Cognitextual:
A Neuroanalytic
Study of Contextual
Ad Effectiveness

gumgum

The Leader In Contextual Relevance

Contents

Source: GumGum & SPARK Neuro, Neuroanalytic Analysis of Contextual Ad Placement Effectiveness, January 2020
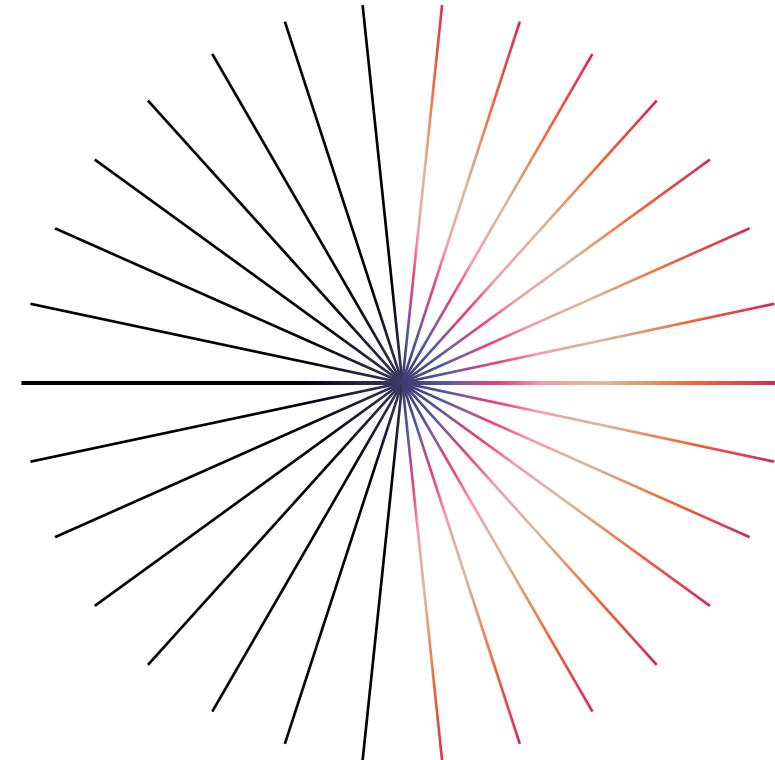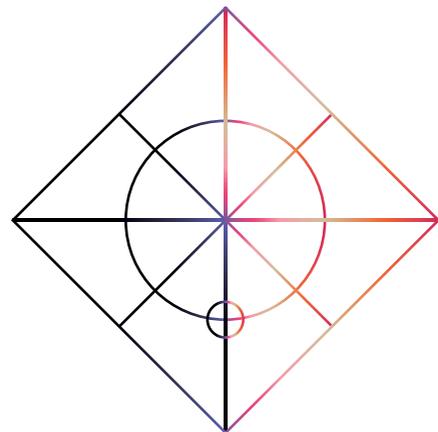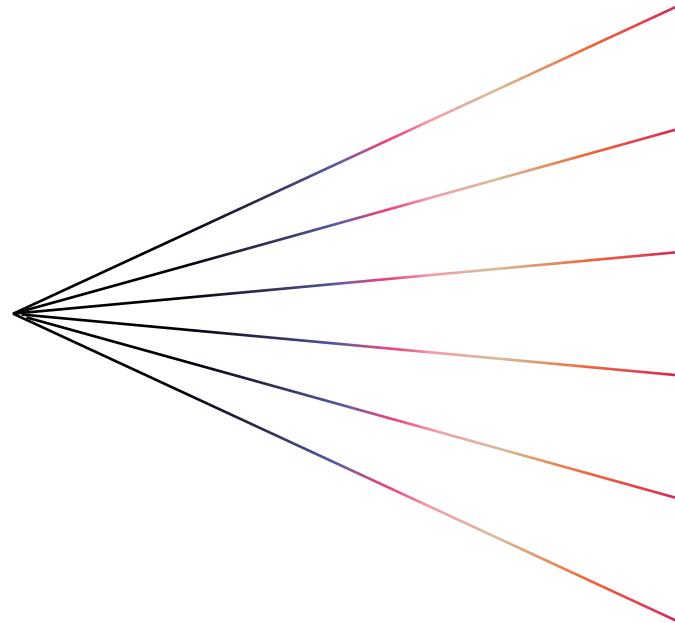
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Intro

Context Matters Most

For years, digital advertising has promised brands a simple, oft-repeated value proposition: To deliver the right ad, to the right person, at the right time.

Whereas the constraints of traditional television and print media had always forced advertisers to show the same ad to every consumer, the rise of programmatic advertising empowered brands to match individual impressions to individual users' tastes and behaviors. Of course, targeting that way requires troves of third-party user data––information acquired from outside sources to better understand users' demographic and location data, purchase history and online browsing footprint. And, now, third-party data is in decline.

The European Union's General Data Protection Regulation and The California Consumer Privacy Act have placed meaningful restrictions on how brands can collect and share this information, and major browsers like Google Chrome are sunsetting the cookies that have long fueled the third-party ecosystem.

How, then, can advertisers continue to pursue digital's tantalizing promise of the right ad, for the right person, at the right time?

The answer lies in the text, photos and videos that are already on the user's page. After all, if someone is viewing a photo gallery of Hawaiian beaches, it's a good bet they may be interested in seeing a hotel offer—even if you don't have third-party data that tells you they've been browsing airfares.

We call that sort of information "contextual data" because it provides crucial insight into the contexts in which brands advertise. When used properly, it's just as powerful as third-party data, if not more so.

With GumGum's proprietary computer vision and natural language processing technology, we're able to understand the text, videos and images that appear on millions of websites all over the world. Utilizing these tools, we deliver contextually relevant advertising that empowers brands to advertise, for instance, basketball apparel to a fan right as they're reading an article about their favorite team.

In order to prove the effectiveness of contextual advertising in a post-third-party data world, we teamed up with the neuroanalytics company SPARK Neuro to study how an ad's contextual relevance impacts consumers' emotion and attention. What we found is that more relevant ads consistently drove higher neural engagement, better advertising recall and greater purchase intent.

This guide is both a supplement and a review of our study, offering insight into the data points we uncovered with SPARK Neuro and a whole host of case studies designed to help marketers understand and harness the best kept secret in digital advertising.

If this guide piques your interest, visit our website at gumgum.com to learn more, or read up on how we handle user data at gumgum.com/terms-and-policies.

GumGum + SPARK Neuro: How We Came Together

With advertisers increasingly turning to contextual targeting in the post-third-party data era, we at GumGum wanted scientific proof for what we've known for over a decade: that contextually relevant messaging is a key driver of advertising success.

That's why we reached out to SPARK Neuro. Their neuroanalytic techniques for studying brain activity, eye-movement and physiological response could give us better understand how consumers relate to contextual advertising on an emotional and attention level.

Together, we designed a global experiment with participants across three continents to study how the contextual relevance of advertisements influences how consumers respond to them.

The end result? Strong empirical evidence, derived from the most advanced neuroscientific research methods, that contextually relevant ads consistently delivered higher performance.

"When GumGum approached us about this project, we knew it was just the right kind of interesting research question our tech is built to answer. We've long been aware of GumGum's leadership in the contextual relevance space so we were enthusiastic about exploring the different ways context influences how people consume digital advertising. We are excited to continue working with the folks at GumGum to answer questions about how to make advertising more relevant to people."

— Spencer Gerrol, CEO, SPARK Neuro

"SPARK Neuro's suite of neuroanalytic tracking technologies is like a lie-detector test on steroids. We're extremely grateful for the expertise they demonstrated throughout our partnership, which produced a powerful proof that contextual relevance is essential to effective advertising."

— Phil Schraeder, CEO, GumGum

Methodology

The global study included 60 participants from the US, UK, and Japan. All were subjected to the same study components.

First, they were hooked up to four biometric sensors: EEG for monitoring brain activity, GSR and facial coding to gauge emotional responses, and eye tracking to evaluate attention. They were then given a subconscious influence assessment, establishing baseline metrics for their brand affinity and purchase intent.

Next, participants were asked to read six articles on different topics. Each article featured three ads whose relevance to article content ranged from high to low. For example, an article about soccer included ads for soccer apparel (highly relevant), beverages (vaguely relevant) and electronics (irrelevant). Participants' attention and emotional response were measured as they read the articles and looked at the ads.

Once all biometric data was collected, participants were given a memory assessment and post-exposure subconscious influence assessment.

