

NORDIC REGION'S FIRST
NEUROMARKETING STUDY

Behind the Mind

How the brain reacts to printed
and digital communication

A unique advertising study

The world's first neuromarketing study into printed and digital advertising based on actual brands and real campaigns. This is how it was done.

FOR MANY YEARS, POSTNORD HAS

carried out traditional surveys of consumer attitudes toward printed and digital communication. In April 2016, a step - no, a leap - forward was taken.

It was then that PostNord, in association with Ipsos and Neurons Inc., conducted the first neuromarketing study in the Nordic region: Behind the Mind. 200 people took part, which is considered to represent an extensive study within this methodology. In addition, actual brands and real campaigns were tested for the first time.

Using neuroscientific methods, this study measured how the brain actually responded to different types of communication. The study provides a deeper understanding of the roles that printed and digital communication play in people's day-to-day life - and it may give an indication of where and when the different channels work best. The study offers answers both to how effective printed and digital advertising, respectively, are in different situations, and how printed and digital advertising work in synergy with each other.

What is neuromarketing?

In neuromarketing, neuroscientific methods - for example brain-scanning - are used in marketing, in order to measure how people respond to advertising. Neuroscience is the science of the nervous system - the system that sends signals from the brain to different parts of the body. The science is used in a number of areas to better understand

20,700,000
data points were generated by
brain-scanning during the 200
interviews.

1,656,000
data points were generated by
eye-tracking.

emotions (affective neuroscience), mental processes (cognitive neuroscience) and behaviors (behavioral neuroscience).

Neuroscience examines the deep-lying psychological driving forces in people that marketers want to influence - and the areas of application are multiple. For example, it is used to optimize physical shops, websites, products, restaurants, menus and advertising in a large number of channels. Most of the big brands are aware of its benefits. Google uses findings from neuromarketing to optimize its search engine. Campbell's renewed its familiar soup brand on the basis of neuromarketing; for example, it added steam to and removed the spoon from its images (surveys indicated that it did not make the advertisements more effective).

How the study was done

All 200 interviews were conducted in a home-type environment. The test took around 55 minutes per person. All participants were tested with the aid of eye-track-

ing and brain-scanning techniques. They also underwent a traditional interview.

Tests and tasks

The participants started by answering a web-based questionnaire about 20 brands, including questions about brand knowledge, general attitudes and buying patterns, as well as about attitudes towards printed and digital advertising, respectively. The test equipment was then fitted on the participants, who were asked to perform a number of tasks to enable the equipment to be calibrated and data quality to be assured. This helped the participants to become more comfortable with the equipment, reducing the risk of stress and unreliable results.

The test itself was conducted in several stages and all participants got to see all the campaigns, both printed and digital. However, the specific order was randomized for every participant so that the specific order in which the campaigns were presented would not affect the results.

The survey was concluded with a repeat exposure of the brands, followed by an assessment.

How were the participants selected?

200 people took part in the survey. 100 in Sweden (19-29 April) and 100 in Denmark (15-21 April). The selection was based on the following criteria:

- Age 18-65 years

- Must own a smartphone.
- Must have an e-mail account.
- Must not have "No advertising please" on their mailbox.
- Must not suffer from any disorders that prevent neuroscientific tests (such as brain damage, epilepsy or depression).

Selection of brands and campaigns

The participating brands were:
In Sweden: IKEA, ICA, Panduro Hobby and Lindex.
In Denmark: IKEA, Panduro Hobby, Plantorama and SuperBrugsen.

The object was to create situations that were as realistic as possible to the participants. One extremely important element was the choice of brands and campaigns.

The following criteria had to be met:

- An existing brand and campaign.
- Well-known brands from different sectors
- Different types of campaign. A good mix of printed direct mail (in the form of printed folders and advertising sheets, unaddressed and addressed) and advertising in several different digital channels (such as banners, e-mail and digital folders).

Real campaigns - realistically presented

The campaigns in the survey were presented as realistically as possible. Digital campaigns were judged on the basis of natural behavior, so that if a participant was in the habit of looking at digital advertising on their smartphone, that person received the digital campaigns in the same way in the study; if a participant looked on their computer, it was the same way in the study.

- Printed advertising was packaged in the same way as in the actual campaign. If it was sent out addressed and in a plastic wrapper, that was also the way the participants received the material.
- The mobile phones used were based on the participants' own phones (iOS or Android).
- Banners were shown in authentic surroundings (for example, on a news site).
- Realistic e-mail via Outlook.



ANDREAS DAHL

All participants were tested with the aid of eye-tracking and brain-scanning techniques.



Examples of printed and digital advertising that were tested during the study.

How the results were generated

What was measured?

Cognitive load

Neuro researchers measure people's cognitive load to determine how easily we can take in information. What mental effort is needed for us to understand something?

Cognitive load affects how well our working memory functions. This is important, since if a message is easy for the brain to take in and readily understand, there is a greater chance that we will commit it to memory. At the same time, cognitive load must be seen in relation to motivation (see figure 3). If the message is easy to understand but is not motivational, it is not effective either.

Motivation & arousal

Motivation in neuromarketing is a measure of how convincing a message is. Motivation is a measure of whether people feel that they are attracted to a message or want to avoid it, and whether the message calls a person to act on it. In other words, what does the recipient get as a gut feeling before the brain takes a conscious decision.

Our motivation comes from a frontal

asymmetry, particularly in the "collision" between the activity that takes place in the left- and right-hand sides of our brain. Research since 1970 shows that the more clearly evident activity in the left half of the brain is associated with our being attracted to something. Activity in the other half of the brain is associated with avoidance behavior. Motivation is the only measured value that is linked to future behavior, that is, if you are attracted to something it is much more likely that you will act on it.

