



ATTENTION TIME: REDEFINING HOW MARKETERS MEASURE AND OPTIMIZE ADS IN REAL TIME



TABLE OF CONTENTS

 A Note from Playground XYZ	3
 Executive Summary	5
 Methodology	8
 Part I: Being Seen vs. the Opportunity to Be Seen: The Battle for Eyeballs in Mobile Advertising	10
 Part II: Attention Time Proves More Important than Viewability	15
 Part III: Steps to Achieving Attention Time Measurement and Optimization in Real Time	18
 Glossary of Terms	23
 Sources	24



A NOTE FROM PLAYGROUND XYZ



Dear Marketers,

We understand that today's advertiser needs the attention of their audience, but they also face the challenge of competing with thousands of other brands, people, content and information for that finite and precious resource that is the human attention span. This has created a paradigm, known as the Attention Economy, in which consumer attention is a scarce and valued resource.

We know that brands and agencies are very advanced in the way they think about strategy, data, targeting, and messaging on mobile. But all of that great work and thoughtful planning can fall short at the 'final mile' – whether or not your ad is actually looked at. With consumer time spent using mobile officially overtaking linear television this year, the stakes have never been higher.

Capturing and measuring Attention on ads has been difficult to quantify - a challenge that has accelerated both the good and bad actors in the Attention Economy. Today's consumer has too many ways to actively or passively avoid viewing or interacting with sponsored content. They can skip, block and close ads, or simply choose to look away. For many marketers, the response to this deficit in attention is to be louder than their competitors by choosing increasingly disruptive placements, building frequency via aggressive retargeting tactics, or both. But is this type of advertising really the answer?

With mobile now the channel where consumers spend the bulk of their time, it's more critical than ever for marketers to try new approaches to cutting through the clutter of ineffective mobile ads to get more out of each contact with their audience. In order to do that, marketers must be measuring the right signals to determine whether their content is getting the desired reaction. Doing so requires an enhanced understanding and a new level of fidelity in measuring how a particular campaign has performed.

Playground XYZ spent close to four years building what we considered to be great "attention grabbing" ad formats. However, when we tried to assess the value they were creating, we realized that the tools being used weren't up to scratch. Viewability told us whether half of our ads made it into the viewport for one continuous second, and Engagement or Click-Through Rate informed us of the (quite frankly) tiny percentage of people that wanted to take action right then and there. There was an evident chasm between these metrics, and that's where we felt the construct of true attention lived. We wanted to understand which ads were actually looked at, for how long, and what impact this had on key brand metrics.

That's where an exciting new custom metric called Attention Time comes in. Until now, mobile eye tracking at scale has been cost and time prohibitive. Using cutting-edge machine learning techniques and a privacy-compliant, opt-in panel, we've started to fill a crucial gap in the way we'll assess and optimize ad effectiveness for our clients moving forward.

With this new capability, we've gathered some valuable insights which we hope will contribute to a growing body of knowledge around attention measurement. We thank you for downloading this free research, and we hope it helps your marketing efforts. To find out more about how Playground XYZ is leading the art and science of maximizing consumer attention, visit us at <https://www.playground.xyz>

Best regards,

A handwritten signature in grey ink, appearing to read 'Rob Hall', with a large, sweeping initial 'R'.

Rob Hall
CEO
Playground XYZ



EXECUTIVE SUMMARY

Attention has always been integral to determining the value of a brand's investment in paid media. However, while the traditional metrics on which marketers make advertising decisions are a good start, they don't give us the full picture.

The industry standard for Viewability, backed by the Media Ratings Council (MRC) and the Interactive Advertising Bureau (IAB), states that at least 50 percent of an ad's pixels be in view for at least one continuous second (or for video, 50 percent of a player must be in view for at least two continuous seconds). In August 2017, WPP's GroupM, the world's biggest media buyer, took this a step further by announcing custom, heightened standards for ad viewability.

The move highlights the call by major advertisers and large brands for more sweeping change in digital advertising standards and in greater transparency from publishers and the ad ecosystem as a whole. It also underscores changing mobile content consumption habits, with consumers rapidly swiping or scrolling through mobile feeds in an effort to tune out unwanted ad content. According to Marketingland, "A major concern when viewability standards were first being considered was ads being served 'below the fold' on desktop. Today, it's the speed with which users fly past in-feed ads on their phones, as well as questions of viewer intentions with autoplay video ads."

With Viewability amounting to one second of half an ad flashed across a small, rapidly scrolling screen, it's easy to see a growing gap between the opportunity to be seen and actually being seen.

As this research sets out to prove, the mobile ad measurement system is lacking for several reasons. There is a fundamental blind spot between Viewability (as defined by IAB) and actually being seen -- what we refer to in this paper as **Attention Time**. Based on our own experiences quantifying the performance of branded content, we believe there's a need in the industry to establish a more pure, human and attention-centric approach to measure ad effectiveness.

Attempts at using eye gaze measurement technology to determine consumer attention in that critical "last mile" phase has been largely based on artificial lab environments. Capturing Attention Time on an ad has lacked a reliable, scalable model. In the average eye tracking test, the test subjects don't use their mobile devices the same way they would in a real-world scenario, often wearing cumbersome headsets to conduct the testing, so results can be skewed and inaccurate. In a new wave of developments, the first smartphone camera-based eye tracking solutions have started to appear and these have the potential to solve many of the above challenges.