Finally, in-depth interviews with participants were conducted to yield qualitative feedback on the effectiveness of the ads featured in the study.
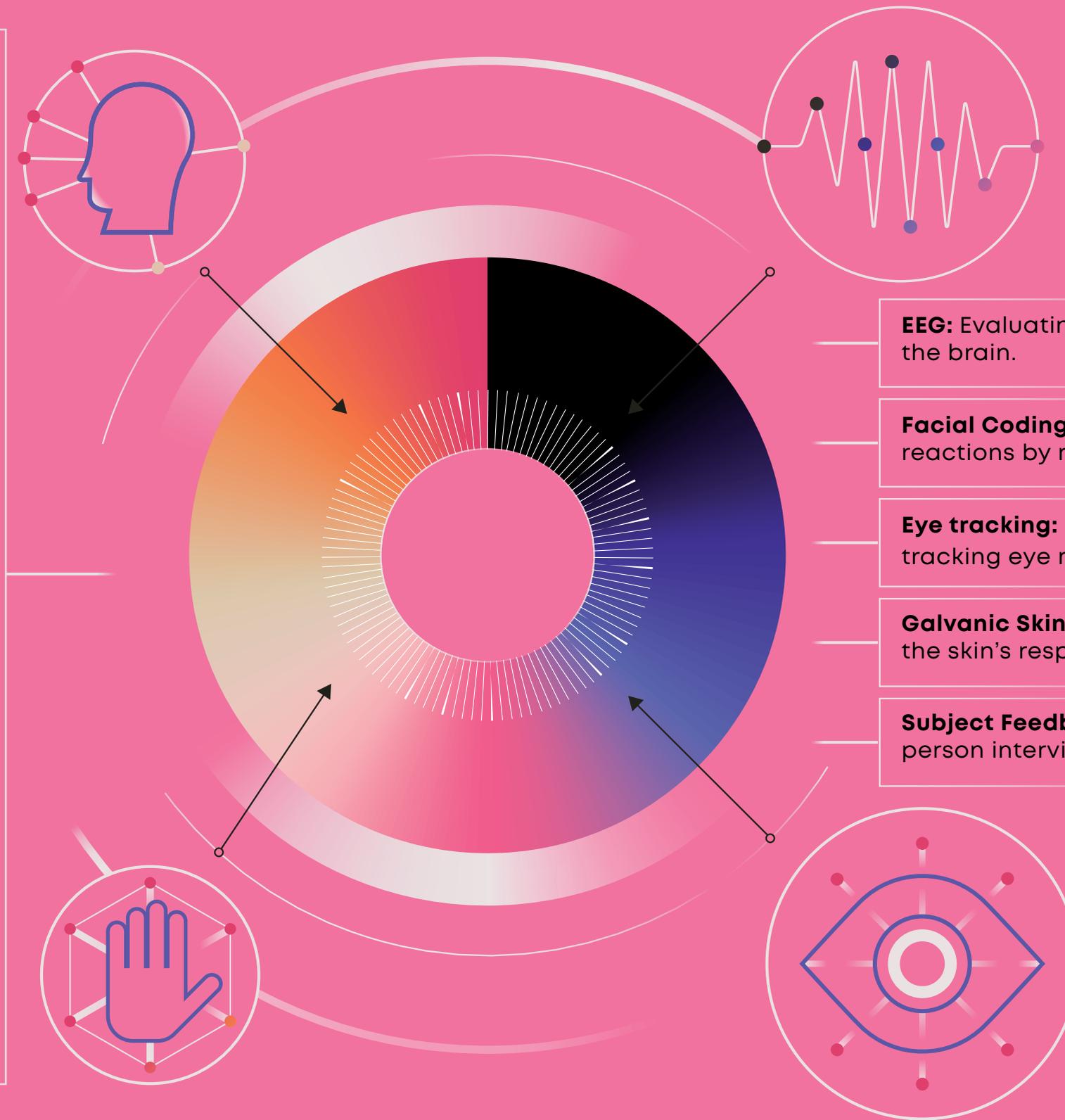
60	Participants
18-54	Ages
50/50	Male/Female
US, UK & Japan	Citizens

EEG: Evaluating the electrical activity in the brain.

Facial Coding: Gauging emotions and reactions by recording facial expressions.

Eye tracking: Evaluating attention by tracking eye movement.

Galvanic Skin Response (GSR): Measuring the skin's response to the stimuli.

Subject Feedback: In-depth survey and in-person interviews.

Key findings

ENGAGING, MEMORABLE, EFFECTIVE ADS

Contextual ads outperformed non-contextual in these areas:

Higher Neural Engagement

Contextually relevant ads generated 43% more neural engagement than contextually irrelevant ads.

43%
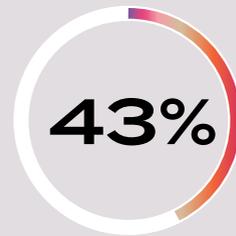
More Memorable

Contextually relevant ads are 2.2X more memorable than contextually irrelevant ads.

2.2x
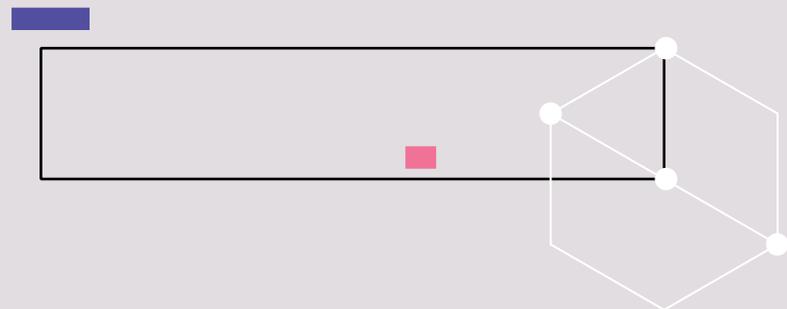
More Engaging

Contextually relevant ads were more engaging than contextually irrelevant ads and were actually 10% more engaging than article content overall.

10%

Drive Sales

Contextually relevant ads inspired greater purchase intent across the board.

$$$

Memory

Five of the top 6 performers were highly contextually relevant, while the three worst performers were contextually irrelevant.

In-Screen

82% ▲

60% ■

58% ▲

In-Image

44% ▲

44% ▲

Banner

44% ▲

38% ■

40% ■

42% ▲

36% ▲

34% ▼

34% ■

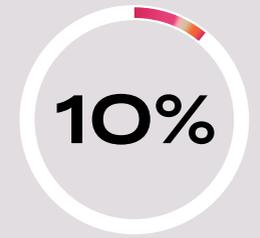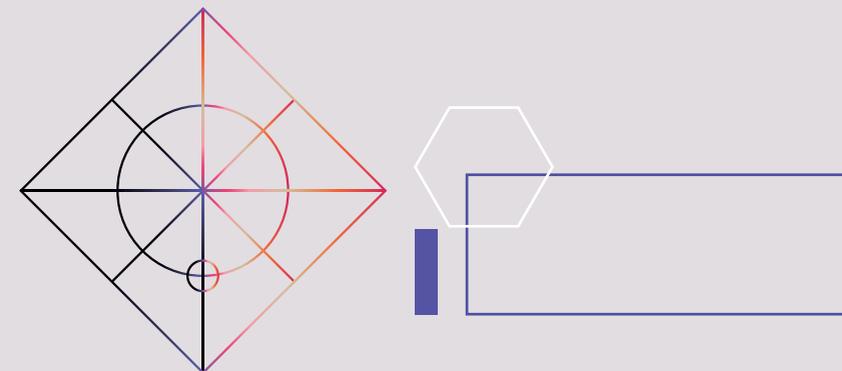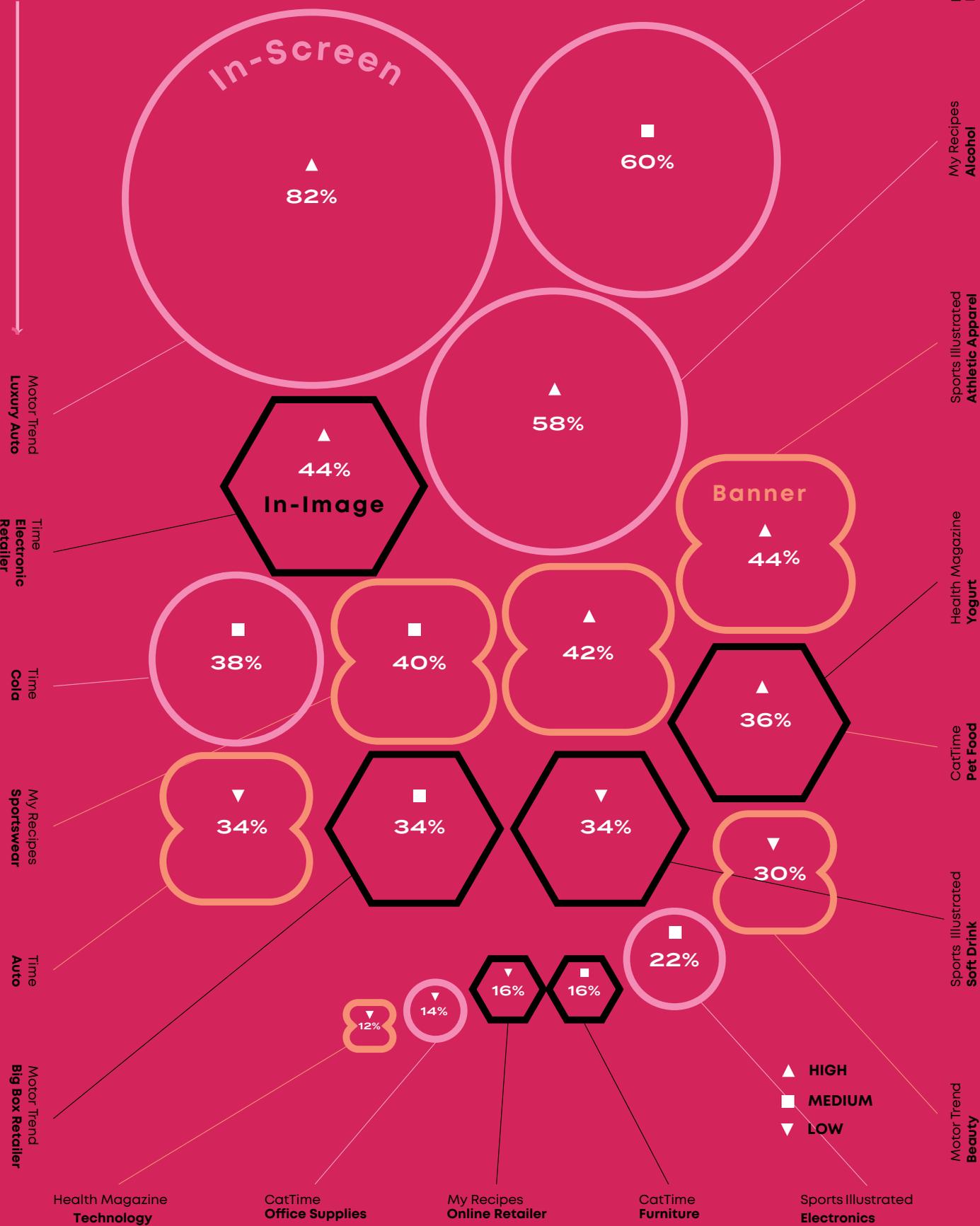34% ▼