Visual attention

Visual attention is a measure of what the eye is attracted to. When this is taken in conjunction with the measurement data from motivation and cognitive load, it may indicate how a person responds to certain stimuli, and how quickly the latter are absorbed and understood.

The "sweet spot"

Cognitive load has a "sweet spot" between 0.55 and 0.75, where information is processed and taken in. Figures below 0.55 are a sign that something is boring, while figures

above 0.75 suggest stress and too much information.

Motivation higher than 0.5 indicates that the recipient is positive and wants to act. Motivation lower than 0.5 indicates that the recipient wants to avoid the message.

Motivation must be viewed in the light of cognitive load. Research has shown that stress and too much information makes it harder to create high motivation.

If the figures for motivation are positive, while at the same time the figures for cognitive load indicate overload, the response is still positive. However, the response could have been better if the cognitive load had been lower. In addition, even if the response had been positive, the cognitive load limits the memory and the ability to reconnect to the message.

Motivation is the most important piece of measurement data. Higher motivation is associated with a more positive feeling and has proved to be a reliable signal for purchasing.

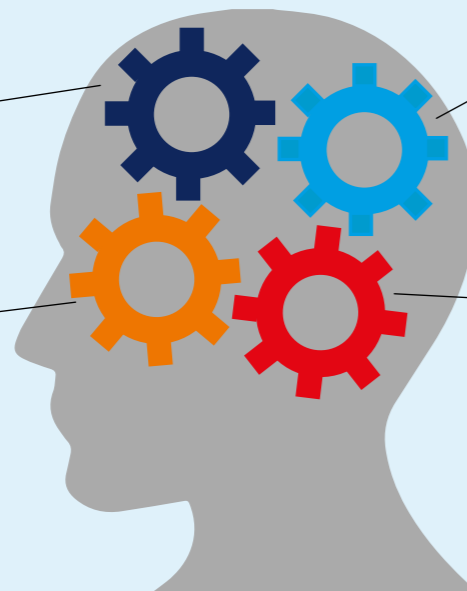
1

COGNITIVE LOAD

Cognitive load affects how easy it is for the brain to take in and quickly understand a message.

MOTIVATION

Motivation is a measure of whether people feel that they are attracted to a message or want to avoid it.



AROUSAL

Is the emotional engagement that a message creates. Both as a whole and through its various constituents.

VISUAL ATTENTION

Visual attention is a measure of what the eye is attracted to.

2

Frontal right activation indicates dislike or avoidance tendencies.

Frontal left activation indicates liking or approach tendencies.



Cognitive load and motivation are measured via brain scanning. Visual attention is measured via eye-tracking.

EFFECTIVE ADVERTISING - in other words, advertising that creates a behavior - is both convincing (high motivation) and easy to understand (low cognitive load). Advertising with a motivation-to-cognitive-load ratio of 1 or higher is regarded as having the best chance of getting the recipient to act on the message.

3

Overload



Cognitive load



Motivation

Positive

Neutral

Negative

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Focus of the study

The following measurements, methods and instruments were used in determining how the participants responded to the advertisement.

ATTENTION: How effective the advertisement and its various elements (for example, the brand, the product, the message) were in attracting attention. Is measured via eye-tracking.

EMOTIONAL ENGAGEMENT: What were the emotional responses to the advertisement, both as a whole and its various

elements (for example, the brand, the product, the message). Is measured via brain scanning.

COGNITIVE LOAD: Was the recipient able to take in all the information in the advertisement or did it become an overload, leading to stress? Is measured via brain scanning.

PREFERENCES: What the participants said that they liked about the advertisement.

Technique

The following technique was used to gather reliable data about emotional and cognitive response.

Eye-tracking

Tobii 2 Pro Glasses were used to measure visual attention and what the participants looked at. The aim was to quantify how long they looked at something and what they missed.

Neuroimaging

An ABM X-10 EEG (electroencephalography system) was used to measure the brain's response.

Traditional survey

The participants were asked to answer questions before and after they were presented with the advertisement that was being analyzed via the study. The aim was to identify preferences for certain media or certain products and messages.

CONCLUSION: 1+1 = 3

A combination of printed and digital advertising delivers the best effect.

Together, the effect is greater than for printed and digital advertising separately. These results are general, that is, they also apply to the youngest groups.

Therefore, the different media categories are mutually supportive. The best effect is achieved by choosing printed advertising first and following up via digital channels.

People can focus more easily on a printed advertisement. In that medium, longer and more detailed messages can be communicated. Printed advertising makes it possible to highlight items in an advertisement and it also arouses more positive feelings. This means that it is possible to start with a printed advertisement to create positive attention, then build on it via digital channels.

