Gorilla in the room

Giving attention a little attention

Dr A Goode

Foreword

Is attention the missing link in media measurement? Is it the vital piece of the advertising effectiveness jigsaw that will complete the picture?

A recent surge in global interest in advertising attention measurement suggests it could be, and this interest has forced an industry-wide rethink of legacy media metrics.

The focus on attention was instigated by the inability of online measurements – like impressions, video starts or viewability scores – to act as effective indicators of online ad exposure and how ads are landing with consumers. More recently the debate has widened to encompass other channels – including TV.

In 2021, Thinkbox undertook a global consultation with key attention practitioners to probe the theoretical underpinnings of attention's application within the advertising process, and to better understand the research methodologies currently being used to measure attention.

This consultation led us to the conclusion that, before commissioning bespoke research into the application of attention to TV planning/implementation, it was important to gain a deeper understanding of current thinking by commissioning an independent review.

In particular, we were keen to understand how attention is understood in the academic cognitive science world and how this compares with its commercial application within media.

So that's what this in-depth paper – 'Giving attention a little attention' – is about. Undertaken by award-winning cognitive scientist Dr Ali Goode, it outlines current approaches to attention within the advertising and media industry and compares them with academic insights and theories.

The result is hopefully a valuable addition to the advertising attention debate, raising the potential for some course correction, and identifying some important areas that are yet to be incorporated into current thinking or fully understood.

Our ambition is to help advertisers and agencies use attention measures effectively, and to offer insights into what advertisers should focus on to enhance the impact of their advertising.

Anthony Jones
Head of Research, Thinkbox

Introduction

In 1759, the Diarist Samuel Johnson commented on the newspapers of the day that “Advertisements are now so numerous that they are very negligently perused” (Johnson 1810). It does leave one to wonder what Dr Johnson would have thought about advertising today with estimates that people can encounter thousands of adverts every day? Considering this, it is no wonder a focus on attention is becoming ever more a part of media and advertising effectiveness. Much has been written on the topic commonly from those who are using attention assessing technologies and other attention metrics to assess ad impact.

This paper aims to take a step back and take an objective view on where we are with the theories, measurements and ongoing application of attention metrics. The objective will be to draw on both business cases that have considered attention towards advertising, as well as academic research outlining what we know about attention from empirical study. The aim will be to understand how best to think about how we consider, think about and apply ideas around attention and consider its application to understanding advertising effectiveness. Further this paper will also set out what there still is to understand about how attention relates to both advertising exposure and impact.

Of key interest will be looking at where ideas on attention in business case studies overlap with what we know about advertising from empirical academic research. However, more importantly is where the application and understanding of attention differs to that of current business thinking and hence where there are opportunities to learn and move the understanding of attention and advertising forward. The output will be a set of observations about where attention in advertising practice can potentially be improved as well as outlining what we do not know about the topic and the questions that remain to be answered.

One key aim of this review is objectivity. We consider it important that the sources referenced within this paper are categorised into two kinds. Firstly, those papers that are peer reviewed, in that they have been published in an academic journal where they are critiqued by a panel of those who are also experts in that field, and revised accordingly, prior to publication. Secondly those that are published in journals where the results are not peer reviewed, so have not been subjected to any critical evaluation prior to publishing. This distinction is important as peer reviewed papers represent conclusions based on objective research assessed by others who are similarly knowledgeable in the field and have vetted the findings. In contrast non peer reviewed papers, though containing relevant information and insight, are authored by those who have the freedom to express opinion which can be influenced by them being financially invested in a certain perspective. (NB: Non peer reviewed papers will be indicated using an asterisk*)

Unique brand assets and creating mental availability

Mental availability is the propensity for a brand to be noticed and/or thought of in buying situations. This is not just the brand being top-of-mind; it is both the breadth and depth of perceptions about the brand coming to mind. In psychological terms this can be thought of as the brand's schema. This brand schema need not only represent ideas and concepts such as those that may be communicated by USP's or reasons to believe, but it also represents the emotional valence of a brand, the intuitive associations that a brand or buying situation might prompt and even more physiological functions such as gustatory responses to food or kinaesthetic actions such as gestures. It is brand-building activity that creates this mental availability which sales and activation activity can then exploit. Brand building sows the seeds; activation harvests them and are critical for brand growth.

This is not just a theory - various studies and analysis from Professor Karen Nelson-Field, Rob Brittain, Peter Field and Professor Byron Sharp have demonstrated that communications are key in building mental availability for brands and moreover attention to communications is a critical element of this.

Looking at the Advertising Council Australia's (ACA) effectiveness database, Brittain and Field have identified three driving forces behind the creation of mental availability: budget leading to excess share of voice, media selection, and which media spread is the most effective with TV commonly being the key driver and creative strength.

OMD have done work in this area (Nelson-Field 2021(1)*), suggesting a link between mental availability and attention. They claimed that attention drives mental availability and sales, correspondingly high attention platforms make a more significant contribution to Mental Availability. As Steven Piluso, EVP, MD, Strategy, summed up.