The results of this research leave us with a question: if it can be proven that Attention Time is a better predictor and influencer of driving brand outcomes, what actions can marketers take to implement a mobile ad strategy that is designed, measured and optimized by how long consumers actually make eye contact with their advertising content?

Playground XYZ's research shows that Viewability as a benchmark supplies only a portion of the larger attention measurement story. When the focus moves to measuring if, and for how long (i.e. Attention Time), a user is actually looking at advertising content, we start to see stronger progress against key brand outcomes.

Independent firm Kantar verified the accuracy of the statistical calculations used when analysing the brand studies contained in the report. Key data points from this research include:

Campaigns with any Attention Time drove an average **25% increase in Awareness** in the Exposed test group compared to Control group subjects, with one campaign achieving **as high as a 117% increase in Awareness**.

The more Attention Time, the more pronounced the Awareness outcome. In one campaign, Awareness moved from 30% for consumers with an Attention Time of under 10 seconds to 52% for 10-20 seconds and 67% for more than 20 seconds. In other words, the chance of achieving a lift in **Awareness increased by 11% for each additional second of Attention Time achieved**.

Campaigns in which the Exposed group achieved any Attention Time resulted in an average **79% increase in Recall** compared to the Control group, with one campaign achieving a **147% lift in Recall**.

The longer the Attention Time, the more pronounced the Recall outcome. One campaign moved from 48% Recall for 0-10s Attention Time to 52% for 10-20 seconds, and 76% for more than 20 seconds. This means the chance of achieving a lift in **Recall increased by 7% for each additional second of Attention Time achieved**.

Using a statistical model that isolates the importance of different variables, when compared to Viewability, **Attention Time was found to be 7.5x more predictive an ingredient of driving Awareness and 5.9x that of Recall**.

The result of this series of tests shows that marketers should consider Attention Time a vital new KPI.

Optimizing creative, formats, placements and publishers to maximise not only viewability, but actual visual engagement on an ad, will have a profound impact on brand outcomes.

METHODOLOGY

Our advanced, purpose-built eye tracking app.

To complete the eye tracking, we developed a deep-learning eye gaze inference model that runs on the mobile device to conduct eye tracking using standard camera-sourced pixel images.

To date, the implementation of this type of mobile eye tracking has been challenging due to the variety of individual appearances, head and hand positions, plus lighting environments that can be encountered. To train the eye gaze model, our machine learning engineers applied a deep convolutional neural network (CNN) architecture to a training set of 3,671 opt-in, crowd-sourced users who played a purpose-built mobile game and consented to their face images being used. In total we collected 754,600 photos with an associated known point of gaze. Through iteratively adapting the model's layer weights to maximize model accuracy (known as convolution), the model developed an implicit understanding of the non-linear relationships between the photographic features captured by the camera and the person's estimated point of gaze.

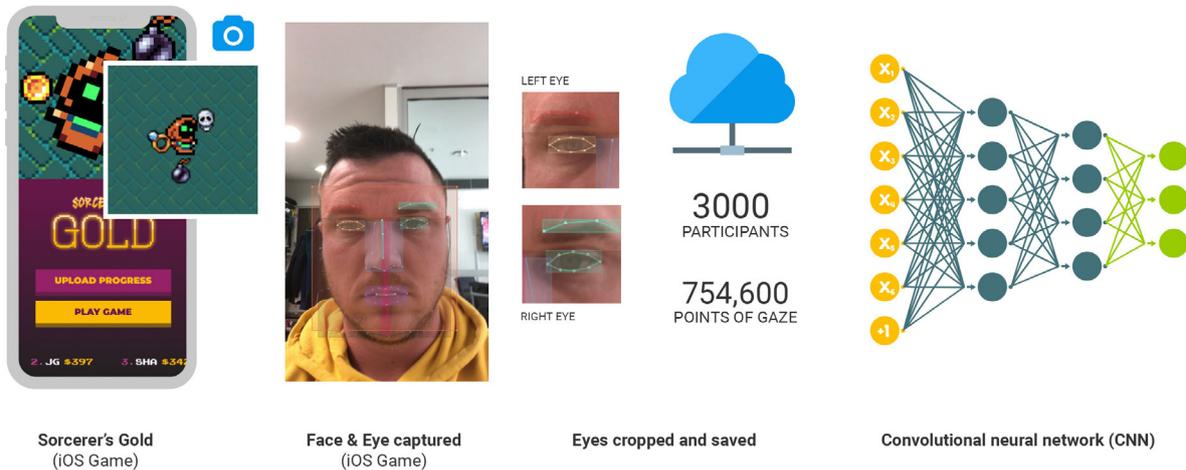


Figure 1: Collection and use of training set of data for mobile eye gaze model.

The eye gaze model was then integrated with the web browsing app that was used for the market research tasks. It is worth noting that the technology was built so that there is no longer the need to take images of participants' eyes off the device, instead now only sending the X/Y coordinates to our servers. This involved a solution that runs the eye gaze model on the user's phone - a feat of engineering, but an important feature in today's privacy conscious landscape.