30% ▼

22% ■

16% ▼

16% ▼

14% ▼

12% ▼

▲ HIGH
■ MEDIUM
▼ LOW

Motor Trend **Luxury Auto**

Time **Electronic Retailer**

Time **Cola**

My Recipes **Sportswear**

Time **Auto**

Motor Trend **Big Box Retailer**

Health Magazine **Technology**

CatTime **Office Supplies**

My Recipes **Online Retailer**

CatTime **Furniture**

Sports Illustrated **Electronics**

Motor Trend **Beauty**

Sports Illustrated **Soft Drink**

CatTime **Pet Food**

Health Magazine **Yogurt**

Sports Illustrated **Athletic Apparel**

My Recipes **Alcohol**

Health Magazine **Fast Food**

Neural Engagement

High context ads delivered the top three engagement scores, while low context ads produced 5 of the 6 lowest engagement scores.

ADS | **Engagement**

	3	4	5

MotorTrend / Luxury Auto — 4.75

Sports Illustrated / Athletic Apparel — 4.57

Time / Electronics Retailer — 4.15

My Recipes / Alcohol/Spirits — 3.18

Health Magazine / Yogurt — 3.91

CatTime / Pet Food — 5.25

High Context
Average: 4.3

MotorTrend / Big Box Retailer — 4.51

Sports Illustrated / Soft Drink — 4.28

Time / Auto — 3.86

My Recipes / Sportswear — 4.05

Health Magazine / Fast Food — 3.9

CatTime / Furniture — 4.50

Medium Context
Average: 4.1

MotorTrend / Beauty — 4.47

Sports Illustrated / Electronics — 3.28

Time / Cola Beverage — 3.36

My Recipes / Online Retailer — 3.48

Health Magazine / Technology — 3.48

CatTime / Office Supplies — 0.00

Low Context
Average: 3.0

—— In-Screen   —— Banner   —— In-Image

What the participants had to say
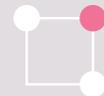
"I absolutely want the ads to be in context. I'm reading it for a reason, that's where my headspace is. If you're trying to sell me something unrelated to my mindset, I don't care about it."

"I was mostly fixated on the food. So when the ad was technology, I brushed it off."

"If I'm reading an article about yogurt, my mind is not on fast food."
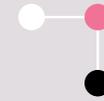
"I don't remember seeing the sports car ad. It doesn't go with the rest of the article. It goes outside the range."

"I think ads should relate. If I'm interested in the article, I'm probably interested in the product related to that."

"If you're trying to read something, especially if it's important, you don't want a disruptive ad."

Why Contextual Ads Are More Engaging
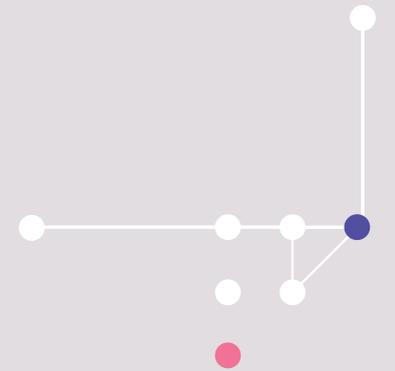
It wasn't all that long ago that context was a concept foreign to most marketers: As recently as mid-century, television viewers might be as likely to see a Marlboro Man ad while watching "I Love Lucy" as they would during "Gunsmoke." Yet by the late 1950s, researchers were beginning to explore the idea that the environment in which consumers viewed an ad might matter nearly as much as the content of the ad itself.

Sixty years later, marketers are still learning about the role that context plays in how ads are perceived—and in the digital age, they're finding that it may be more important than ever.

"The new research clearly corroborates the premise that the context in which an advertisement is placed likely will influence consumers' perceptions of and response to the advertising," writes Horst Stipp of the Advertising Research Foundation in a recent article for the Journal of Advertising Research. "It confirms that the processes that generate such effects are complex."

The reasons may be complicated, but the bottom line of contextual advertising is pretty simple: Ads that are contextually relevant are more engaging, more memorable and more likely to drive purchase intent than ones that aren't.

GumGum recently partnered with neuroanalytics firm SPARK Neuro to test this notion and to explore the nuances of contextual advertising content and placement.Participants were asked to read six articles in random order, while biometric sensors tracked their neural and physiological responses to the advertisements therein. Using devices such

as EEG, facial coding and eye tracking, researchers measured participants' attention and emotional intensity toward a variety of ad formats and contexts, from high-context in-screen ads to low-context banners. Combined with subsequent surveys and interviews, the results offered a glimpse into how engaging and memorable each of the ads were.

A few key findings: There was a correlation between an advertisement's degree of contextuality and the engagement the ad elicited. Simply put, the more contextual the ad, the more engaging it was. The same principle held true when testing how memorable an ad was, with high-context ads remembered an average of 10 times more than low- or medium-context ads. Banner ads proved to be the most attention-grabbing, while in-screen formats were most memorable. And across the 18 widely varied brands featured, the more highly contextual ads also resulted in greater purchase intent.

So we know that context can elevate an advertisement's engagement and effectiveness, but that raises the question: Why?

"In the attention-transfer process, other things being equal, an advertisement seen or heard in a context that a consumer pays more attention to more likely will be seen or heard," Stipp writes. "High correlations between attention to content and advertisement recall have been shown repeatedly."
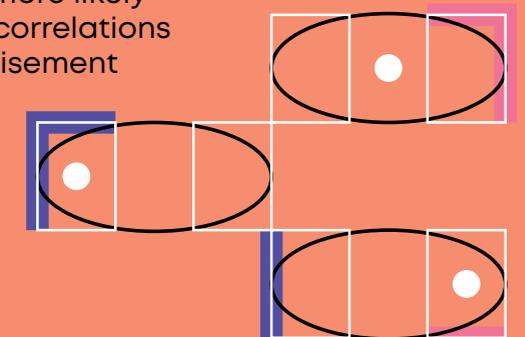
Yet content isn't the only context to consider: The media platform, device, time and even location where consumers view an ad can also affect their response to it. And it's important for marketers to understand not just if, but why consumers connect to particular content, in order to use what Stipp and others call emotional targeting. By exploring what drives preferences for platforms, content and interest in the brand itself, he writes, advertisers have an opportunity to connect with consumers on a deeper level.

"If marketers understand their specific targets' affinity to the content with which their consumers engage, as well as the role of other contexts—such as other media platforms, time and place—there are real opportunities to enhance the effectiveness of advertising messages," he writes. "When it comes to context effects, there are no one-size-fits-all rules."

▶ Watch the study:
gumgum.com/cognitextual

APPENDIX

Context #1

MOTORTREND

https://gumgum.com/cognitextual

5 THINGS TO KNOW ABOUT THESE NEW LUXURY CARS

article one

Relevance takes the checkered flag.

MEDIUM

BIG BOX RETAILER

Participants' gaze patterns confirm the neuro data, showing people only focused on the external borders of the Beauty brand's ads, but were able to incorporate the Luxury Auto and Big Box Retailer's ads much more holistically.