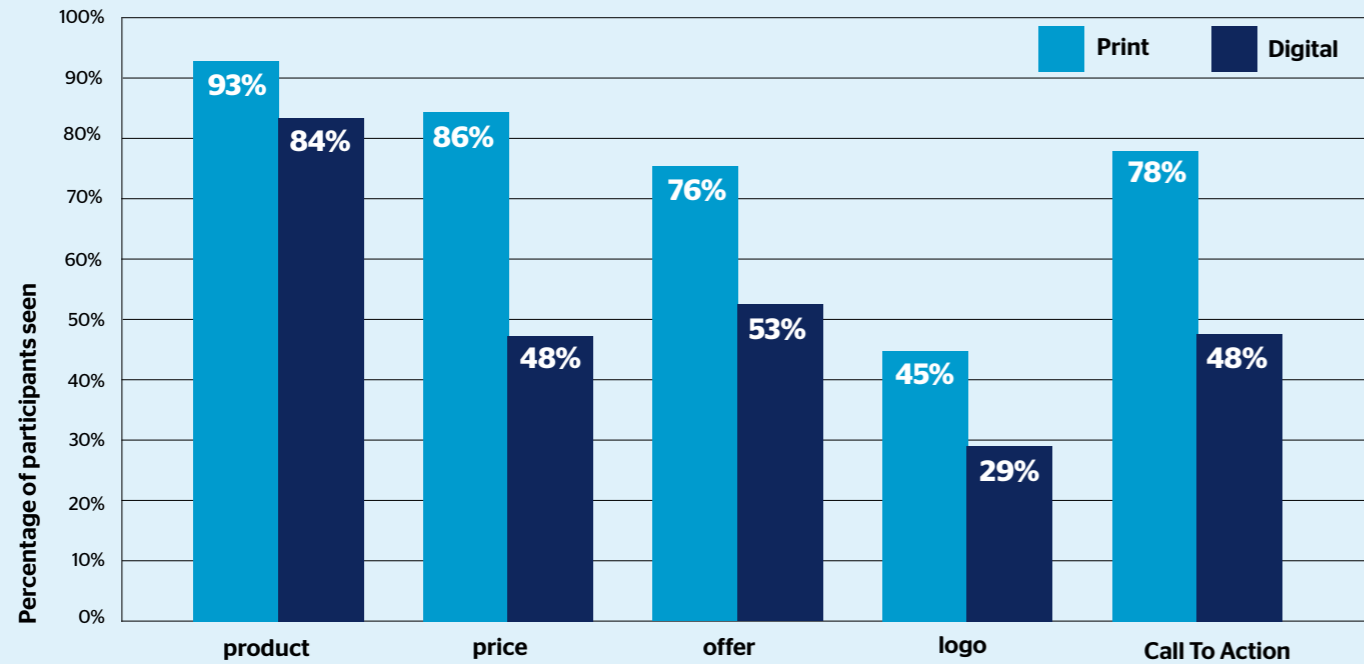
Doing the reverse, that is, starting via digital channels, does not have the same effect.

Digital advertisements create more cognitive load, resulting in the recipient becoming overloaded and failing to notice relevant parts of the advertisement. This also leads to weaker emotional connection to the brand.

As far as strengthening the brand positioning and building positive emotional attachments to the brand, combining digital advertising with printed advertising is important. Digital advertising following on from printed advertising reinforces the impact of the brand communication.

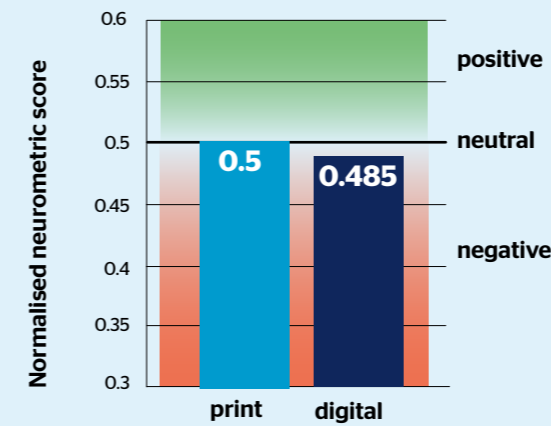
1

% seen

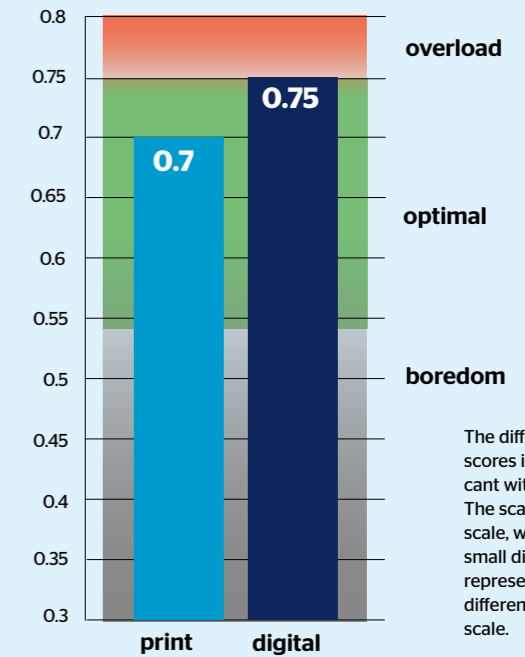


2

Motivation



Cognitive load



The difference between the scores is statistically significant with 99.99% certainty. The scale used is a logarithmic scale, which means that a very small difference observed represents a much bigger difference on a normal linear scale.

Printed advertising generates high attention

Printed advertising generates more attention for all relevant elements of a campaign

Printed channels generate higher attention for all relevant parts of an advertisement and more attention once the advertisement has been seen properly. For digital advertisements, simpler communication is necessary, since the higher cognitive load associated with digital channels is likely to confuse the recipient and draw attention away from relevant information.