"Finding, creating and holding attention isn't the goal. The goal is it turns attention into action, to have a consumer choose your client's brand, over and over again, in any situation where they have a choice between that brand and the competition. That's called Mental Availability – owning the "front of mind" space where brand choice becomes an automatic reflex."

The focus on attention and advertising

There have been a number of projects in recent years that have focussed on attention and how it may be influential in advertising effectiveness, such as Dentsu Attention Economy Project (2021*), Ebiquity's 'The Challenge of Attention' (2021*), the work by Prof Karen Nelson-Field from Amplified Intelligence, author of 'The Attention Economy and How Media Works: Simple Truths for Marketers' (2020*(2)) and PWC's 'The battle for attention' (2018*).

The key shift this work argues for, is that traditionally, advertising in most media is bought on the basis of 'opportunity to see' rather than the actual attention they generate (IAB standards, 50% of the pixels on screen for 1 second or more by Follett (2018))*. In short, it is an acknowledgement that not all advertising is paid attention to. The argument is that advertising should be bought on the basis of a 'verified human view' rather than viewing opportunity alone (Nelson-Field, 2020(2)*), and if this is done, ad effectiveness can be found to increase.

This next section will review the definitions, approaches, measurements and assumptions behind attention measurement and application and review some of the evidence that has been published in terms of understanding its impact on effectiveness.

How attention has been defined

There are subtle differences in the way in which attention has been defined within these papers. Karen Nelson-Field (2020*) defined attention as concentrating awareness (even if fleeting) to a reduced number of stimuli in our environment while ignoring others. Ebiquity (2021*) extended this idea by pointing out three characteristics of attention that would impact on advertising. Firstly, that attention is about selection between many different options. Secondly, that attention is finite and gets 'used up' by the process of paying attention to things and finally, what gets looked at depends on a person's purposes, aims and beliefs. But the general consensus is that when people are looking at advertising as indicated by visual dwell time, this is an indication of attention.

How has attention been measured

Commonly in these approaches, new technology measures eye position and head position as a proxy for attention. Commonly quoted are companies such as TVision and Lumen who provide the metrics on which attention has been assessed. For assessment of digital content, companies such as Lumen use the front mounted camera on devices such as laptops and phones, to assess eye movements and broadly indicate where the eye is looking. These data are commonly reported in terms of fixations, (how often something is looked at) and dwell time (how long something is looked at for). Claims are made that 70% of eye fixations are within 0.5% accuracy. For attention to television adverts, TVision has a panel of 5,000 households in the US who install cameras on top of their TV's along with a box that

records what is on TV. The camera technology can measure when someone is in the room and if their head is orientated towards the television. Note that it does not measure eye fixations or dwell time (it is entirely possible for a person to have their head orientated with their eyes not fixated on the screen).

The key point that should be noted is that these systems clearly consider attention based only on what is being looked at, namely visual attention.

Another approach that has been used to measure attention is Artificial Intelligence. Companies such as Eyequant have developed Machine Learning solutions that predict where visual attention will be on images, web pages and adverts etc. The technology is based on a learning algorithm derived from real eye movements that approximates which areas will get the most visual attention. The drawback with this technology is that it can only indicate the visual attention based on the surface features of an image. In other words, the attention pattern indicated will not be based on any understanding of the meaning of the image, and will only indicate visual anomalies such as faces, areas of high contrast and words that we are innately drawn to pay attention to. It does not indicate how attention might move around an image if a person were paying attention to different parts of it in order to understand it in full. In effect, it indicates what would be looked at if a person was looking at a foreign language ad but did not speak the language the ad copy was written in, such as a native English speaker looking at a Japanese ad written in Kanji script.

Google (2017) took a different approach to attention. Despite also understanding visual attention through eye-tracking, they conducted additional video ethnographic research, putting cameras in homes, to establish behaviour around ad attention. A key focus were ads that were incorporated into YouTube. From this, they identified the concept of ‘Investment Signals’ to indicate attention, where people could be seen to change behaviour prompted by an advert. These included behavioural signals such as settling down, sharing or talking with someone in the room about the advert, or online behaviour such as reading comments and liking social media amongst others. Importantly a sub-category of ‘Investment Signals’ were termed ‘Device Signals’. This was where people actively changed their settings on a device in response to an ad. These could be clicking through, increasing volume / unmuting, restarting the video, rotating the device / maximising to full screen etc. What is important with these ‘signals’, is that they differ from gaze location and dwell time in one important consideration. As will be discussed later, Gaze does not always indicate active processing of adverts, it is possible to look in the direction of an ad and not ‘perceive’ it. Hence these Device Signals are likely to be an indication of a person being invested in the ad and not only giving it visual attention but also indicate active processing of an advert and hence the understanding of any message. Another significant advantage for these Device Signals is that they can be logged by the devices, these are also scalable across a campaign. Google though, do note that Device Signals are not a fool-proof measure as it would be entirely possible for attention to be paid without a Device Signal.

Even though ‘Investment Signals’ do not indicate all situations where attention may occur, Google’s idea of ‘Device Signals’ are a solution that could be both credible and scalable as a measure of active involvement with digital ads, most commonly with video content.