LOW

BEAUTY

HIGH

LUXURY AUTO

one

Neural Engagement

▲ 4.75%
Luxury Car

■ 4.51%
Big Box Retailer

▼ 4.47%
Beauty

Brand Recall

■ Big Box Retailer
34%

10

▲ Luxury Car
82%

1

13

▼ Beauty
30%

Context   ▲ HIGH   ■ MEDIUM   ▼ LOW   ● Overall Memory Rank

Motor Trend
/ Relevance takes the checkered flag

A car brand placed a highly relevant ad on a Motor Trend article, driving a staggering 82 percent memory among surveyed consumers—the best of any ad we studied. Eye-tracking data confirms that users saw only the outside borders of the least relevant ad on the page.

Context #2

SPORTS ILLUSTRATED

https://gumgum.com/cognitextual

SOCCER SPONSORSHIPS WORTH MORE THAN $100 MILLION PER SEASON

article two

Low relevance causes low attention.

MEDIUM

SOFT DRINK

Participant gaze patterns easily spilled over onto the Athletic Apparel banner ad, and onto the Soft Drink In-Image ad. Even though the majority of readers looked at the In-Screen Electronics ad, the neuro (and survey) data shows that they were not paying much cognitive attention to the ad, nor were they encoding it into memory.
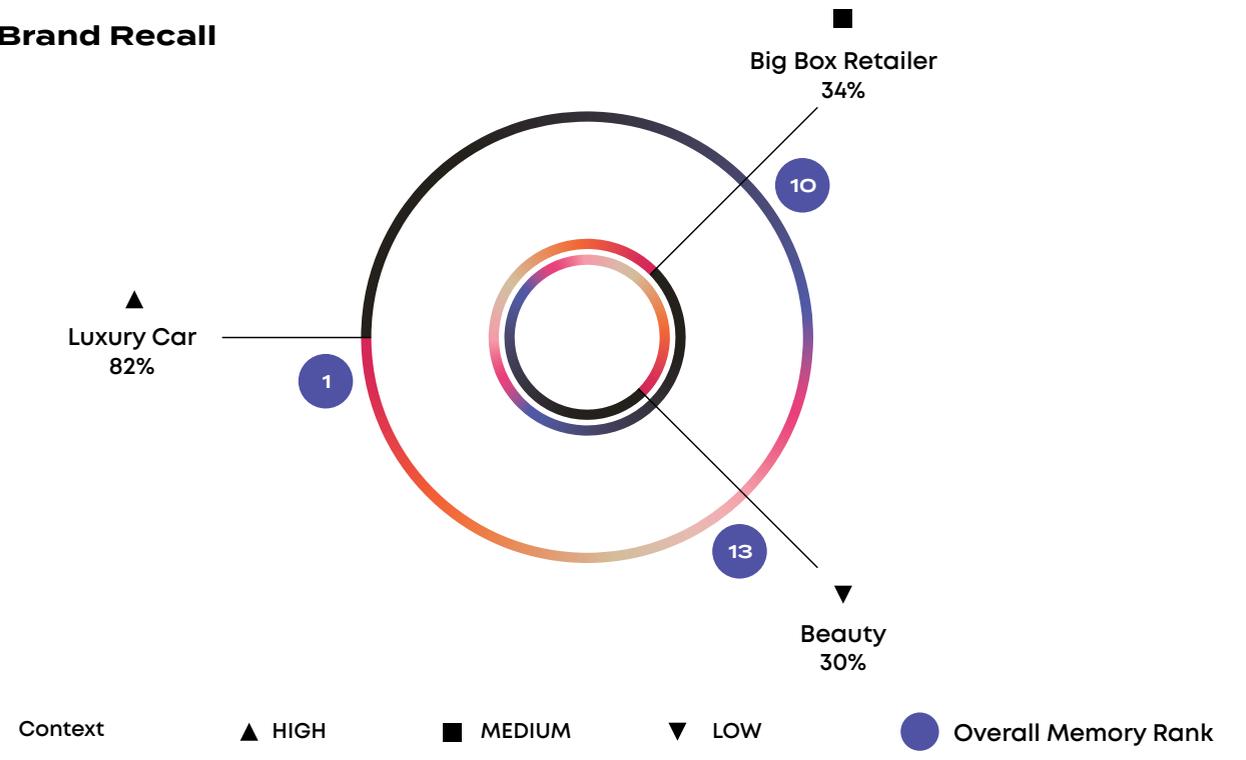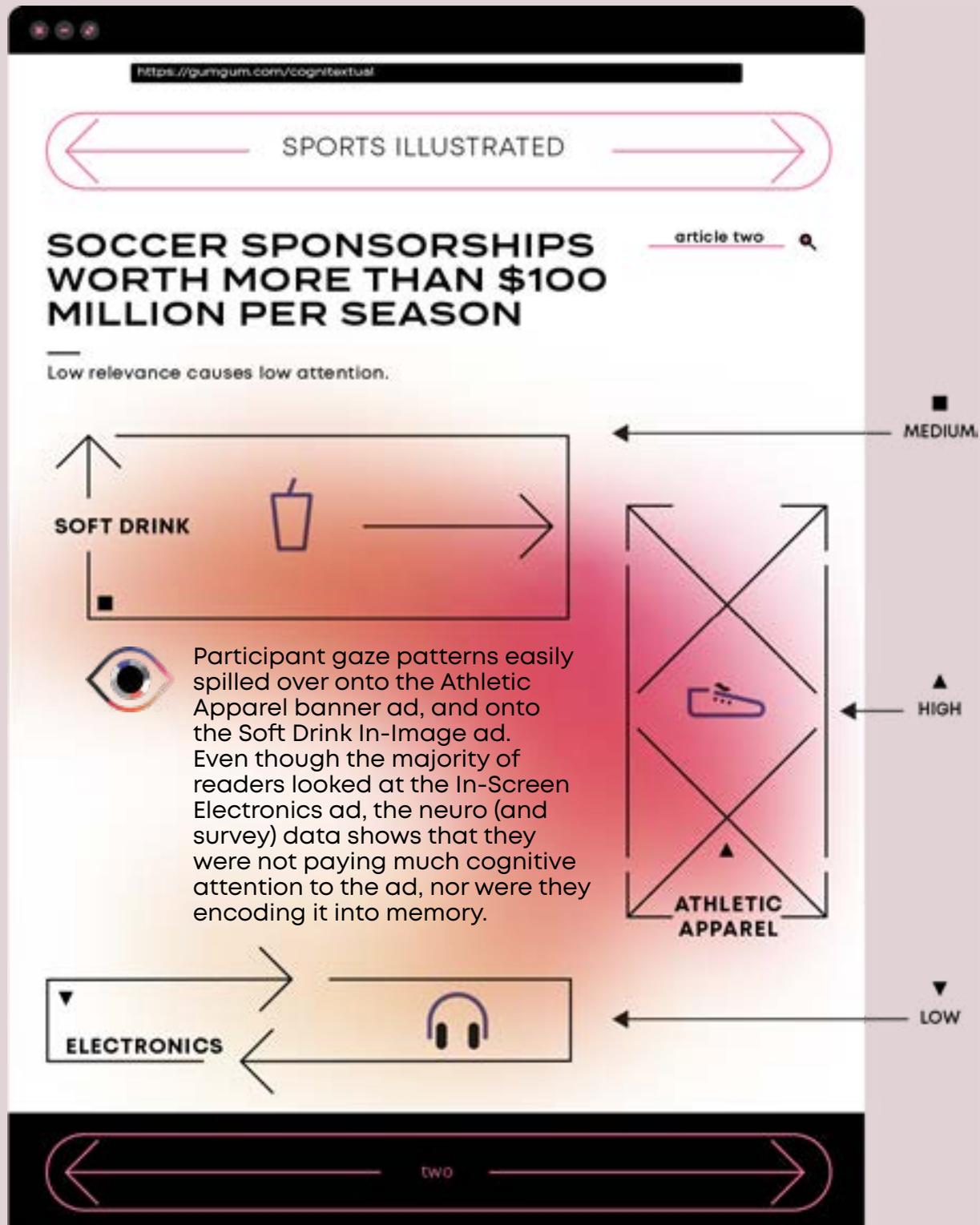
HIGH