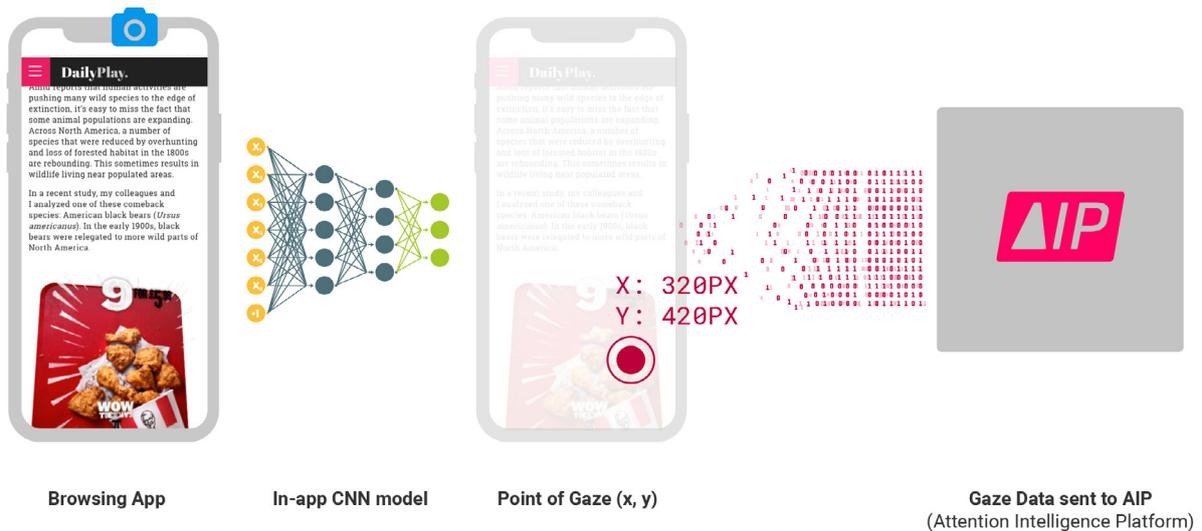


Figure 2: The browsing app for panelists features an eye gaze model that runs on device - extracting only the gaze coordinates to protect user privacy.

Running the study

We conducted seven separate studies in 2019 using proprietary eye tracking technology to measure the impact of making eye contact with mobile advertisements (a.k.a Attention Time). The study involved a set of seven leading blue chip advertisers.

Acquisition of test subjects was completed through partnerships with market research companies. To qualify, panelists were asked to complete demographic as well as mobile device ownership questions to ensure they met the target audience and device requirements. Panelists also needed to confirm their willingness to download an application to complete the experimental task involving mobile device eye tracking. Upon qualification, the panelists were randomly assigned to either the “Control” or “Exposed” groups. In total there were 1246 panelists - 555 in the Exposed group and 691 in the Control group.

The Exposed group was then provided with the download link and access code for the Playground XYZ web browsing app. Panelists using the app read a variety of news and lifestyle content articles. Within this content, Playground XYZ intermittently served ads from each of the seven participating brands, while capturing the Attention Time when panelists’ eye gaze fell on the ad, alongside other metrics such as Viewability and Frequency. The served ads covered a variety of high impact, custom formats from Playground XYZ including the SuperSkin, HangTime, HitchHike and Hoverboard.

The eye tracking technology was activated for 12 minutes while the Exposed group read the articles. At some point within the next 24 hours, the Exposed group was asked to complete a short brand survey that measured major brand outcomes.

Meanwhile, the panelists who were randomly assigned to the Control group were asked to complete the same brand surveys as the Exposed group, establishing a baseline for assessing the comparative uplift.



PART ONE

BEING SEEN

VS

**THE OPPORTUNITY TO
BE SEEN**

**THE BATTLE FOR EYEBALLS
IN MOBILE ADVERTISING**

Advertisers are painfully aware of the scarcity of attention. According to a 2015 study by Microsoft, the average human being has an attention span of approximately eight seconds. Additionally, we have now reached the point at which smartphones have overtaken television as the dominant channel for adults in the U.S. Consumers, bombarded with app notifications, texts and emails, spend about five hours per day looking at their smartphones and approximately 70% of all web traffic is now generated by mobile devices.

However, advertisers have been slow to implement solutions to this attention challenge. When mobile advertising first entered the mainstream, the accepted measurement benchmark, Viewability, seemed like enough to let marketers know whether their media buy was cost effective and their content was resonating. But that was before the rise of things like bots, more linear page layouts with infinite scroll and small sticky placements that perpetually cover a small percentage of the screen. Viewability only tells marketers that 50% of a brand's ad has indeed made it into the device viewport for the requisite one continuous second. It doesn't mean that an individual made eye contact with the ad.

To illustrate this challenge, consider the below advertising examples:

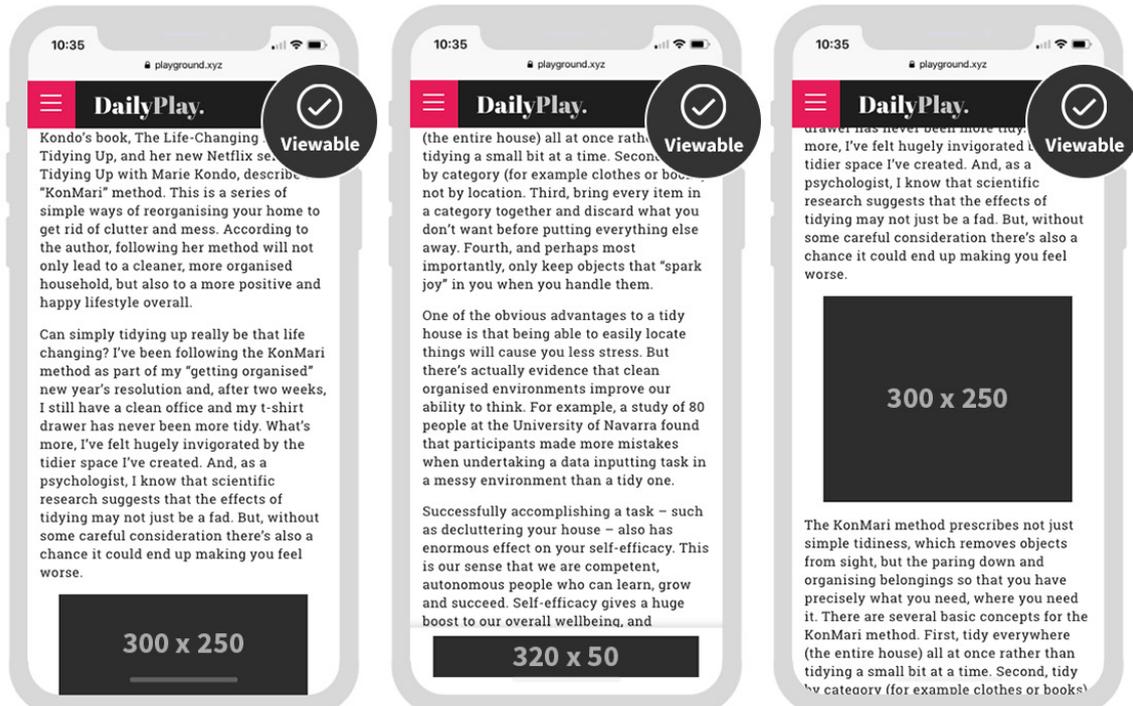


Figure 3: Examples of different 'in-situ' common ad formats and placements on mobile

Example 1 features a 300x250 ad with more than 50% of its pixel 'in view' - which would be considered 'Viewable' by industry standards.

Example 2 features a 'sticky' 320x50 ad that anchors itself to the bottom of the viewport for the entire time the consumer is on the page - this would also be 'Viewable' by industry standards.

Example 3 features the original 300x250 ad now 100% in view, which would also make it 'Viewable.'

So which example would have delivered the most attention?

The answer is, we don't know if any of them were actually looked at.

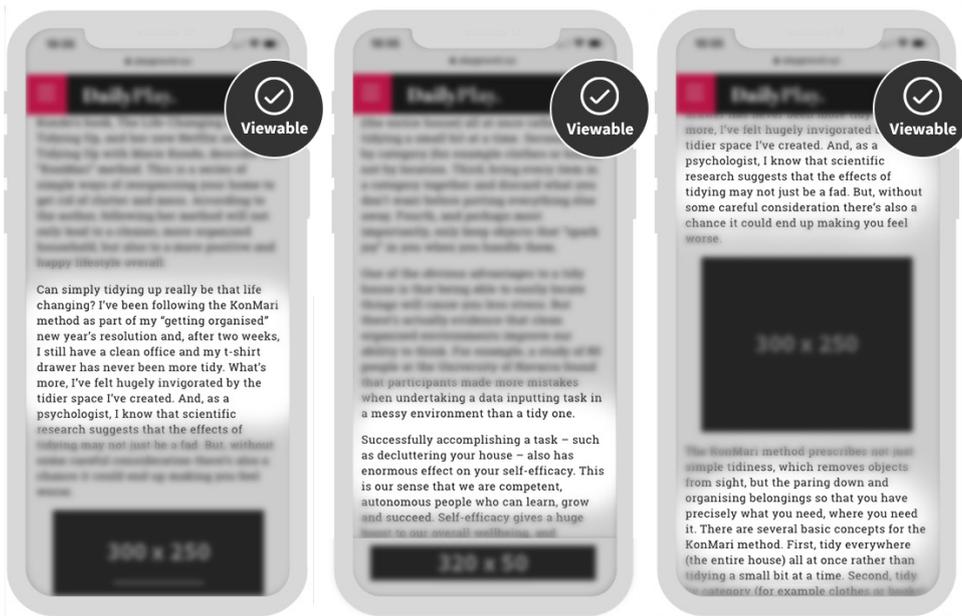


Figure 4: Examples of potential points of gaze / attention on the screens.

It's clear that in the Attention Economy, the opportunity to be seen just isn't enough. In the race to capture and maintain consumers' attention, marketers are now learning that Viewability cannot reveal the whole story.

A powerful metric for the Attention Economy

What is Attention Time, and why should marketers care about this metric? Quite simply, Attention Time is the amount of time (in milliseconds) a viewer spent making eye contact with an ad.