Findings about the application of attention metrics

As described previously, the application of attention to advertising has been derived from measures such as head and eye tracking, and hence are very much considerations of the impact of visual attention on advertising. This caveat aside, evidence has been provided that including these visual attention measures as part of predicting ad effectiveness has yielded positive results.

Green and Watson (2020*) using device-based eye tracking, reported that ads that were given visual attention during a test showed an uplift in recognition from 33% to 66% compared to when they were not looked at. Similarly measures of visual attention were shown to have an impact on short-term advertising strength (STAS) (comparing brand choice of category buyers who have and have not been exposed to brand advertising). Nelson-Field 2020 (3) reported an increase in STAS of 110 (no attention) up to a score of 127 when ads were given high attention. She also claimed that there was no relationship was found between STAS and attention, not brand recall.

The Dentsu Attention Economy project has shown that visual attention measured towards an ad, expressed as visual dwell time (how long an ad was looked at) was positively related to prompted recall (being asked to indicate from a list of brands, only some of which had been shown during an exposure phase) (Dentsu 2020*). In addition, they found this measure of attention also indicated increased brand choice. Notably, they acknowledge that the conditions under which ads are viewed can be influential. Choosing to watch an ad was reported as being of greater influence on uplift than a forced exposure (someone being made to watch an ad). They also note that attention is not equivalent across all media. Attention for a certain time in one media format may not correspond to similar effectiveness for the same time in another format. Finally, they conclude that there are differences in viewability and actual viewing across different media, with opportunities to see on some media formats leading to a greater number of actual views than others.

Similar to Dentsu, Google showed an effect for YouTube ads exposed with measured visual attention (Google 2021). Here, both aided and unaided brand recall were seen with increases with visual dwell time on the YouTube ads. In addition, they also showed that brand familiarity was a factor in brand memory. Ebiquity (2020*) reported similar results comparing how much visual attention ads got across different formats. Finally, using an attention adjusted share of voice measure was also suggested to improve the mental availability for brands (the ability for breadth and depth of perceptions coming to mind about a brand) (Peña-Taylor 2021)*.

Overall, the consideration of attention, mostly based on visual attention indicating actual views rather than opportunity to see has been reported as leading to positive outcomes for ad effectiveness.

It should be noted however that much of this evidence comes from the realm of digital advertising. Much of the focus has been on improving viewability metrics and, as described above, the improvements can be seen and measured. Results such as these have led to recommendations about advertising and media practices. It should be noted though that this is a specific exposure situation and that the findings may not automatically generalise to all media. The application of these results is discussed in the next section and the consideration of the focus on visual gaze as a proxy for attention.

Other neuroscientific and neurophysiological approaches have also been used to assess attention (see Venkatraman et al 2014 for a full review). They concluded that positive measures of attention can be derived from techniques such as head or desk mounted eye tracking, indicated by dwell time, fixation count as well as visual path analysis. They also suggested that Biometric measures such as Heart-rate deceleration and respiratory sinus arrhythmia (RSA) where heart rate variability in synchrony with respiration, the R-R interval on an ECG is shortened during inspiration and prolonged during expiration. They have also found positive results from EEG and fMRI studies. These include that, measured via EEG, occipital alpha activity is associated with attention. This could be the result of the suppression of visual input occurring in order to devote resources to short term memory encoding, hence indicating attention-based processing. They also suggested that fMRI studies showed activation in the Dorsolateral Prefrontal Cortex areas of the brain indicated attention, again this area is associated with attentional switching and higher cognitive functions such as short-term memory processing (Squire 2009). They also suggested areas associated with decision making such as the Ventromedial prefrontal cortex (Chib et al 2009) could also indicate attention. Peter Pynta from EEG based company Neuro-Insight suggested that visual attention only accounted for 15% of memory encoding and other factors such as storytelling emotion, frequency and context are commonly implicated in the remaining memory encoding. Other factors such as salience, distinctiveness and processing level are also likely to be involved.

The impact of the consideration of attention on advertising

Those who have been contributing to the debate on attention and advertising nearly all agree on its value in assisting ad effectiveness, though it should be noted the majority have considered visual attention. They agree that metrics that consider visual attention that assist in predicting actual views rather than impressions are more reliable predictors of sales. Application of these insights, models incorporating them into business practice and how to calculate and predict attention of course differ across organisations. However, outcomes using these kinds of approaches have led to a number of recommendations for ad display and creation.

Lumen have been able to identify best practice in digital ad presentation. Follet (2018)* showed a 10-fold difference between visual attention given to ads on The Times website compared to Gumtree. He cites overall dwell time on the web page and context as being key factors, but also acknowledges that layout and design may be a key factor comparing the simplicity of ads in simple ‘elegant’ web pages to those

that may be more cluttered. Similarly, Guildman (2021)* claimed that attention could be increased by careful curation of pages to maximise advertising within the context of a page. Green and Watson (2020)* suggested that ad environment and targeting was important, but also that ads themselves should use prominent branding, a strong visual hierarchy and a simple message to maximise attention. Dentsu Media (2021), based on their research into attention, have generated a predictive model of what will and will not get attention. This is based on factors such as ad / player size, domain or platform, device type, % of an ad in view, duration or ad length, ad volition (whether it was a voluntary or forced view) and sound. This attention model has been translated into an algorithm and a programmatic script that plugs into the media buying system to predict not only if ads will be seen but also if they will be given attention for the right amount of time. Stedman (2021)* has suggested that video content needed to be created for different platforms so as to maximise the attention it would get for that platform. Finally, Nelson-Field (2020) has suggested the top three aims of media's consideration of attention should be firstly to move from 'opportunity to see' to a 'verified human view' and understand attention in terms of incremental sales and to fuse attentional data with other data to provide deeper analytics.