ATHLETIC APPAREL

ELECTRONICS

LOW

two

Neural Engagement

▲ 4.57%
Athletic Apparel

■ 4.28%
Soft Drink

▼ 3.28%
Electronics

Brand Recall

■ Soft Drink 34%

11

▲ Athletic Apparel 44%
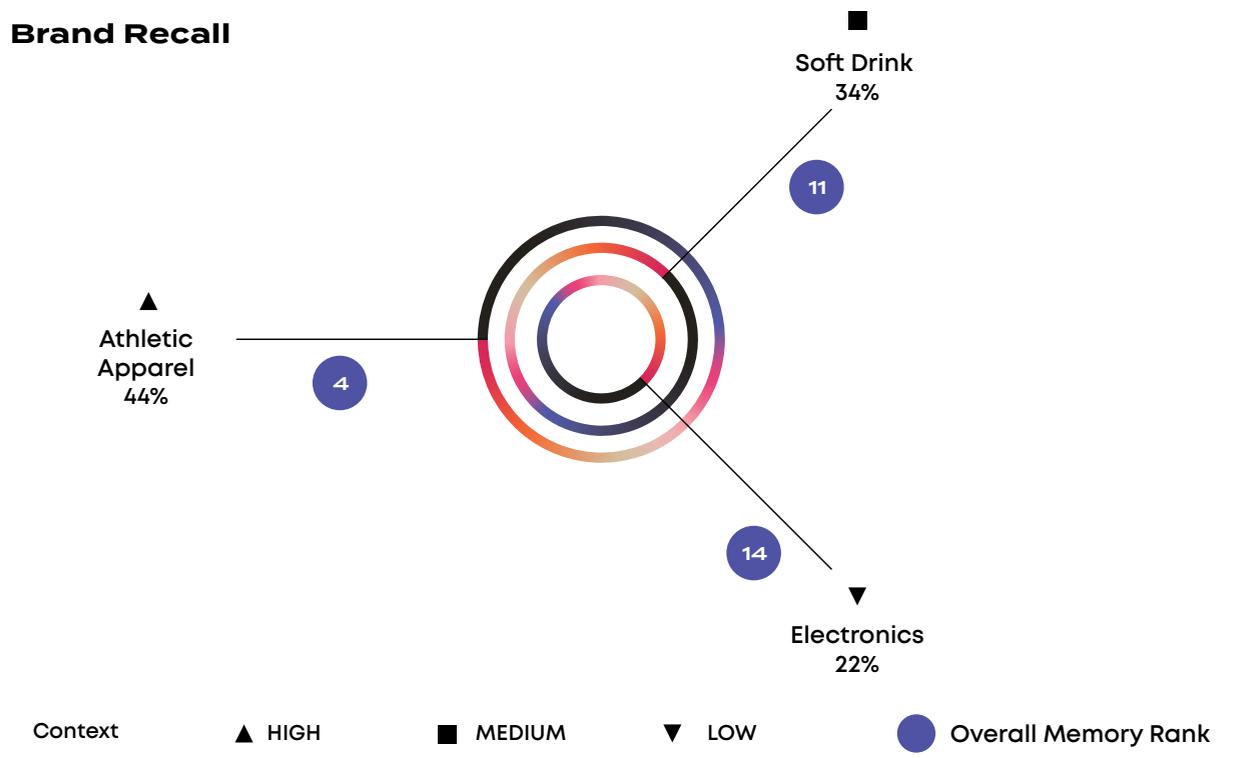
4

14

▼ Electronics 22%

| Context | ▲ HIGH | ■ MEDIUM | ▼ LOW | ● Overall Memory Rank |

Sports Illustrated
/ Low relevance causes low attention

An In-Screen consumer tech ad was seen by a majority of users, but our neuro data shows that they didn't pay much cognitive attention to it, largely due to its low relevance. A highly relevant sportswear brand generated far better recall.

Context #3

TIME

article three 🔍

30 TECH GADGETS FOR EVERYONE ON YOUR SHOPPING LIST

State-of-the-art relevance.

▲ HIGH

ELECTRONICS RETAILER

Gaze patterns initially easily spilled over onto the Auto banner ad after reading the article title, but readers' visual attention failed to return to it as the article was scrolled through. The In-Screen Cola ad also attracted residual attention, mostly as the user reached the end of the page.

■ MEDIUM

AUTO

▼ LOW

COLA BRAND

three

Neural Engagement

▲ **4.15%** — Electronics Retailer

■ **3.36%** — Auto

▼ **3.86%** — Cola Brand

Brand Recall

■ Auto 34%

12

▲ Electronics Retailer 44%

5

8

▼ Cola Brand 38%

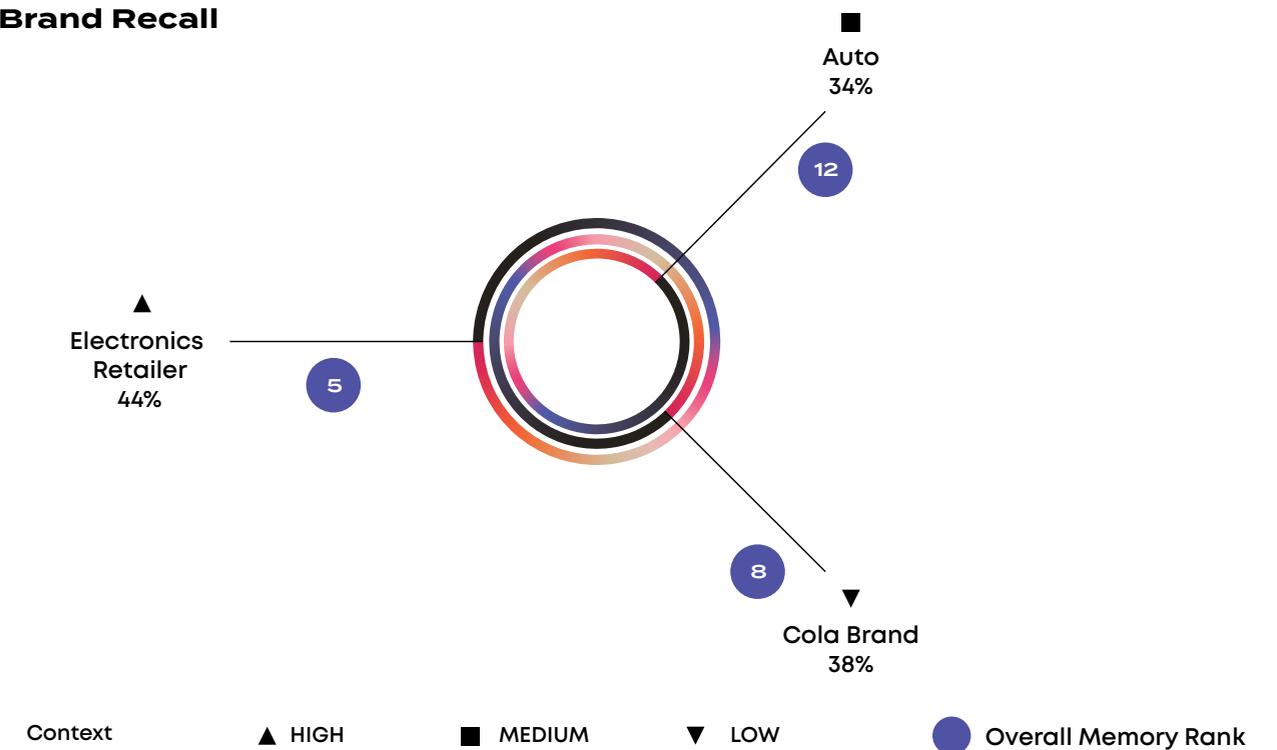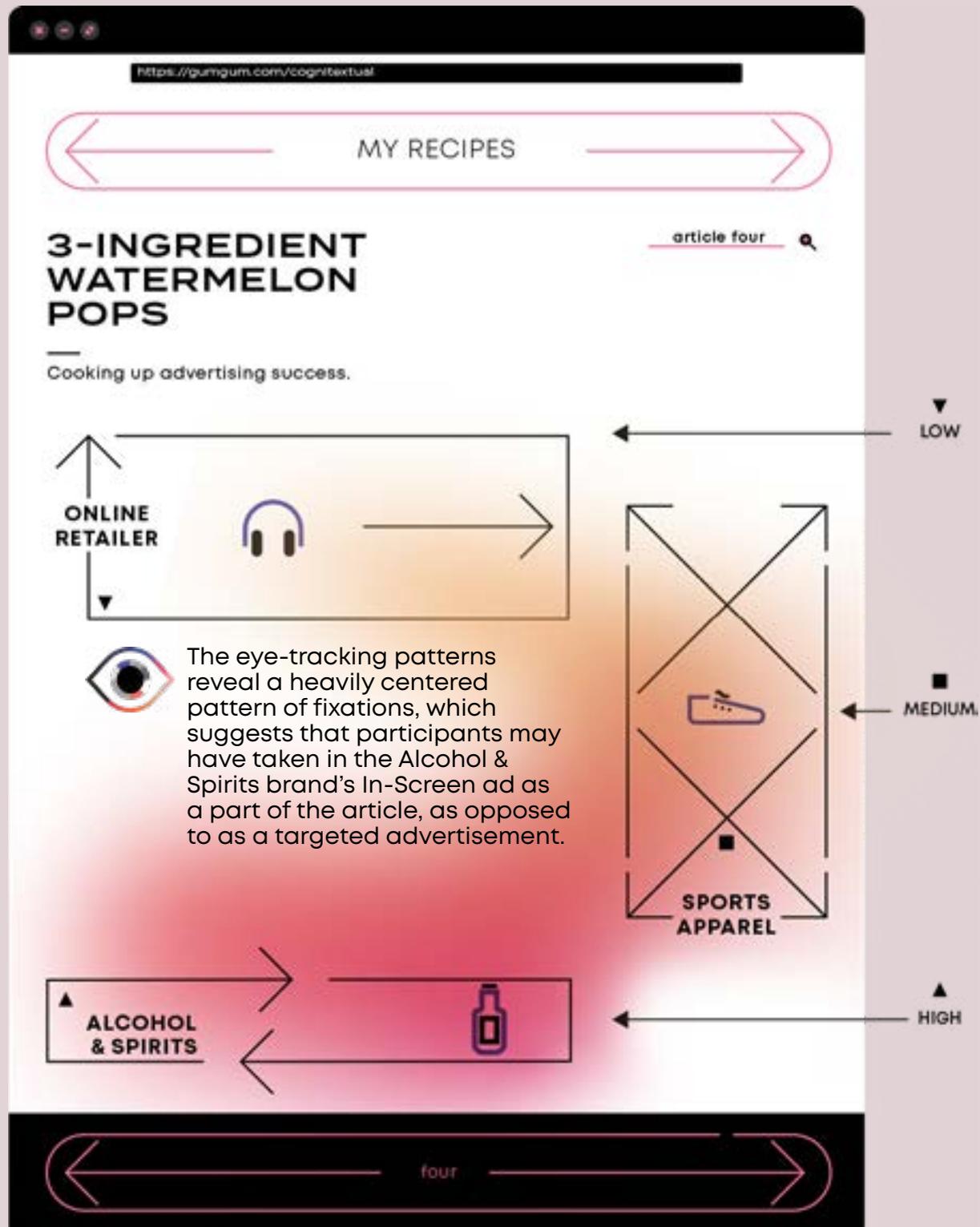| Context	▲ HIGH	■ MEDIUM	▼ LOW	● Overall Memory Rank