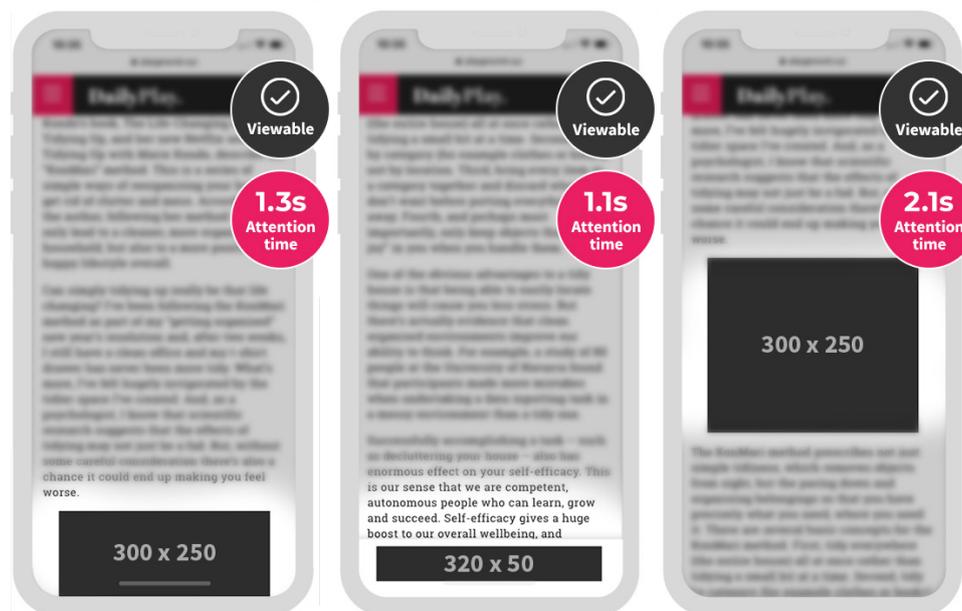


Figure 5: Example of an eye gaze resulting in Attention Time on advertisements.

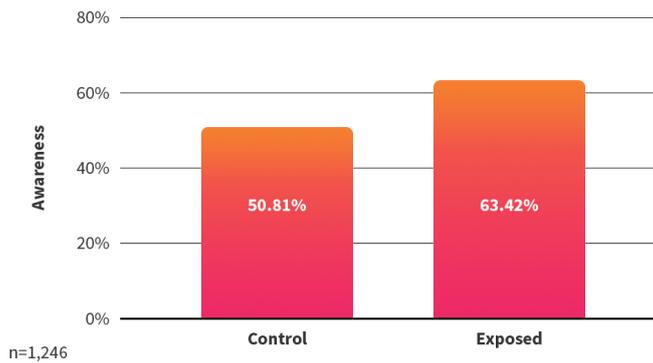
Using our purpose built technology and panel, we were able to capture Attention Time across the test campaigns. Playground XYZ's research proved the following:



INSIGHT 1

Campaigns with any Attention Time drove a large increase in Awareness and a huge increase in Recall.

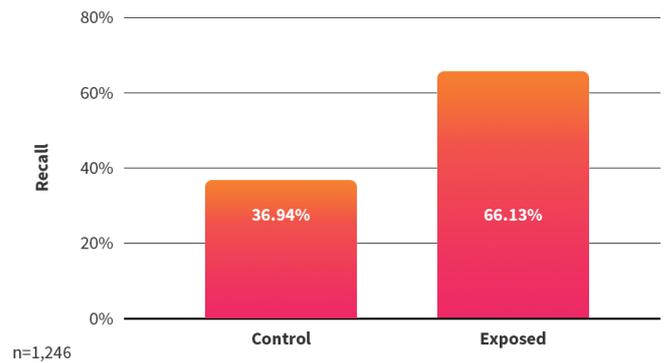
Effect of any Attention Time on Awareness



As the data shows, there was significant movement in Awareness among those panelists who looked at the ad, achieving an aggregate 63.42% in awareness for the brands vs 50.81% from those in the control, equating to **an average increase of 25%**. One campaign in particular achieved as high as a 117% increase in awareness.

The changes to Recall were even more pronounced than Awareness, with the exposed group achieving 66.13% vs the control group result of 36.94%, equating to **an average increase of**

Effect of any Attention Time on Recall



79% and with one brand achieving a huge 147% increase.

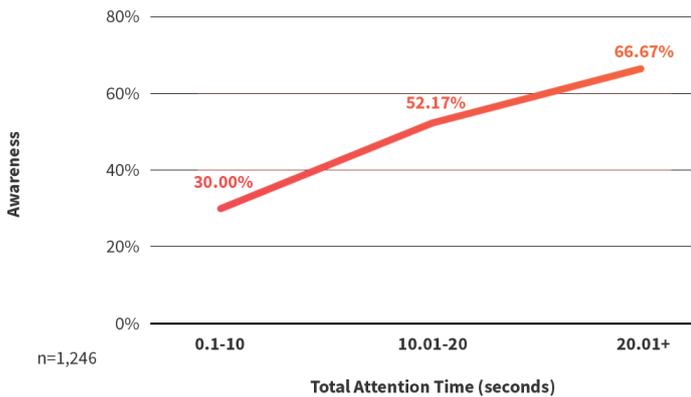
These results lead us to the (not so startling) fact that a validated gaze or proven look at an ad drives these key brand outcomes. However, looking or not could be argued to be too binary a measure - looking for a second might invoke different behaviors than looking for multiple seconds. So we looked deeper into the effect the length of Attention Time had on brand outcomes.



INSIGHT 2

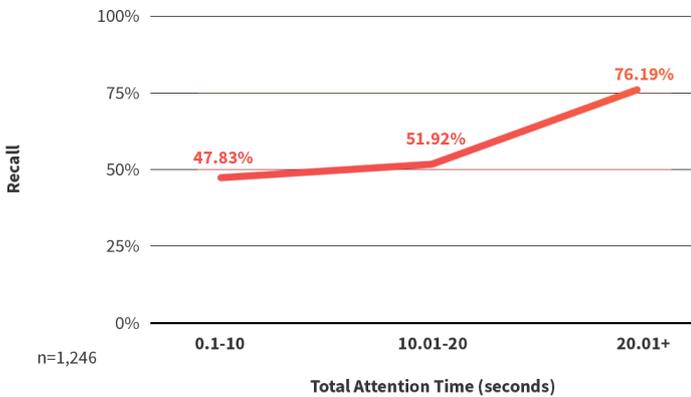
The longer the Attention Time the greater the increase in Awareness and Recall.