All of these recommendations assume that high attention, mostly visual attention, is an asset that is both valuable and necessary in understanding and improving advertising effectiveness. However, there are others who have challenged this. There are also observations about the methods and technology that have been driving the debate on attention metrics, that need to be considered.

Critiques of these approaches

Despite the focus on high attention there have been others arguing that it may not be of high importance. Heath et al (2010) and Heath et al (2006) for example have a long-standing argument that emotional advertising works better at low attention. This assumption is that high numbers of eye-movements indicate high attention and processing. The argument hinges on the observation that cognitive adverts get higher numbers of eye movements than emotional ads. This research however may not adequately account for stimulus factors such as the nature of the difference between the emotional and control adverts they used, such as text and visual complexity i.e., larger amounts of text in a cognitive ad may lead to higher eye movement due to reading rather than any increase in actual mental processing. Similarly, Teixeira (2014) noted that ads may need to be made to work at low attention though his definition differs to that of Heath et al.

One significant consideration is that attention is often used as a global term for what is being paid attention to. However, the majority of the work this is based on is using head and eye-tracking. Specifically, eye-tracking to digital advertising which may be a specific exposure case that might not automatically be generalised to all media. Thus, the measures need to be identified by the authors far more in terms of visual attention rather than globally assuming all attention is visual. So, in other words, the metrics used and the implications that have been drawn have been based on what people

are looking at rather than any other type of attention. Although all advertising has a visual element, much has an auditory element as well, which is also an important source in determining where attention is paid. As will be considered later in the section on the academic view of attention, attention encompasses all of the senses and is not limited to vision alone.

Also, it should be noted the key measures of head and eye tracking as reported in terms of *dwell time* are only passive measures of attention. In other words, they do not indicate any active mental processing. In most papers, it is assumed that eye or head orientation does indicate active processing of what the viewer is orientated towards. It is entirely possible for heads and even eyes to be directed towards a media source with little or no processing of that resource occurring, this is particularly true of head tracking. Indications of eye movements (saccades) showing people are reading or that eyes are moving in order to comprehend and process an image would be a stronger indication of attention with active processing. This may be possible with some eye-tracking, but most papers only consider dwell time which is a passive rather than active measure of attention, though that there is likely to be a correlation between dwell time and processing. Edwards and Harrison (2021)* from Facebook (Meta) also make a valuable point that the dwell time as a primary attention measure can lead to bad practice when advertising on Facebook. They say the aim of view duration alone biases creativity towards cuddly animal content which, they consider, rarely drives business results.

One final and important issue is that the approaches to capture visual attention are not scalable. Permission needs to be sought to use front facing cameras and also, of course, to put cameras in people's rooms. As such any studies using this will always be limited to panels rather than be measures across campaigns 'in the wild'. Solutions such as Google's 'Device Signals' potentially offer a scalable solution.

Overall, there have been notable successes in the consideration of attention as a way to think about ad strategy. However, there are still questions over the holistic way in which attention is involved in our everyday lives. The next section will look at the academic literature on attention and discuss further how visual attention is only one aspect of attention and how this may pose questions for the visual attention-based models.

The academic view of attention

One of the key current considerations about all brain functions is how they are viewed through the lens of evolution. It is well established that our physical form is a result of many adaptations to our environment that gave us evolutionary advantages. We have forward-facing eyes like most hunters, opposing thumb and forefingers to hold and manipulate the world and are bipedal to be able to travel over lots of different terrain. What has come into focus more recently is that our minds are the result of a similar evolutionary process. Put simply, everything the brain does is to give us an evolutionary advantage. In reality, although we live in a very technologically advanced world, the 'mental tools' we have are still those that allowed us to be a more efficient hunter gatherers. It takes about 100,000 years of environmental change for us to see significant changes in response to our environment so essentially, we have pretty much the same 'mental hardware' as our ancestors who left Africa. Attention being such a mental function of course has to be considered in these terms. What our attentional system does, does so because it gave our ancestors an evolutionary advantage. So, in all cases, research into attention always has to be considered in these terms.

So how has attention been defined by those who study it in the academic world? The main definition is that it is considered as the selective focus of our mental and neural resources, it is what allows us to concentrate on specific things and alerts us to things we need to consider (Driver 2001).

One crucial point is that attention is commonly considered independent of our senses i.e., we do not have a dedicated system for visual attention and one for auditory attention. Our ability to pay attention is connected across all of our senses. This is why even hands-free phones have been shown to significantly impair people's ability to drive (Heenan et al 2014). Concentrating on something that we are hearing takes up enough attentional resource for drivers to miss seeing speed limit signs and potential hazards.