Printed advertising generates strong emotional engagement

Printed advertising generates a higher level of emotional engagement and lower cognitive load

Consumers take in communication through various advertising channels in different ways. When printed advertising was compared with digital advertising, it emerged clearly that:

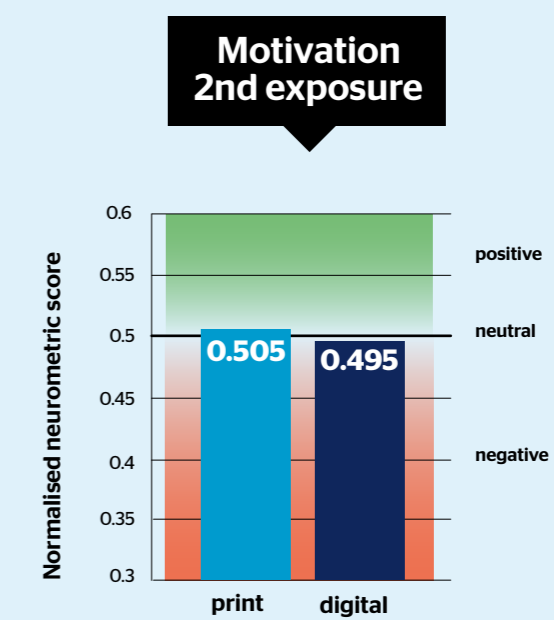
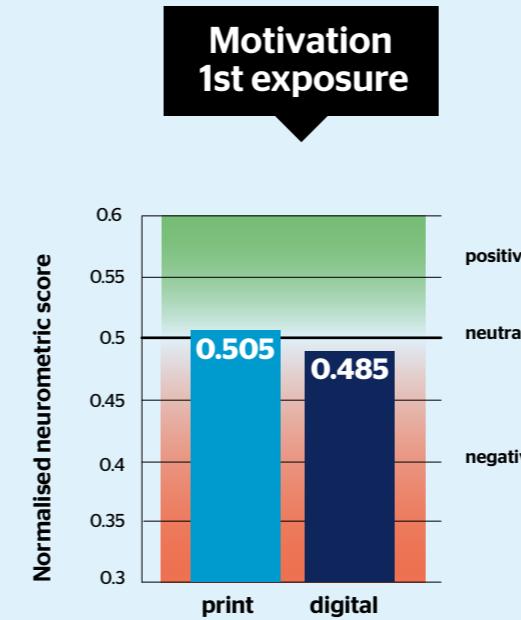
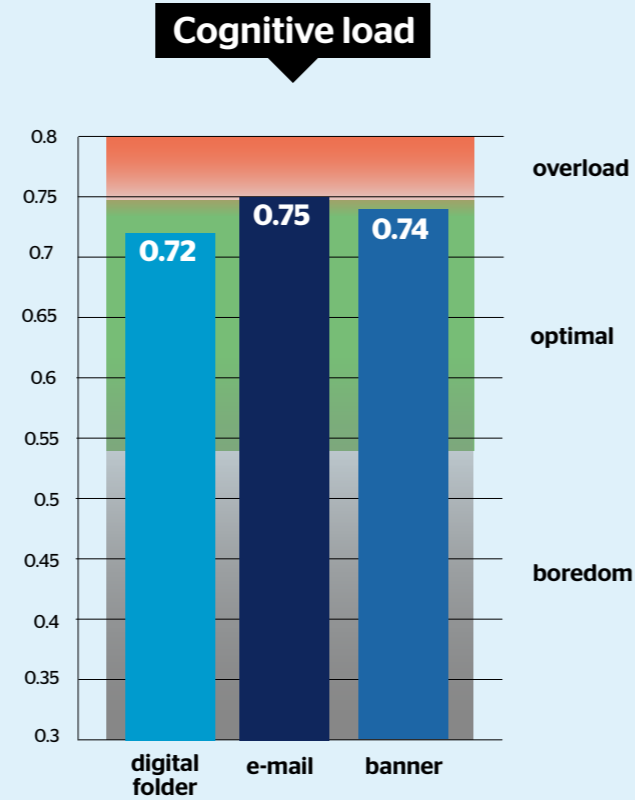
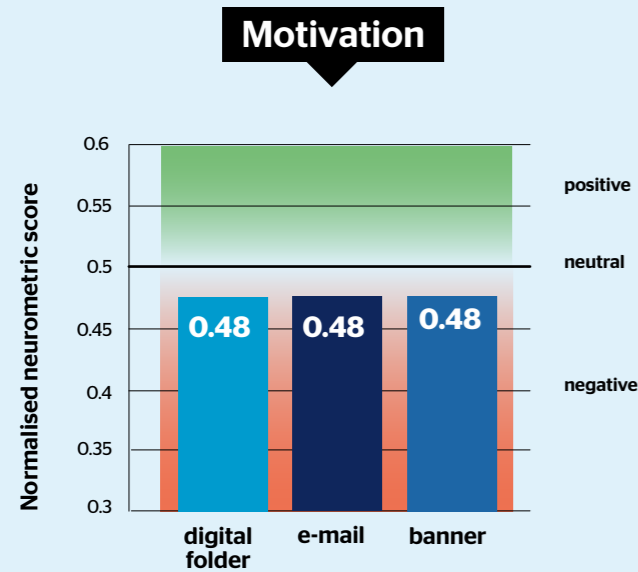
- Printed advertising generates higher emotional engagement with more positive feelings
- Printed advertising generates a lower cognitive load

This is a result in line with other surveys, but the conclusions are underpinned by the fact that these are now real campaigns and actual brands and not fictional ones, as in earlier studies. Digital advertising is associated with a greater cognitive load, which in turn leads to lower engagement and response to advertising messages.

CONCLUSION

3

The difference between the scores is statistically significant with 99.99% certainty. The scale used is a logarithmic scale, which means that a very small difference observed represents a much bigger difference on a normal linear scale.



CONCLUSION

4

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Digital advertising is stressful

Digital advertising generates higher cognitive load, which makes a positive emotional response more difficult

All three digital channels - digital folder, e-mail, banners - tested in this study showed a negative emotional response, probably as a result of increased cognitive load. E-mail and banners in particular were perceived as stressful.

