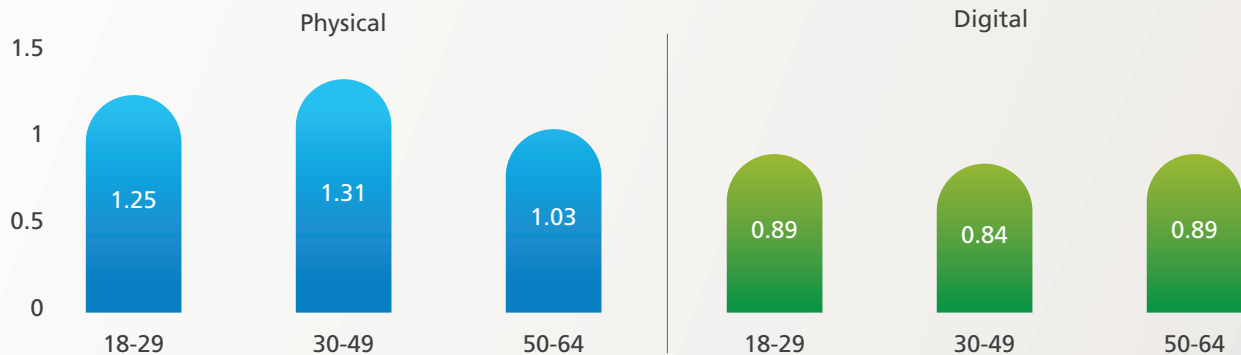
Direct mail outperforms digital media across all age groups

Direct mail's motivation-to-cognitive load ratio exceeded both the threshold and digital media's score across all three age groups tested – 18 to 29, 30 to 49 and 50 to 64 year-olds.

The 30 to 49 year-old group exhibited both the highest response to direct mail (1.31) and the lowest response to digital media (0.84), followed by the 18-to 29-year-olds (1.25 vs. 0.89) and the 50 to 64 year-olds (1.03 vs. 0.89).

Motivation-to-Cognitive Load Ratio - By Age Group

Physical Media vs. Digital Media



The senses reign supreme

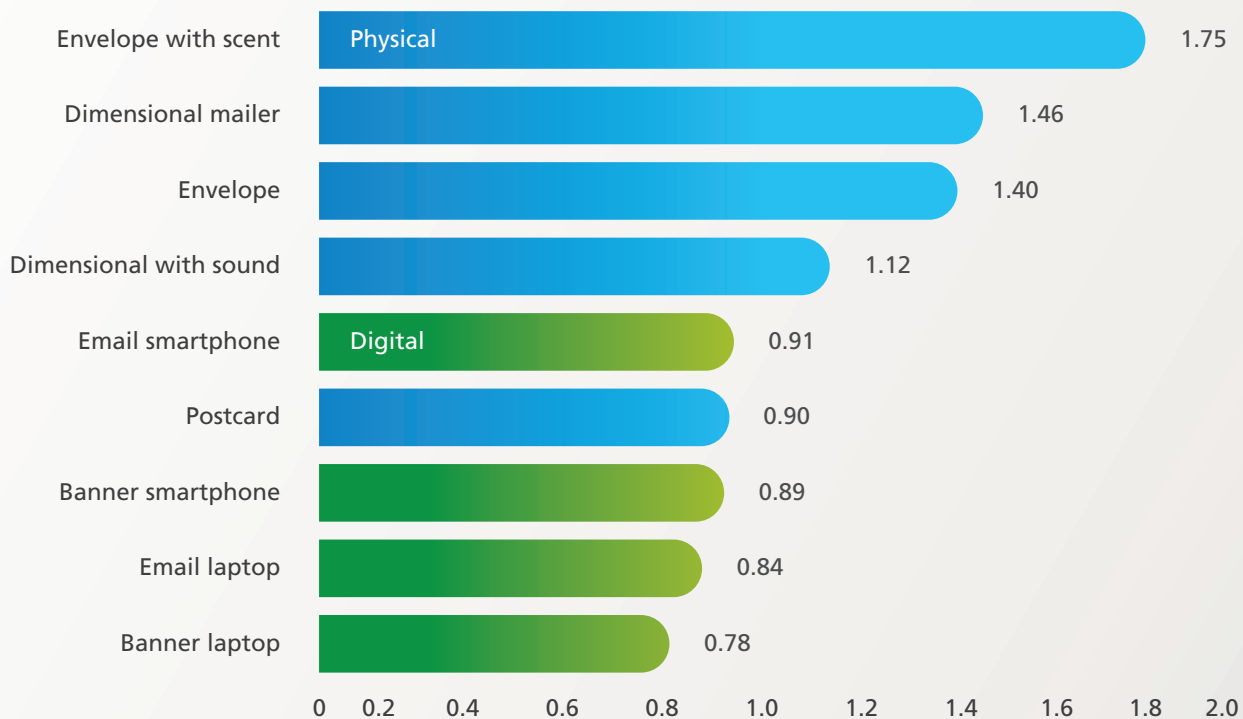
The research proved that direct mail is more effective at driving behaviour, exceeding both the motivation-to-cognitive load threshold of 1 and digital media's score (1.31 vs. 0.87). The researchers also calculated the motivation-to-cognitive load scores for each of the physical and digital media formats tested.