There have been various topics that have interested the academic study of attention, all of which relate to how our attention allows us to interact with the world. Firstly, one major consideration is how our attention is shared around our environment and the factors that cause us to pay attention, or not, to the things around us. A second consideration, which is related to this, is how much we process things that we do not pay attention to. A third topic has been how much we can share attention around different senses, most notably our auditory and visual senses at the same time, and finally what models best account for the data that has been gathered on what has been observed about attention.

How our attention moves around our environment

What is it that leads us to pay attention to some things and ignore others? There are two factors that are commonly considered as to the direction to ad focus of our attention at any point. These are called ‘Top-down’ and ‘Bottom-up’ factors.

Top-down attention is where attention is driven based on internal mental factors such as prior knowledge, wilful plans, and current goals in achieving a task. In contrast, Bottom-up attention is caused by externally driven factors that may be salient and noticeable because they stand out compared to their background (Katsuki and Costadinos 2014).

To explain this further, imagine you are walking to a meeting in an office in a new town you have never been to before. You get off the train and decide to use Google maps on your phone to navigate there. As you walk along you keep looking at the arrows on your device, then looking at the street signs and the road layouts, to match them up with the street plan on your phone. You also of course look out for other people on the street, so you don’t walk into them and listen out for cars as you cross the roads. This describes ‘Top Down’ attention. In this scenario to achieve what you want (getting to the meeting) you are controlling what you are paying attention to. Your internal mental processes are deliberately and consciously pushing your attention from all of your senses around your environment from phone to streets to other people, in order to achieve your goal.

In contrast, imagine during that journey to the meeting, just as you are about to cross a road you hear an emergency vehicle siren. You automatically ‘without thinking’ turn to look at it to see where it is and which direction its going in. This is ‘bottom up’ attention; something from your environment happens that is alerting you it needs paying attention to. This event can be auditory, like a siren, or visual, for example a flash of sunlight reflecting off a car, or even physical, like someone tapping you on the shoulder. But with ‘bottom up’ attention, it is an external event that impacts on you and without thinking your attention is automatically focussed towards it.

Our attention is commonly determined by a combination of these ‘Top-down’ and ‘Bottom-up’ processes, dependent on the task and environment we are in. Importantly it should be noted that attention is commonly considered as the method via which our focus switches around our environment. In the case of Top-down attention, such as a task like reading, this can indicate active processing, but attention is not always associated with active mental engagement. Attention can only be the first step in deciding whether things should be processed further rather than being a definite indication of actual processing.

How do we choose what we pay attention to?

An important area in the academic study of attention is the mechanism behind what we choose to pay attention to. This topic is called ‘Selective Attention’. In the early days of the study of attention it was personified by what was called the cocktail party effect. When we are in a group and there are a number of people talking, how do we focus in on one person and ‘tune out’ all the other voices? Note two things about this consideration; firstly, that experimentation on this topic was usually done using auditory stimulus as it was the easiest to do, but broadly the assumptions about attention were generalised to other senses and secondly it says much about the socialising habits of psychologists in the 60’s!

The key thing researchers have focussed on is how much of what we are not paying attention to gets processed, or in other words if we are listening to one person at a party, what other bits of the conversations are we actually understanding? In effect, what is happening to the stuff we ignore?

Over the years there has been much debate around the idea of what has been called early and late selection. This really means how much meaning does the brain extract of what we are ignoring. Early selection theories Broadbent (1991) have suggested that in fact very little actual meaning is pulled out and only rough surface features. For example, if that party you are at happens to be all female and you are talking to the only male, hearing his deeper voice in a sea of female voices is easy. So only things like the pitch and timbre of the other voices are processed, before the brain automatically ignores it before any meaning is extracted.

In contrast, other theorists have suggested ‘Late selection’. This means that meaning can be pulled out of what we are deliberately ignoring. Researchers such as Triesman (1960) suggested that in the party situation we are, to an extent, pulling in meaning from all conversations even when we are focussed on speaking to one person. In one famous study (Corteen and Dunn 1974), (which also says much about the early days of psychological investigation), two different passages of speech were played in opposing ears of respondents, (they listen to one sentence in the left ear while listening to a different one in the right ear). Their task was to copy (say out loud) the sentence in the right ear hence having their full attention on the content of that. Despite this, electric shocks were paired with certain words in sentences in the left ear (the one they were not repeating). Later when played these words amongst others, Galvanic Skin Responses showed people had paired the sensation of the electric shock with the words they should not have been paying attention to. Studies like this, it was argued, showed that people were aware of things they were meant to be ignoring, (and of course that psychologist in those days liked giving people electric shocks, thankfully the practice has long since passed).

Although much of this work was based on auditory stimuli, many other studies have shown that visual attention also follows the same ideas around early and late selection (Rock and Gutman 1981, Tipper, 1985), hence the idea of Selective Attention has been shown to generalise across all senses.