This underlines the importance of simplifying the digital communication in order to prevent consumers perceiving that they are being flooded with information. Earlier studies by the neuroscience company Neurons have indicated that digital channels broadly generate higher cognitive load, leading to a lower level of emotional engagement.

Printed advertising supports digital advertising

Printed advertising increases attention and the emotional response to digital advertising

When digital advertising follows after printed advertising, it creates a stronger emotional response and higher attention to relevant elements in the advertising campaign.

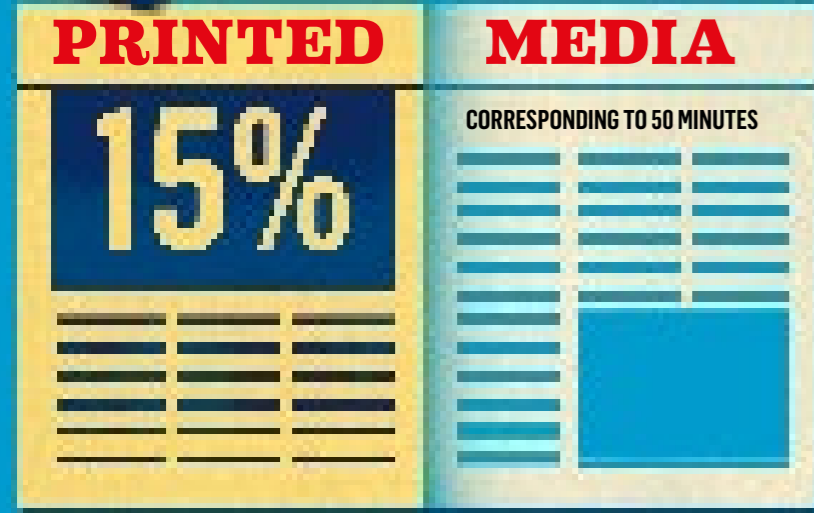
When digital advertising comes before printed advertising, the same effect is not achieved. Printed advertising does not notably gain from earlier digital exposure, whereas digital advertising often shows increased motivation and less cognitive load when it is preceded by printed advertising.

This indicates that the order of printed advertising before digital advertising reinforces the emotional effect of a campaign. For maximum outcome from digital channels, the communication should be via printed advertising first.

DAILY MEDIA CONSUMPTION

8333

MIN



Source: (European Commission Media Use in the EU)



Measurements taken during a neuromarketing study:

COGNITIVE LOAD
Do consumers process the information they receive? Do they perceive stress and a flood of information? Measured via brain scanning.

EMOTIONAL ENGAGEMENT
How much emotional response does the advertisement arouse in the consumer? Measured via brain scanning.

MOTIVATION
Do consumers show interest and a desire? Are they motivated to engage with the advertisement or do they want to avoid it? Measured via brain scanning.

ATTENTION
What do the consumers see and what do they miss? Are they focused or distracted? Measured via eye-tracking.

200 PEOPLE TOOK PART IN THE FIRST NEURO-MARKETING SURVEY IN THE NORDIC REGION.

1 + 1 = 3
PRINTED FIRST THEN DIGITAL

The study demonstrates that a combination of printed and digital communication is what delivers the best effect. Together, the channels have a greater effect than separately. Campaigns conducted in print channels first and then supported by communication in digital channels work best. The main effect is to enhance the emotional impact of a campaign. Going digital first does not have the same effect.

IKEA, Lindex, Panduro Hobby, ICA, Plantorama and SuperBrugsen participated with printed and digital advertising. The study was done by Ipsos AB, Neurons Inc and PostNord.

NEUROMARKETING

Neuromarketing is when neuroscience is used in marketing. The method employs brain scanning and eye-tracking to measure people's responses to communication.

PRINTED ADVERTISING = OK WITH MORE INFORMATION

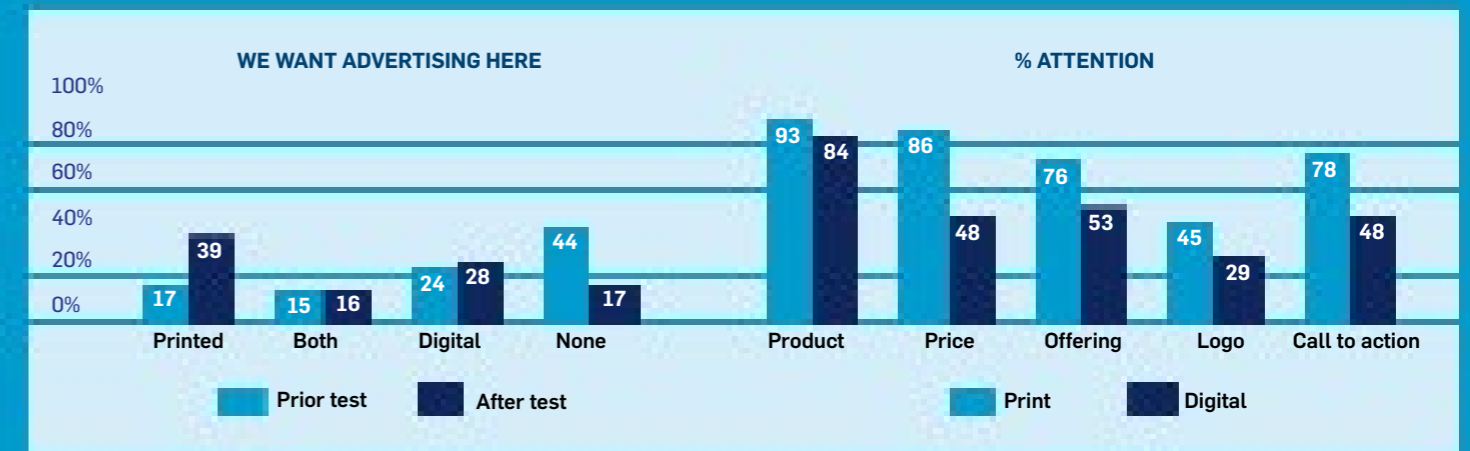
Printed advertising engages more and generates less cognitive load than digital advertising.