Time

/ State-of-the-art relevance

A highly relevant retail brand scored big with an In-Image ad on a consumer technology article. Meanwhile, a popular soft drink brand generated decent memory despite low neural engagement, a testament to the strength of its brand.
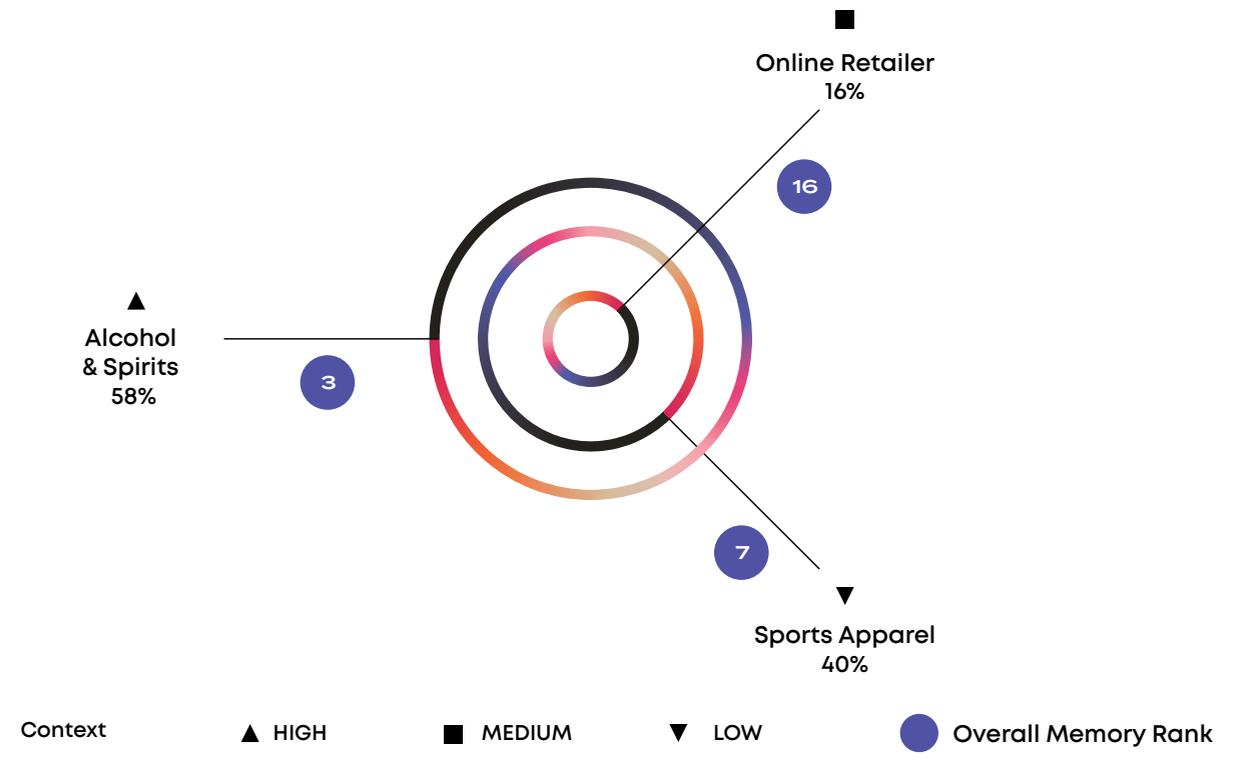
Context #4

MY RECIPES

article four

3-INGREDIENT WATERMELON POPS

Cooking up advertising success.

ONLINE RETAILER

LOW

The eye-tracking patterns reveal a heavily centered pattern of fixations, which suggests that participants may have taken in the Alcohol & Spirits brand's In-Screen ad as a part of the article, as opposed to as a targeted advertisement.

MEDIUM

SPORTS APPAREL

ALCOHOL & SPIRITS

HIGH

four

Neural Engagement

▲ 3.18%

Alcohol & Spirits

■ 4.05%

Sports Apparel

▼ 3.48%

Online Retailer

Brand Recall

Online Retailer
16%
16

Alcohol & Spirits
58%
3

Sports Apparel
40%
7

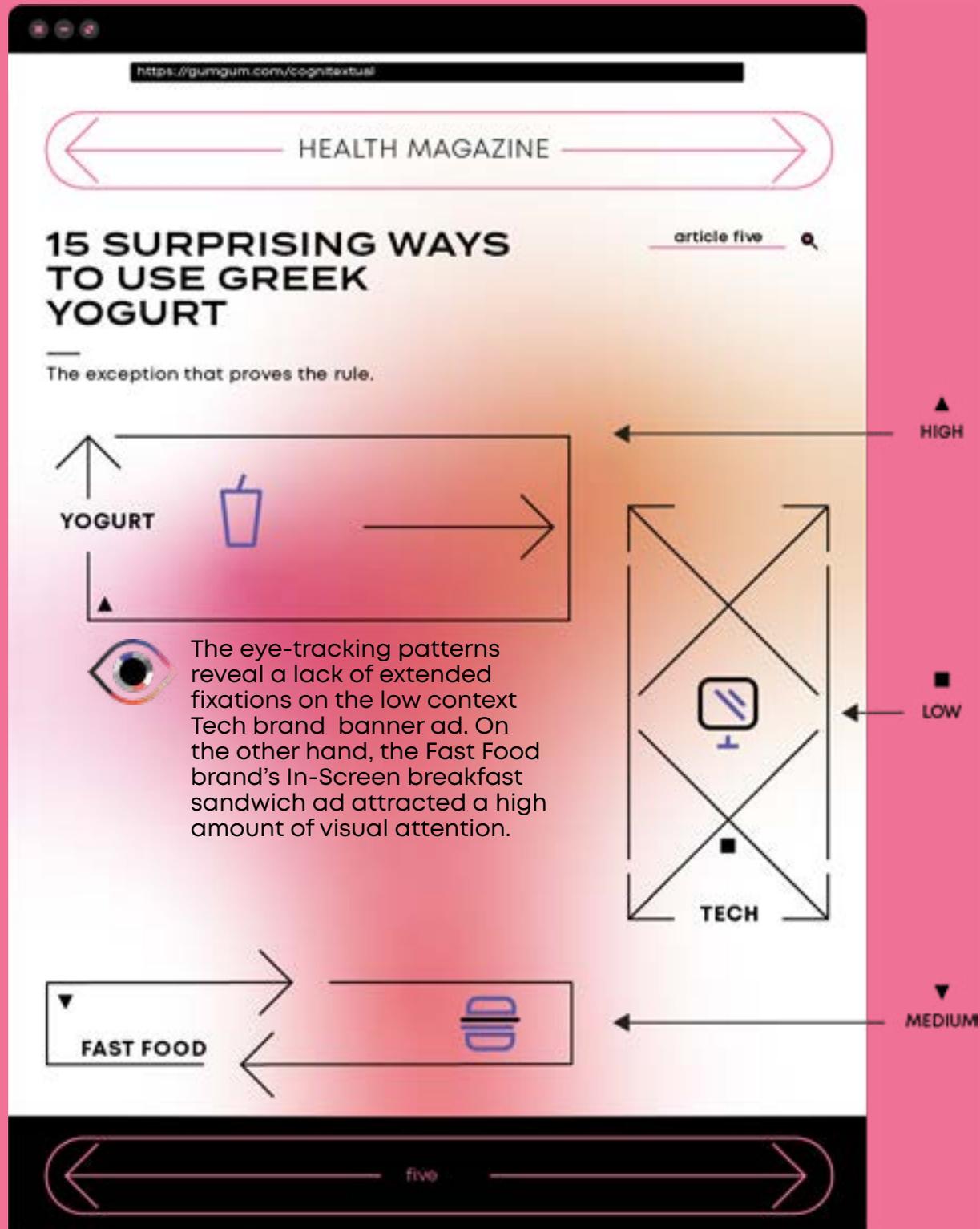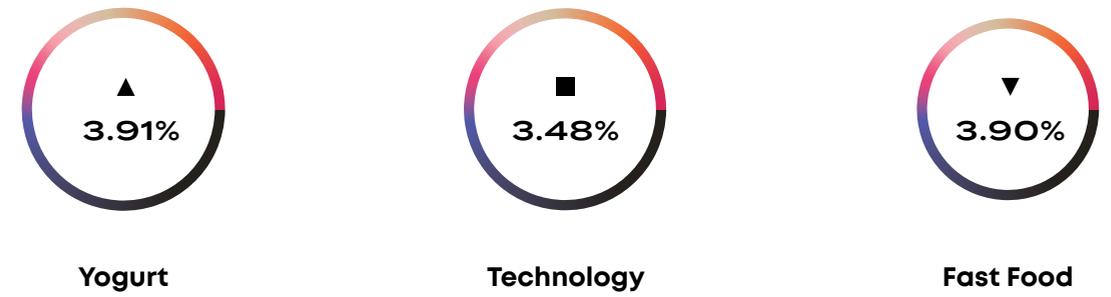| Context	▲ HIGH	■ MEDIUM	▼ LOW	● Overall Memory Rank