As with many psychological phenomena the early vs late selection models of attention have been the topic for debate over the years, to an extent the debate still continues. But more recently psychologists have been attempting to propose theories that explain how both views could be resolved. One popular theory that has been proposed is called Perceptual Load.

Perceptual Load Theory

Perceptual Load theory was originally proposed by Lavie (1995, 2000). She suggested that perceptual load, the amount of attention and hence the amount of mental effort you are asking the brain to do, has an effect on how much can be processed. If you are doing something that takes up a little attention (a low perceptual load), such as listening to music, there is plenty of attention left for you to do something such as write a report. However, if you are doing something that takes up a large amount of attention (high perceptual load), such as playing a game of speed chess, there may be little attention left for any other task.

So, for example, again imagine the cocktail party, it's a bit later and everyone is dancing. You are able to listen to the music which takes very little attention (and if you are blessed with the ability to dance), you move along in time with it while still being able to talk to someone at the same time. However, now imagine the person you are talking to is someone who is not from your native country and speaks your language with a very strong accent. Now you may find as you listen to try and make out what they are saying, you start to move out of time to the music and even maybe stop dancing to lean in and listen very carefully to be able to keep the conversation going. The more you have to focus your attention, the less you are able to 'multitask'.

In some lab experiments it has even been possible to show some extreme cases, where giving people a complex task in one sense entirely inhibits their ability to do something in another sense. Molloy et al (2018) gave people very demanding visual tasks which lead them to be unable to hear certain auditory changes. This 'attentional blindness' shows that if we try to do too much on one task, with one sense, the other tasks with difference senses that require attention get less. Hence why mobile phones and driving are a poor mix.

Another famous example of our limited attentional capacity is the inattentional blindness experiments conducted by Chabris and Simmons (2011). Famously these 'invisible gorilla' experiments involve showing a film with two teams, one in white the other in black. Respondents are asked to watch how many times the ball is passed between the white team, and in doing so completely fail to notice the dancing gorilla enter and leave the scene.

The Perceptual Load theory fits very well with the evolutionary view of attention, as it makes sense that we would evolve the ability to direct our attention toward a certain task, while at the same time leaving some capacity to keep us informed about other things that may be going on around us.

Another key point is the differences between our visual and auditory attention. Molloy et al (2018) pointed out that one key difference between visual and auditory attention is that we are actually unable to switch off our auditory perception. No matter what we are doing our auditory system is 'on' permanently, when we are engaged in other tasks and even when we are asleep. So we can be visually engaged in a task while at the same time our auditory attentional system is 'open' to alert us to anything in our environment that we need to pay attention to. She hypothesised that this was likely as our auditory attention system evolved as an 'early warning system' to alert us, even if our visual attention was on a particular task. Though this is noted with the caveat that it is possible to overload attention with visual stimulus that may lead to auditory attentional 'deafness' but this is usually an extreme condition. However, this multiple use of our attentional resource may come at a cost.

One area of study related to media consumption looking at our limited attentional capacity has been multitasking. This is where we are trying to do two or more tasks at once. Miller (2017) argues that in fact we have a very limited bandwidth through which we see the world, as he says, *'we are sipping at the world through a straw'*. He has provided evidence suggesting that when we are multitasking, we are not actually multitasking at all. He stated that we are in fact switching our attention rapidly from one task to another. Moreover, every time we switch our attention there is a cognitive cost, in that we slow down and make more mistakes. Though, he acknowledges that our brains evolved to seek out novelty as that was usually important so multiple sources in our environment can be hard to ignore.

It does make sense that we are able to divide some of our attention between sources even if we are switching it rapidly, but it seems we are more capable of doing so when it is in different senses. We are unable to listen to what two people are saying when they are speaking at the same time, but we can listen to music and drive. The implications of attention and multitasking are of course relevant to how we understand how people process advertising, as adverts virtually never appear in complete isolation to other things that can attract our attention.

Summary

This of course is a very brief summary of some of the issues in attention from the world of academia but hopefully covers some of the key topics and findings about attention. From reading this you may well already note that there are some key places where the current view on attention is not aligned with what we know from the academic world. The next section will compare and contrast these two literatures and discuss what we know and what there is still to be understood.

Comparing academic evidence and media practice

In 2012 Thinkbox did a piece of research called ‘Screenlife’ looking at multiscreening (Goode 2012)*. The focus was on the use of second screens in the front room, however one of the key observations was that front rooms are busy and complex environments. Because of this it could be seen that attention is constantly shifting around multiple sources constantly. One primary example was a young man who was dividing his attention across four sources. On his phone he was laying bets, on his laptop he was booking a stag do, all while having a conversation with his girlfriend about going to visit her parents that weekend. All of this time the TV was also on, with the sound up. At one point he looked up for 1½ seconds at a stuffed crust pizza advert. When interviewed a few days later he reported buying one later that week (note this was his only viewing of that ad that week). This is just one case, but this kind of observed behaviour is an example of the kinds of multimedia environments people are increasingly interacting with.