DIGITAL ADVERTISING = KEEP IT BRIEF

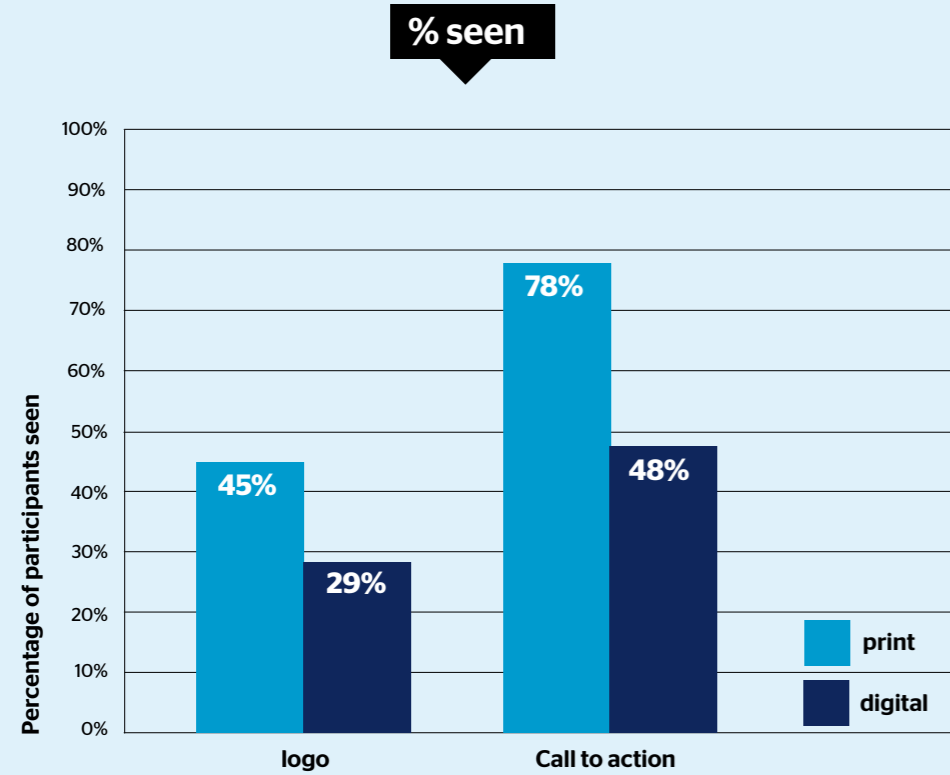
The recipient takes the information in more easily with printed than with digital advertising.

WE THINK WE PREFER DIGITAL

Many participants who prior to the test said they preferred digital advertising, where shown to react more optimal to print. In other words, what consumers say they prefer differs from where the optimal effect is achieved.



5



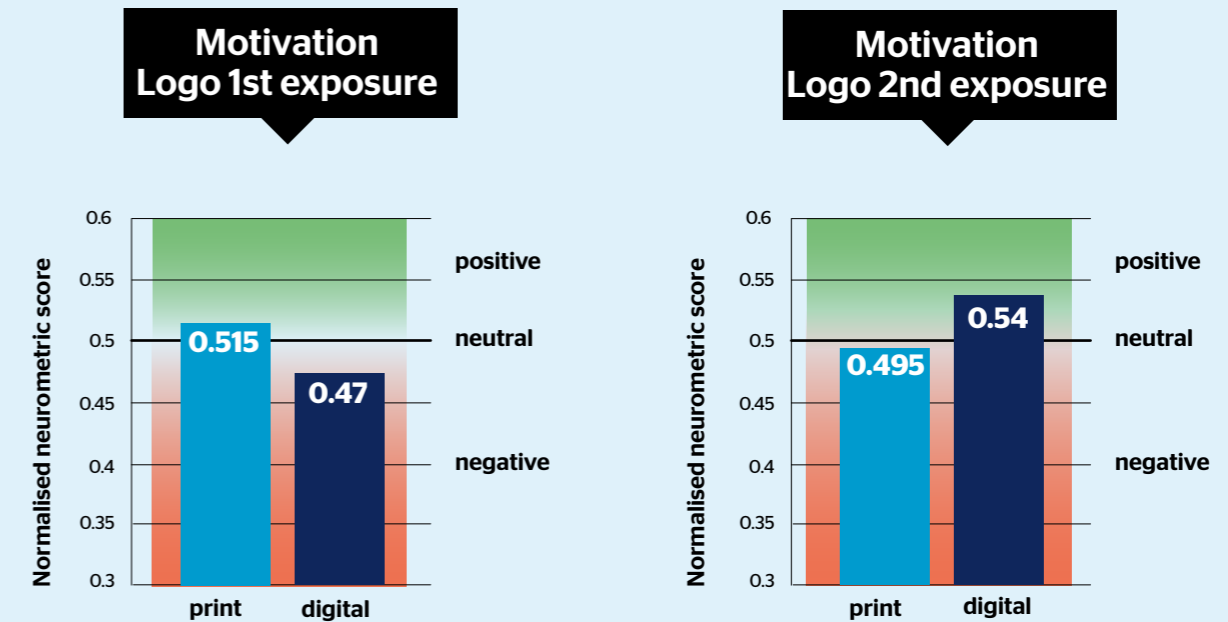
Printed advertising reinforces the brand and call to action

Printed advertising creates great attention to the brand and the call-to-action communication.