Effect of ongoing Attention Time on Awareness



The total length of Attention Time a creative achieves has a strong role to play in driving Awareness further. For instance, in one campaign, awareness moved from 30% for Attention Time under 10 seconds to 52% for 10-20 seconds and 67% for greater than 20 seconds. For this particular brand, **for each additional second of Attention Time achieved, the chance to increase Awareness grew by 11%.**

Effect of Attention Time on Recall



Similarly, the total length of Attention Time a creative achieves has a strong role to play in driving Recall. For instance, in one campaign, Recall moved from 48% for 0-10s Attention Time to 52% for 10-20 seconds, and 76% for Attention Time over 20 seconds. This means that for **each additional second of Attention Time achieved, the chance of increasing Recall rose 7%.**

The research underlines the relationship between Attention Time and the standard brand outcomes and it also shows the power of extended Attention Time.



PART TWO

ATTENTION TIME PROVES MORE IMPORTANT THAN VIEWABILITY

It's not surprising to learn that the longer a consumer holds their eye gaze on a mobile ad (provided it is voluntary), the better the brand outcome. It's common sense, really. However, our research takes this concept a step further by demonstrating that Attention Time as a variable outperforms the industry standard variable of Viewability - which to date, has been our best proxy for attention.

As part of this experiment, Playground XYZ's data science team created an XG Boost model, to predict brand outcomes from the campaigns (Awareness and Recall) using the measurement variables of Attention Time, Viewability and Frequency.

XG Boost models implement the gradient boosting decision tree algorithm where multiple, diverse models are layered on top of each other to minimize prediction errors. Boosting models often deliver superior performance over traditional linear regression algorithms because they can better model non-linear data relationships.

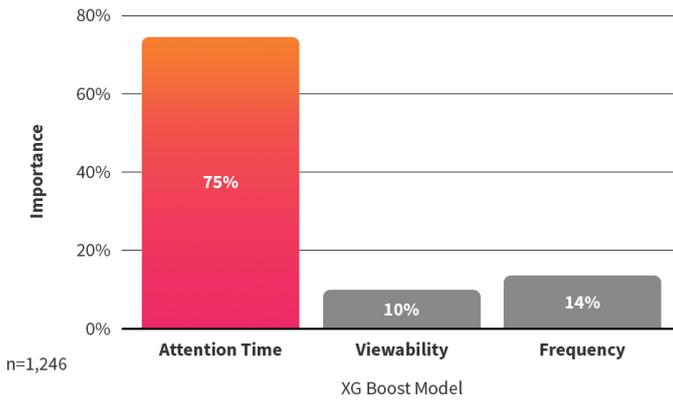
Another benefit of XG Boost models is that they support a feature importance algorithm. The relative accuracy gains achieved by each variable are calculated by sequentially introducing each individual variable into the model, and recording the change in model accuracy. The variables that achieve the highest accuracy gains are deemed to have the highest relative importance in predicting the relevant brand outcomes.



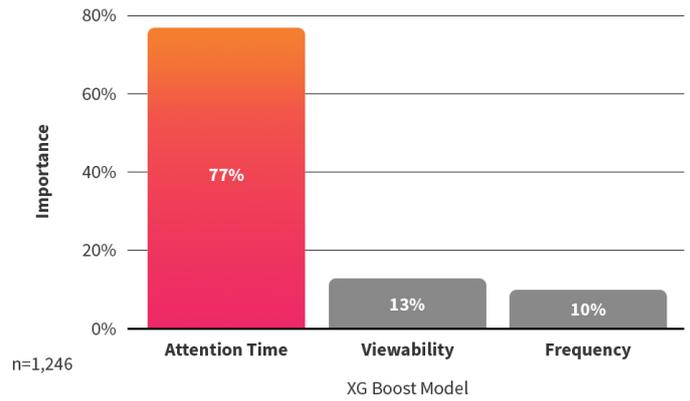
INSIGHT 3

Attention Time is more powerful than Viewability in driving Awareness and Recall

Importance of Variables in Predicting Awareness



Importance of Variables in Predicting Recall



*All numbers rounded to nearest percentage point

Our research shows that Attention Time **was found to be 7.5x more predictive an ingredient of driving Awareness compared to Viewability and 5.9x that of Recall.**

There is an undeniable trend emerging from the data that has been uncovered so far. When it comes to driving Awareness and Recall there is no better single metric to be focusing on. The best part is

that it's intuitive; it isn't difficult to comprehend how looking at an ad, for an extended time, drives greater outcomes than the ad merely being on the screen. This is why Attention Time is a very pure and human metric that will have an attraction for advertisers into 2020 and beyond.

“

Consumer attention is something we always try to quantify on our campaigns; however, we know that measures like Viewability don't give us a true picture of who looked at our ad. We were very excited to utilize this new product from Playground XYZ to capture actual Attention Time on our campaign.

The results showed us how Attention Time is a very potent metric to drive our brand outcomes and it's definitely something we'll be using moving forward.