This observation throws up key questions. Firstly, how attention is being pushed and pulled around all of these multiple, visual and auditory, attention demanding sources. By definition it will be a combination of ‘top down’, being directed in line with the goals the person is trying to achieve, and ‘bottom up’ what they are hearing and seeing, maybe in their peripheral vision. Of course, the key question is what factors are involved in advertising getting and maintaining attention? Secondly and importantly, when an ad is encountered in this complex attention demanding situation, what exactly is being processed and retained in memory that will influence purchase behaviour? Will it be only the high / full attention encounters that will be influential or will there be other ‘lower’ attention processes impacting on generating Mental Availability for brands.

To try and think about how to approach answering this complex question, indicating the next steps for attention in advertising research, this section will look at where the academic and business literatures coincide and where they differ, revealing what we do not know and what we need to find out about attention.

Key areas where academic and business thinking align

The focus on measures of visual attention do coincide with the broad view from the academic understanding of visual attention. We know that there are a number of things that draw visual attention. Primarily areas of high contrast, dark on light and vice versa. Similarly, anything that is isolated against a simple background will draw visual attention whereas something on a complex background will not. So broadly speaking anything that stands out from its background (Hutton et al 2009). This aligns with Follet (2021)* comparing simple and complex web pages. We also know that text also draw attention especially larger text. Again, this matched what Green and Watson (2020)* conclude about size and text and ad layout.

It is also worth noting from the academic literature that other stimuli such as faces, especially those expressing emotion, movement of objects - particularly looming (something getting bigger as it gets closer), especially in our peripheral vision attract attention. Gaze cues, looking where others look can also affect where our attention goes. All of these are hangovers from the days our ancestors had predators. No literature was found on this for advertising specifically, but it would be expected that this would be consistent with advertising if tested with these features.

For auditory attention the rules are similar. Difference to background based on pitch and timbre, as well as potentially spatial direction have been found to draw attention, and of course increased volume above background noise (Kaya and Elhalali 2014). Again, it is noted that this aligns with most advertising ideas that increased volume also increase attention. The rules of human evolution also hold for auditory attention, as our ears are designed to hear other human voices, so any isolated speech, (what you overhear on the bus or train), or particularly a voice expressing emotion such as a laughing or a crying will be attention grabbing.

Key areas where academic and business thinking do not align and what questions this prompts

The biggest current discrepancy between advertising attention literature and what we know from academic study is the focus on visual attention for ads to the exclusion of any sufficient understanding of the role of auditory attention in directing, maintaining, adding to a narrative and its role in persuasion. This has come about as measures used for advertising do commonly only measure visual attention. This is an important point as to the role of auditory and visual processes has been highlighted as being different in academic work.

As discussed above, Molloy et al (2018) pointed out the persistent nature of our auditory systems and how we are unable to switch it off, even when we are asleep. This ability evolved so that our ears acted as an early warning system to indicate to us what we should be paying attention to in our environment. This matched with what was observed in the Thinkbox Screenlife study, with someone readily able to selectively attend to what his girlfriend was saying (tuning out the sound from the TV) while visually consuming media from the TV and two other screens.

The importance of auditory attention in media consumption was commented on by Dann (2014) who noted that studies showed people were far more likely to turn off a television programme if the sound rather than the picture quality was reduced. This is no doubt why questions have even been raised in the House of Lords over ‘mumbling’ in dramas such as Jamaica Inn and SS-GB on the BBC.

Interestingly, the idea that auditory attention to an extent is always on align with the findings of a survey-based study from the Radiocentre (2020)*, who found that radio was claimed to be the least avoided ad media (along with cinema but with cinema, avoidance is considerably harder!). Kesten (2021) also argued that Spotify could

increase attention by personalising messages. Hence if the auditory attention is always on, any expectation to hear ad messages would be enhanced if the messages were personally relevant.

So, although the measures of head tracking and eye tracking are indicators of visual attention, they, by definition, do not account for the all the influences of auditory attention from ads that include an auditory element, such as TV, YouTube and of course radio. It is clear we navigate our way through the complex media and day to day lives through both auditory and visual attention cues.

Do we need to think about extending our assumptions about attention?

Comparing the academic and business literature it is clear there are places where some ideas overlap. However, it is also clear, there are gaps in our knowledge, particularly when it comes to considering the auditory elements of attention. There also seems to be ample opportunity to apply academic learnings to advance how we consider advertising attention.

Applying Perceptual Load Theory

Whereas important advances in the measurement of attention have taken place, it is clear that visual gaze to indicate attention, that has been driven by the advances in technology, is only part of the story. Attention is far more than gaze direction alone so this prompts one key question:

1. How much 'Perceptual Load' is indicated by measures of visual gaze direction?

It is noted that the answer is likely to be complex as it is possible for gaze to be directed with and without attention but the overlap between gaze direction towards adverts and attention to adverts should be established.