Printed advertising generates better attention than digital advertising to both brand and the call-to-action element of the advertisement.

In digital channels, the cognitive load results in the attention becoming more diffuse. This indicates the importance of simplifying the digital communication in order to reduce the cognitive load and, in so doing, improve the brand and the call-to-action communication.

6



The difference between the scores is statistically significant with 99.99% certainty. The scale used is a logarithmic scale, which means that a very small difference observed represents a much bigger difference on a normal linear scale.

Digital advertising reinforces printed advertising in the positioning of the brand

Digital advertising reinforces the positioning of the brand if it follows printed advertising.

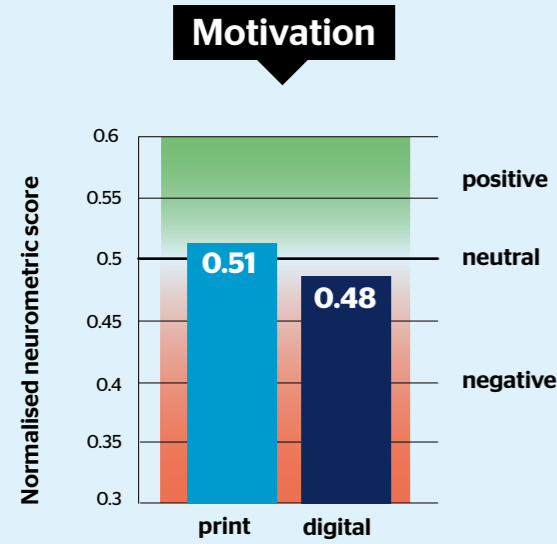
When consumers are exposed to a digital advertisement first, the brand gets a negative emotional response. The brand gets the same negative emotional effect if a printed advertisement follows the digital advertisement.

But if the consumer sees the printed advertisement first, the brand gets a strong, positive emotional response – and so too does a following digital advertisement, which then reinforces the impact of the brand communication.

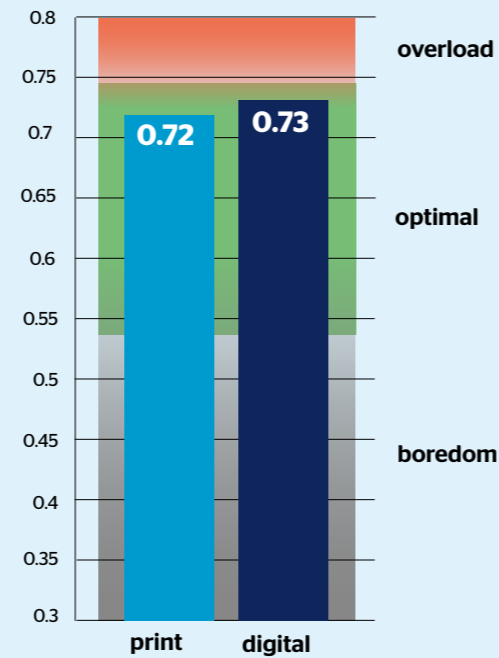
So combining digital advertising with printed advertising plays an important role if the aim is to strengthen the brand positioning and build positive emotional attachments to the brand. To create synergistic effects in brand-building campaigns and obtain a positive emotional response, printed advertising should therefore precede digital advertising.

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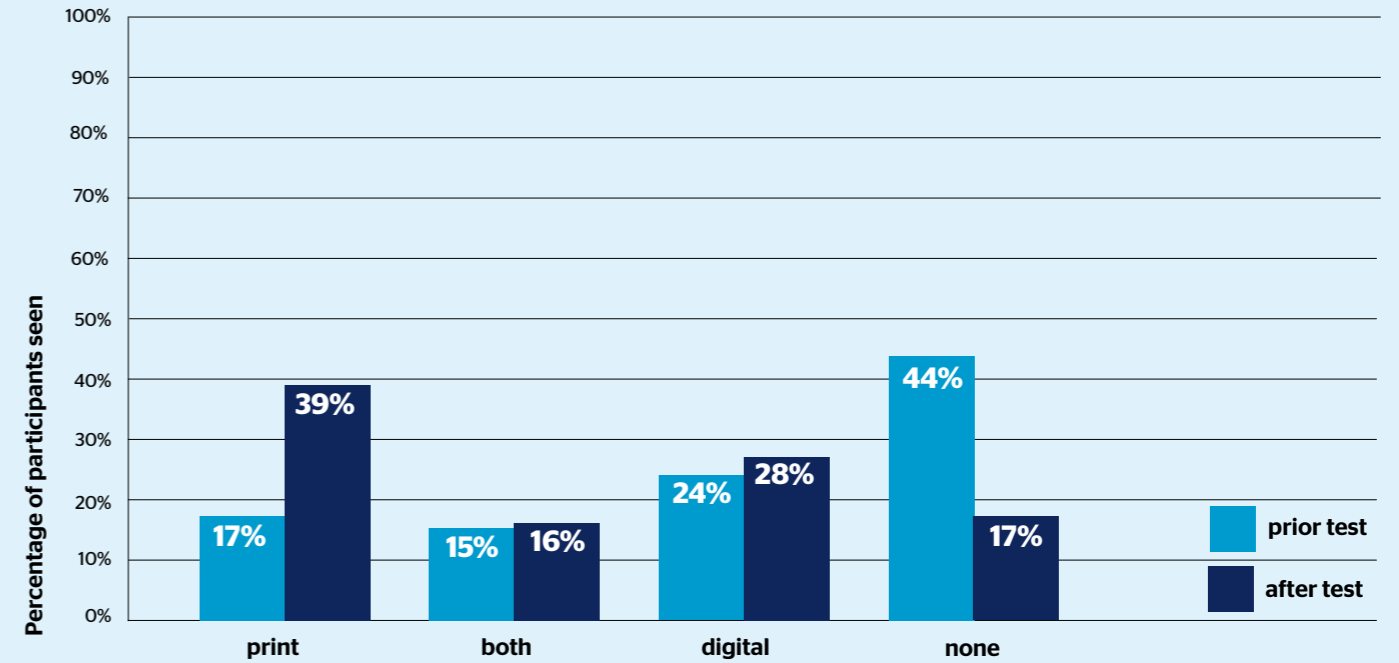