All physical formats exceeded the motivation-to-cognitive load threshold and outperformed digital media, except the postcard. It achieved a motivation-to-cognitive load ratio of 0.90, falling slightly behind email on a smartphone (0.91).

The most effective formats were the envelope with scent (1.75), the dimensional mailer (1.46), the envelope (1.40) and the dimensional mailer with sound (1.12). All of these formats command a high degree of sensory engagement, tactile or otherwise, suggesting that the more a media stimulates the senses, the more effective it is.

Digital media presented on a laptop proved the least engaging.

Motivation-to-Cognitive Load Ratio - By Media Format



Conclusion

These findings suggest a powerful role for direct mail in a connected world.

Consumers are now interacting with brands in a constant, fluid, channel-agnostic way – and digital media provides essential platforms for interaction. But all interaction has an end game: *action*. This hasn't changed. And this neuromarketing study proved that digital under-delivers on this front.

Direct mail, on the other hand, taps into deep-seated neurological processes that trigger action. It also offers the creative versatility to amplify action by appealing to senses beyond touch. It is better suited to close the marketing-sales loop, or the gap between interaction and action.

In a connected world, brands need both interaction and action. Perhaps, then, the secret to smarter marketing lies at the cross-road of physical and digital media. Fusing the two allows marketers to capitalize on the best of both interaction and action to drive customer relationships and sales.

Tweetables

#RethinkPhysical: New neuromarketing study looks inside the brain's response to digital and physical channels – Canada Post

#RethinkPhysical: Want more action from your marketing? Neuroscience suggests adding direct mail to the mix – Canada Post

#RethinkPhysical: Leave your mark. Direct mail is 21% easier to understand and more memorable than digital media – Canada Post

#RethinkPhysical: Looking to drive consumer action? Direct mail is 20% more motivating than digital media – Canada Post

#RethinkPhysical: Will they remember you? Direct mail trumps digital media for brand recall – Canada Post

#RethinkPhysical: Direct mail gets the message across faster than digital media, according to neuromarketing research – Canada Post

Source

Canada Post / True Impact Marketing, *Understanding the Impact of Physical Communications through Neuroscience*, February 2015

True Impact Marketing is Canada's leading Neuromarketing research and strategy firm. The next generation of market research, True Impact offers objective insights about customer emotions and decision-making processes, directly from the powerhouse of emotion: the brain. True Impact fuels marketing confidence. Their solutions for better customer insights improve the marketing equation and provide an industry edge. Using neuroscience and biometrics technologies, they can quantify customer emotion to reveal game-changing business recommendations

True Impact aligns with your marketing and corporate objectives, identifying the gap in customer understanding, and delivering actionable insights of customer emotional engagement. Their technologies include functional Magnetic Resonance Imaging (fMRI), Electroencephalogram (EEG), Eye-Tracking and other biometrics.

True Impact Marketing is a member of the NMSBA, setting the standard for consumer neuroscience research in Canada, and a Winner of the Best in Class Research Award from the MRIA. Learn more at www.trueimpact.ca.



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