A second point corresponding to Perceptual Load relates to the level of attention that is needed for a unique brand asset to be lodged in a consumer's memory to create Mental Availability. As has been seen from studies such as Thinkbox's Screenlife and Google's Attention Counts, front rooms are complex places with multiple attention sources that all forms of advertising have to compete with. So, another question to consider:

2. How much attention is required for an ad to communicate Unique Brand Assets and create Mental Availability?

Again, the answer may be complex as considerations such as what conditions constitute low or divided attention would need to be defined. On top of this consideration of the Perceptual Load is taken up by secondary tasks people undertake in their front rooms i.e., eating / household chores, looking at or reading mobile devices. It would be helpful to understand which activities take up little perceptual load and hence allow for ads to be comprehended at the same time. So, we do need to ask:

3. Should low attention processing be reconsidered for adverts as a way to understand effectiveness?

Famously Saatchi & Saatchi (1981)* (repeated by MS+M (1996)*) invited consumers to test a new kind of starch, and while they ironed, the radio was left on. This 'Ironing

board study' found 80% prompted recognition for ads even though the primary attention was on ironing. Similarly, Goode (2012)* found no difference in prompted ad recognition between people who watched a single screen compared to those who were multiscreening while being exposed to ads. Clearly ads work best at high attention, but lower / partial attention may not be a lost exposure. Low attention to TV ads may still be effective and 'Gist' perception for static ads may also be enough for some Mental Availability for a brand, to be created. There has been considerable focus on exposure to advertising at high attention, leading to active ad consideration and conscious decision-making processes. In fact, the current literature implies this is the only goal to successful advertising. However, although high attention is clearly desirable, the psychological literature outlines many forms of incidental and associative learning that occur in the absence of any high attention. Hence a re-examining of Heath's (2014) ideas, if not methods, would seem a worthwhile exercise, and be likely to yield an advance in the understanding of ad effectiveness.

Another related question to low attention ad exposure is whether people can truly multitask or whether, as the academic literature assumes at the moment, people attention switch. So, we do need to ask:

4. Can we multitask or do we switch attention to and from ads when engaged in another task, and if so, what deficit exists each time we switch?

This could be an ongoing consideration as Loh and Kanai (2014) found that people who reported being avid multiscreeners, scored poorly on cognitive control tasks (being able to concentrate and not be distracted). Moreover, using MRI, they found deficits in brain areas associated with cognitive control. Although this was an association, one intriguing possibility, is that people who are engaged in high levels of multi-screening (attentional switching across different media sources) may be undergoing neuroplasticity, whereby their brains are changing their physical structure in response. The net result is that people who have grown up multiscreening, may be less able to pay attention to a single source and are more easily distracted. If this is the case, it has raised potential questions about how we consider ad effectiveness as native multiscreeners may potentially be mentally 'rewired' to be less able to pay full attention for an amount of time. If true, this would have an impact on both media buying and creative input into ads.

Considering Selective attention

One key observation when people are in multi-attentional demanding environments is their ability to 'tune out' some attention sources and focus on single sources. This too prompts questions.

5. What makes us selectively attend to adverts?

Are there certain cues that draw our attention to adverts, if so, are these loud noises or just interesting sounds? Also, are there certain phrases that grab our attention?

These might be phrases related to specific heuristics commonly used in ads such as Herding - ‘a favourite / the most popular’ or Loss aversion - ‘Sale ending soon / don’t miss out’, that we are conditioned to listen out for as a ‘cue’ to pay attention to ads.

Also related to this is the potential different role of auditory and visual elements of brands. Do they act differently in the activation of Mental Availability? For example, do linguistic elements of ads more readily come to mind at the point of economic decision making if they are experienced auditorily or if they are read? Or to put it more generally:

6. If we are visually engaged in one task (e.g., looking at an ad and can hear another advert) which one will be the more likely to create Mental Availability?

In addition, how do sonic and visual cues in an ad work together?

7. How much do sonic and visual cues add to each other – is seeing the steak enough or do you have to hear the sizzle as well?

The academic literature on attention has also been considered mostly in terms of perceptual capacity, how much information is the mind capable of processing at one time. Importantly, this does not necessarily correspond to retention in memory hence we also need to ask:

8. What happens beyond attention, and what is the relationship between attention and retention of brand assets from ads and how are they retrieved via Mental Availability to impact purchase choice?

Finally, an observation outside of the academic literature is that much of the advertising attention theory has been derived from digital advertising. So:

9. Can we apply the same attention rules to all media, or do we need to think differently about attention dependent on the media we are considering?

Conclusions

The intention of this paper has been to review current ideas on attention and advertising. The aim has been to consider where current thinking is at the moment and compare this to the academic view on attention. The objective was to highlight where current practices are succeeding but also what questions still remain to be answered and provide some potential direction as to how to move the debate about attention forward. What is clear is that there is still some way to go to fully understand the role of attention in advertising and best understand how attention can be used to enhance ad effectiveness even more than it has done so already.

And… as is customary in such papers the final thing to say is thank you for your attention.

Dr Ali Goode, Cognitive Scientist, Gorilla in the room

Dr Ali Goode started his career as an academic Cognitive Scientist working in memory, attention and consciousness, and completed a PhD in advertising and implicit memory. He began working in media research 20 years ago, applying cognitive science to ad effectiveness across different media, and is currently pioneering the understanding of ad and brand effectiveness in the metaverse. He has been a judge for the IPA Effectiveness Awards and is the only person to win the MRS Advertising and Media Award three times.

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