Cognitive load



8

Preferred channels when receiving advertising/offers



Younger generation prefers printed advertising

Printed advertising creates stronger emotional engagement among the younger generation.

The younger generation have grown up in a more digital world than earlier generations and mostly engage in technology-based media consumption. However, this study shows that printed advertising generates a higher emotional engagement and more positive feelings than digital advertising in all age groups, including the youngest (defined as 18-30 years).

This may be because the younger generation are more used to being disturbed by digital advertising and are therefore more selective in digital channels. They avoid digital advertising that is of no interest to them. Receiving printed advertising today is more unusual. Young people come across a huge volume of digital advertising and printed advertising has a chance of standing out from amidst the digital flow.

Digital advertising has a strong and positive image

More people say that they prefer digital advertising, compared to those who prefer advertising via the printed channel.

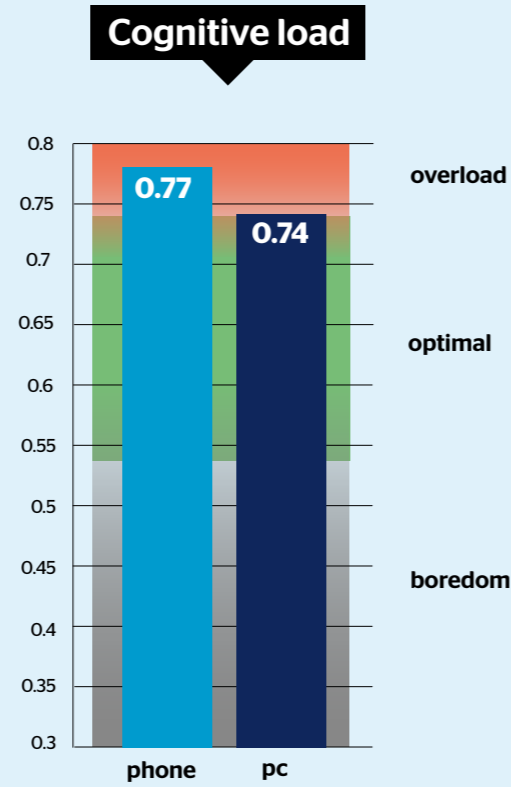
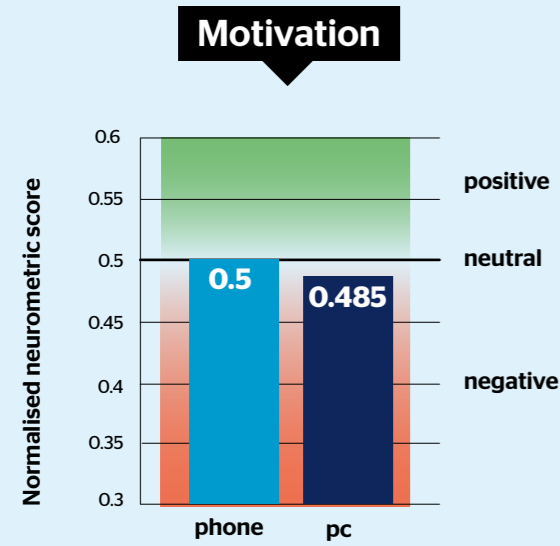
Before the brain's response and the eye's movements were measured, the consumers were asked about their attitudes and preferences regarding the different channels of communication.

Considerably more people said that they preferred digital advertising compared to those who preferred advertising via the printed channel. In other words, digital advertising has a stronger and more positive image. However, the image does not always fit with how consumers respond to different advertising channels. Many people who said that they preferred digital advertising responded more optimally in the printed channel. In other words, there are in certain cases differences between what consumers believe they prefer and where the optimal effect is obtained.

CONCLUSION

9

The difference between the scores is statistically significant with 99.99% certainty. The scale used is a logarithmic scale, which means that a very small difference observed represents a much bigger difference on a normal linear scale.



More emotional response on a smartphone than on a computer

Digital advertising on a smartphone creates more emotional response but increases stress.

When digital advertising on a smartphone was compared with digital advertising on a computer, the results show that advertising on a mobile creates a stronger and more engaging emotional response than if the advertising is seen on a computer. However, the cognitive load is higher on mobiles than on computers.

Irrespective of platform, the emotional engagement is lower and the cognitive load higher than via the printed channel.

BEHIND THE MIND AFTERWORD

Behind the Mind summarizes neuroscientific data from 200 test subjects. The data comprise 20,700,000 brain-scanned data points and 1,656,000 eye-tracking data points. This is a huge volume of information, from tests that require engineering expertise, statistics, psychology and neuroscience to perform.

The results of the study demonstrate that a combination of printed and digital advertising delivers the best effect. Together, the effect is greater than for the channels separately. One plus one makes three. These results are general, that is, they apply even to the youngest.