Matt Richards,
KFC Performance Marketing Manager

”



PART THREE

ACHIEVING ATTENTION TIME MEASUREMENT AND OPTIMIZATION IN REAL TIME

In the past, running eye tracking studies usually culminated in a report that would then need to be analyzed, de-constructed and broken down into strategies and tactics that marketers applied to their next campaign.

The hardware challenge of needing expensive eye tracking headsets has been removed by the advancement of front-facing cameras on smartphones. This, combined with the rise of machine learning/convolutional neural network-based techniques that power gaze prediction models such as ours, means the ability to conduct eye tracking research on mobile has taken a huge step forward. Provided there is a very stringent privacy compliant, opt-in process in place, there is now a cost-effective and less time-consuming way to run these studies at scale.

What's more, by building an infrastructure that allows the panel to communicate with analytics systems and media buying platforms, there is the opportunity to link the systems together and make the insights truly **actionable in real time.**

With the participating brands, we set out to learn whether we could gather enough data and features from the panel to inform an optimization algorithm that enabled us to drive the Attention Time of their media buy up.

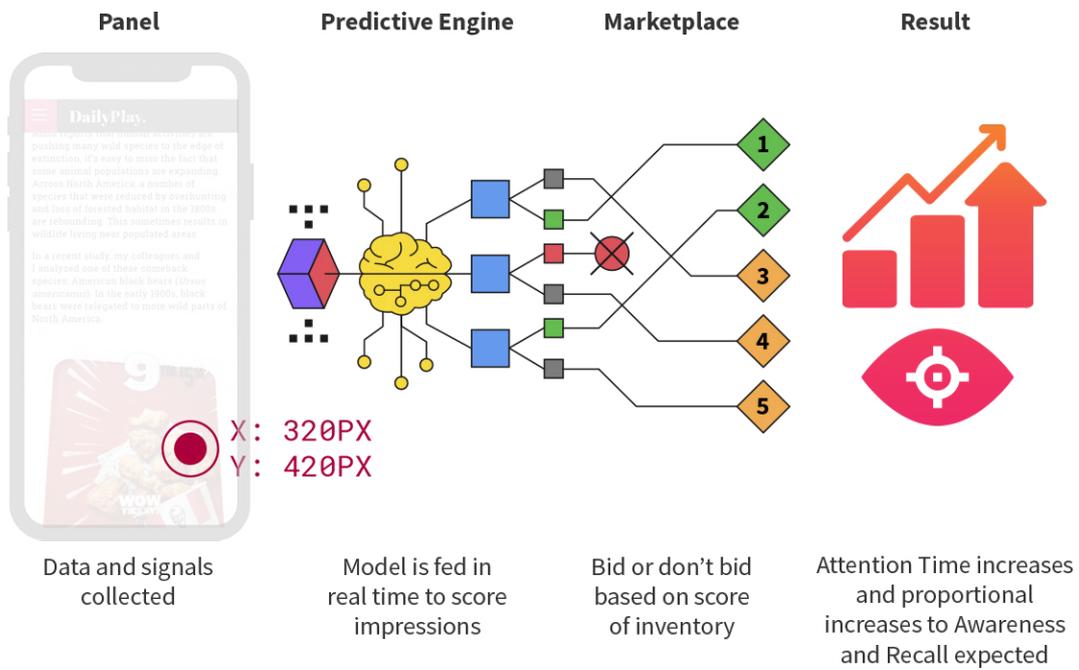


Figure 6: Integrated ecosystem from panel marketplace to drive outcomes

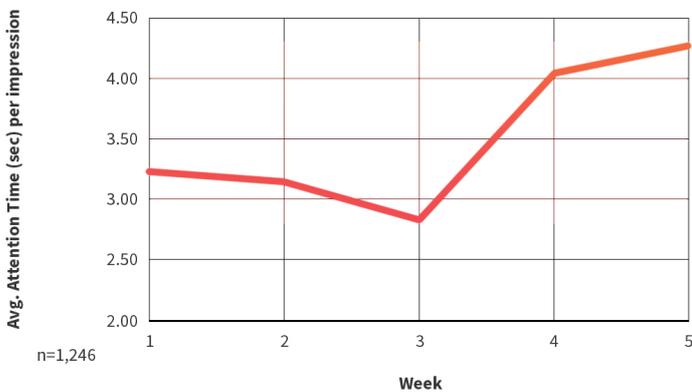
Our panel captured eye tracking along with a multitude of other signals such as the content type, page length, placement, format, advertiser vertical, scroll direction, scroll speed, time of day, day of the week and more, and combined these into a model. This model was then put into our ad server, which allowed the real time bidding (or not) on certain impressions that we deemed worthy.



INSIGHT 4

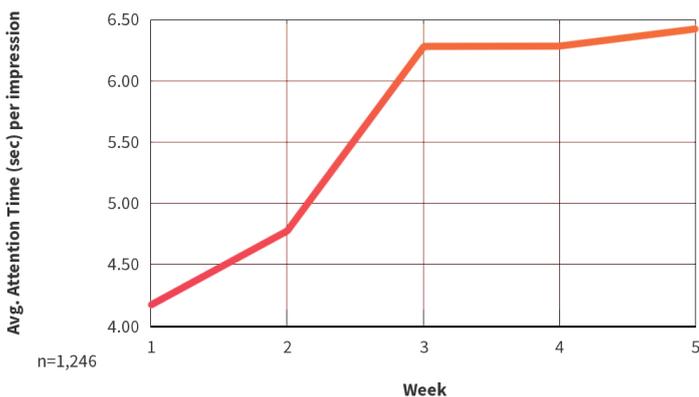
It is possible to optimize Attention Time higher in real time.