My Recipes
/ Cooking up advertising success

An In-Screen ad was so relevant that there was little spike in neural engagement, suggesting viewers consumed it as though it were part of the article. Despite this low neural attention, it still posted the third-highest memory of any ad we studied.
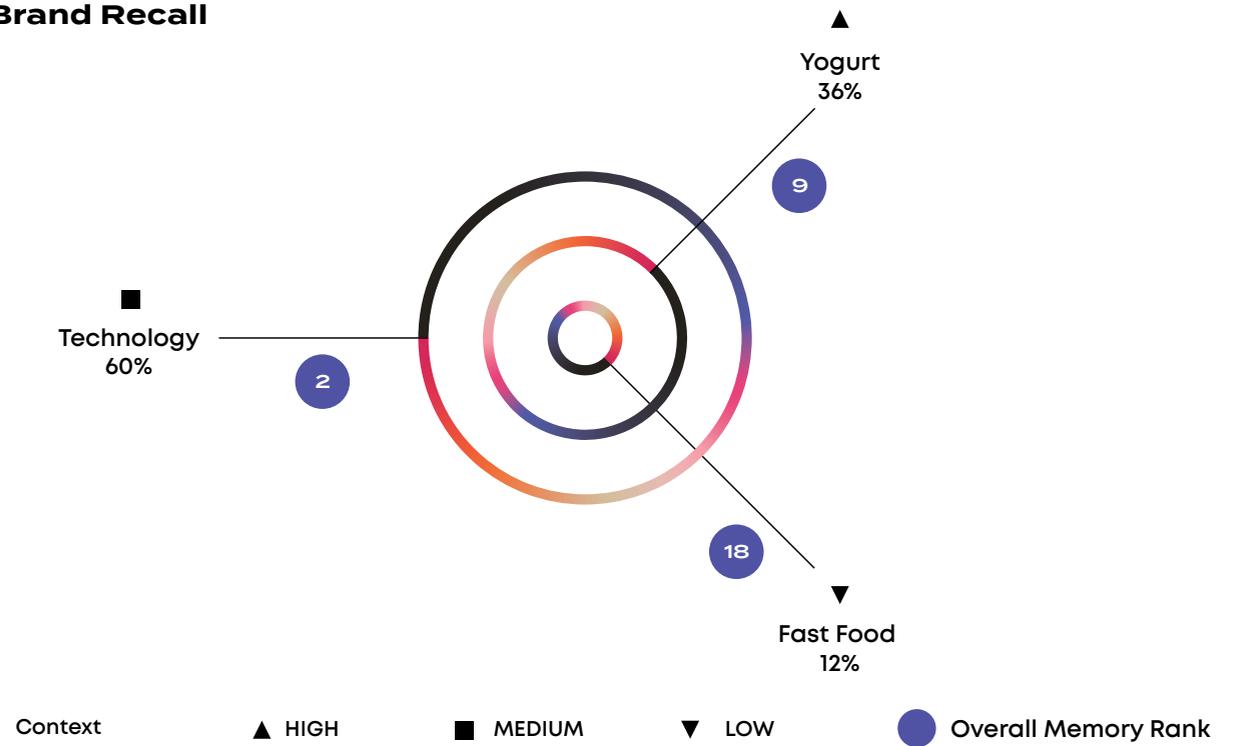
Context #5

The eye-tracking patterns reveal a lack of extended fixations on the low context Tech brand banner ad. On the other hand, the Fast Food brand's In-Screen breakfast sandwich ad attracted a high amount of visual attention.

Neural Engagement

Yogurt ▲	Technology ■	Fast Food ▼
3.91%	3.48%	3.90%

Brand Recall

Yogurt
36%

9

Technology
60%

2

18

Fast Food
12%

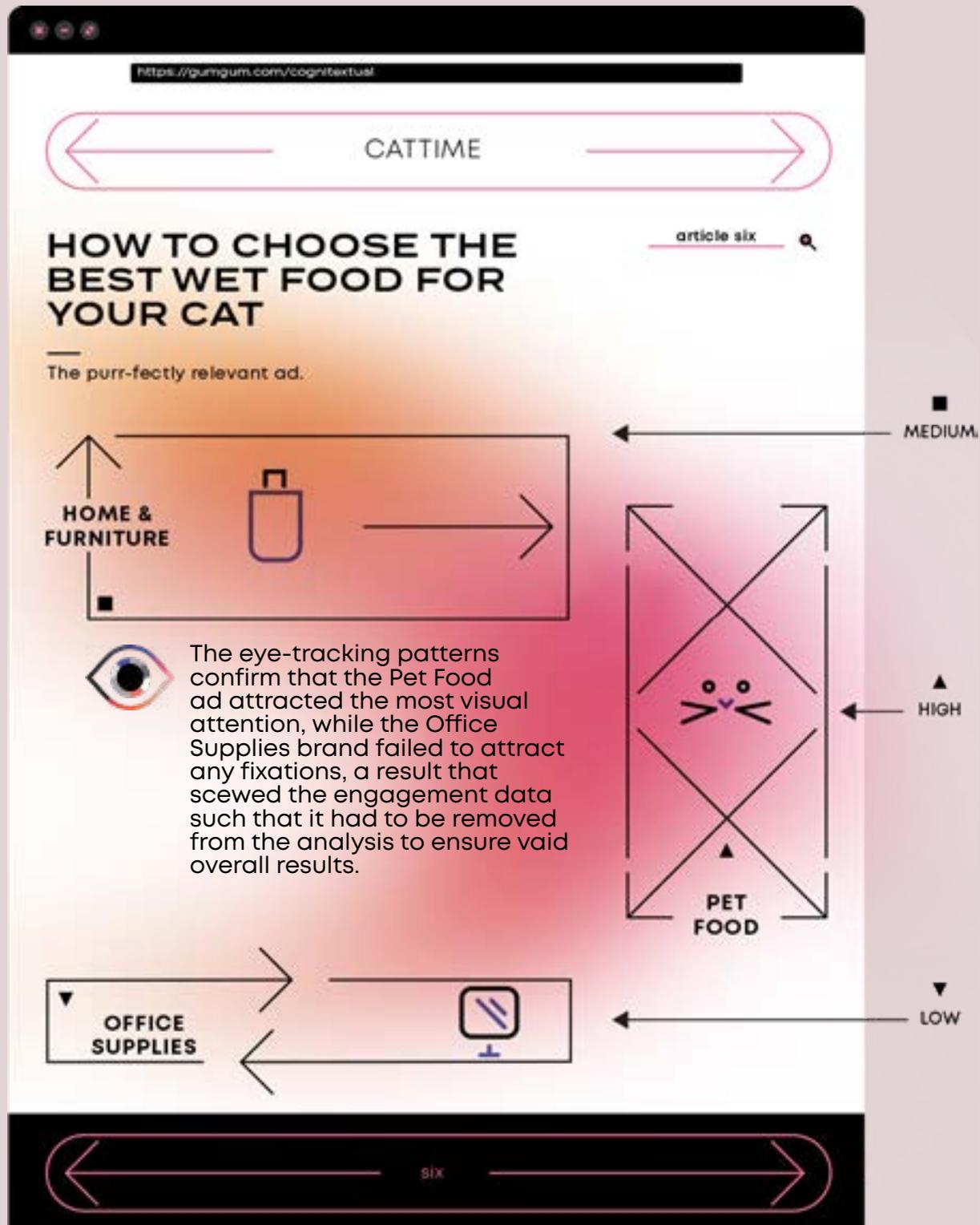| Context	▲ HIGH	■ MEDIUM	▼ LOW	● Overall Memory Rank