Optimized Attention Time (Sec)



Though our optimization algorithm, the average **Attention Time per impression for one campaign grew from 3.23s in week one to 4.27s by the end of week 5, an increase of 32%.**

Optimized Attention Time (Sec)



In another of the sample campaigns, we were able to **increase Attention Time from an average of 4.17s per impression in week one to 6.42s by the end of week 5 - an improvement of 54%.**

These results open up a fascinating new world of potential. As media buying evolves to programmatically optimize to true attention-based signals like Attention Time, inefficiencies will be stamped out and return on investment increased.

“

“We were pleased to partner with Playground XYZ to produce a high impact mobile campaign to raise awareness and recall of the SUV range. Using their new eye tracking and measurement tool allowed us to really see how Attention Time can move the needle on both awareness and recall, both of which were integral to our campaign.

The campaign performed really well and the study produced some interesting results, demonstrating that optimising towards Attention Time led to an increase in our metrics vs just optimising to Viewability”.

**Joanne Ross,
Peugeot Communications Manager
2008, 3003, 5008 ranges**

”

FINAL THOUGHTS



Attention Time has the potential to fill a crucial gap in the way marketers optimize ad effectiveness and build a stronger brand with target consumers.

This project, over a year in the making, took our data scientists and partners on a journey of exploration that has spanned many new technical feats; the ability to conduct decentralized eye tracking on mobile devices, an enhanced understanding of the science behind user attention, and new ways that these insights can be implemented in real time on media buys.

As a result, we've been rewarded with some excellent insights, but they certainly aren't exhaustive. The truly exciting part is that we now have a custom-built platform to continue this learning, and we'll continue to conduct more research and share with our marketing audience.

For now, what should media buyers, advertisers, and publishers take away from this research and act on? Here are a few important considerations:



Viewability as a metric remains useful, however isn't the most pure signal.

This research doesn't suggest that advertisers dump Viewability altogether. It is still a good, widely available method to have a "first line of defense" against wastage. However, there are many examples of ads that have a high Viewability score, but are proving to have little to no Attention Time. Do your homework to understand what these are and then invest in deeper metrics such as Attention Time to tell the full story and drive better outcomes.



Consider strategies for building Attention Time.

If, as the research shows, the longer eye contact is maintained, the better the brand outcome, then the goal should be to deliver ads that keep consumers' eyes engaged for as long as possible. Marketers must push beyond simply optimising to Viewability and strive for longer visual engagement. This means creating ad experiences that get an enticing message across, while at the same time resisting the urge to use brute force tactics to cut through. Look for creative, formats, placements and publishers that deliver the best Attention Time without sacrificing the user experience.



Action your insights.

As mobile eye tracking options become increasingly available, advertisers will be able to take advantage of this powerful tool more often and these valuable insights will help shape everything from strategy to execution. However, if this data takes the form of a report it means time to deconstruct, break down and implement - all of which come with an opportunity cost. Don't settle for waiting until your next campaign to execute - look for agile vendors and partners that can help you implement the changes, ideally in real time.

GLOSSARY OF TERMS

Attention Economy

An approach to the management of information that treats human attention as a scarce commodity, and applies economic theory to solve various information management problems.

Attention Time

The amount of time an individual gazes or spends looking at an advertisement or sponsored creative. Measured in milliseconds.

Awareness

The percentage of customers who demonstrate awareness of a brand's offering. In the case of this study, aided Awareness was tested by asking participants questions such as "Which of the following brands are you aware of offering? Select all that apply."

Eye Gaze

The direction or point where a person is looking.

Eye Tracking

Technology that infers the panelist's point of gaze using sensor data and software.

Frequency

The number of times a person is served an advertisement from a specific campaign.

Recall (or Brand Recall)

The percentage of potential customers who remember seeing the advertisement within 24 hours of the viewing. In the case of this study, Recall was tested by asking participants questions such as 'Do you recall seeing any advertising for the following brands during the past 24 hours? Select as many that may apply.'

Viewability

The concept of how visible ads on a website or mobile app are to users. For an ad to be considered "viewed", at least 50% of the banner or creative must display in the viewport for at least one continuous second, as defined by the Internet Advertising Bureau's (IAB) standard for what consists a viewable impression.



SOURCES



- 1 AdWeek, Why Mobile and Consumers Are the Focal Points of This Year's New Fronts, May 2018
- 2 eMarketer, Average US Time Spent with Mobile in 2019 Has Increased, June 2019
- 3 Marketingland, GroupM sheds light on its updated viewability standards for display & video ads, August 2017
- 4 The Telegraph, Humans have shorter attention span than goldfish, thanks to smartphones, May 2015



ABOUT PLAYGROUND XYZ



Playground XYZ is on a mission to master the art and science of maximizing consumer attention. The company has built the world's first technology stack that integrates visual attention measurement, analytics and media optimization called the Attention Intelligence Platform. It powers a suite of leading products that maximize Attention Time for brands. Headquartered in Australia, Playground XYZ has offices in Singapore, the United Kingdom and the United States. For more information visit <https://playground.xyz>