Health Magazine
/ The exception that proves the rule

In this case, the medium contextually relevant drove higher memory than the highly relevant ad, a sign of the ad's visual appeal, popular brand and highly visible In-Screen placement.
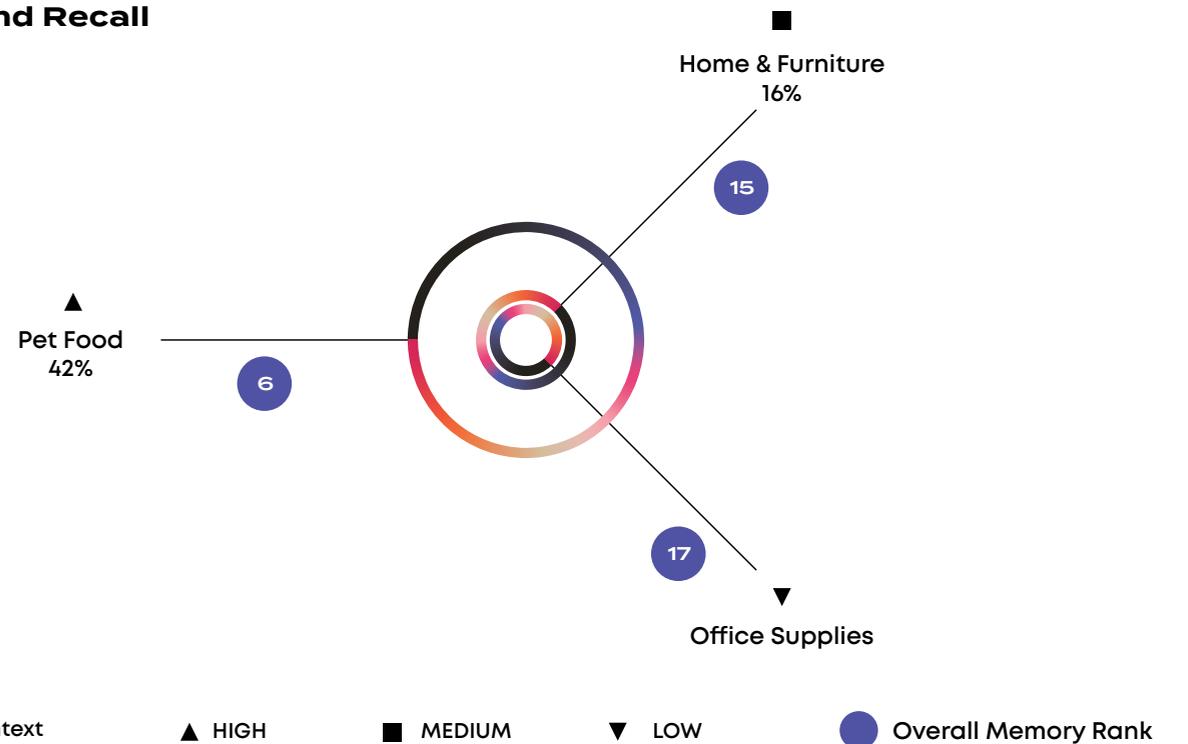
Context #6

The eye-tracking patterns confirm that the Pet Food ad attracted the most visual attention, while the Office Supplies brand failed to attract any fixations, a result that scewed the engagement data such that it had to be removed from the analysis to ensure vaid overall results.

Neural Engagement

Pet Food — 5.25% ▲

Home & Furniture — 4.50% ■

Office Supplies — -- ▼

Brand Recall

Home & Furniture 16% — 15

Pet Food 42% ▲ — 6

Office Supplies ▼ — 17

| Context	▲ HIGH	■ MEDIUM	▼ LOW	● Overall Memory Rank

CatTime
/ A purr-fectly relevant ad

A cat food brand ran a highly relevant banner ad on an article about choosing the right wet food, generating the best memory and visual attention of any of the three ads on the page.

About us

GumGum is a technology and media company with a focus on computer vision and natural language processing. Our mission is to solve hard problems by teaching machines to see and understand the world. With over a decade experience applying advanced machine learning techniques, we have become proficient at extracting value from text, images and videos. Since 2008, we have applied that expertise in a variety of industries from advertising to professional sports.

For advertisers, we offer a full suite of pioneering future-proof solutions. Our multimodal contextual advertising technology – Verity – gives publishers and brands a comprehensive understanding of web content in order to safely serve contextually relevant ads where users are most likely to see them. Combining that contextual targeting and brand safety intelligence with our proprietary ad formats, GumGum's advertising solutions are trusted by the majority of Fortune 100 companies to deliver industry leading efficiency, accuracy, and performance.

GumGum is based in Santa Monica, California with 21 offices across the US, UK, Canada and Japan.

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The Leader In Contextual Relevance
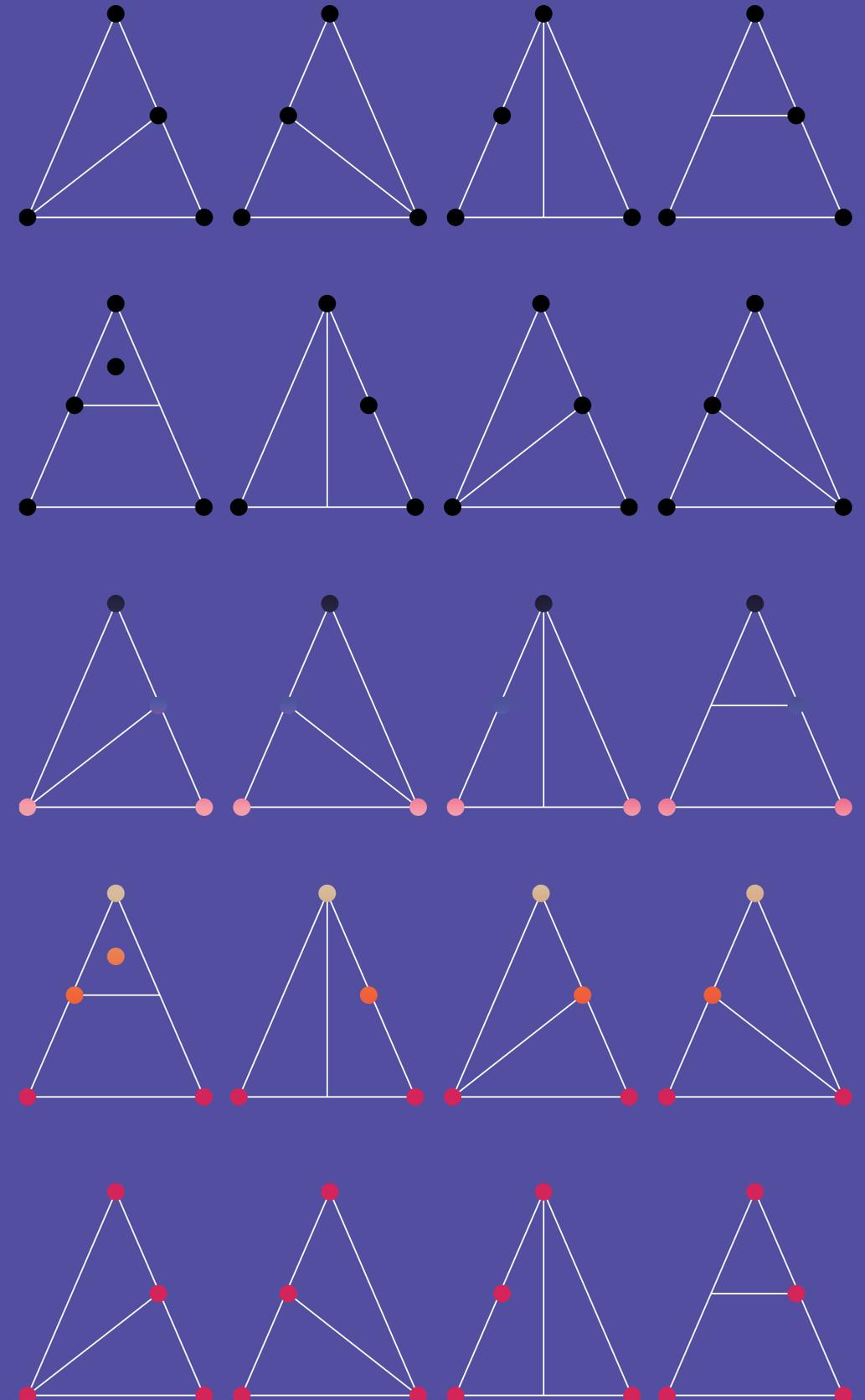
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