Private and Public: Eye Movement and Eye Tracking in Marketing

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1 Growth in Eye Movement and Eye Tracking Research

There has been an exponential growth in eye research and concomitant use of eye-tracking methodologies in the last decade. Improvements in eye-tracking technologies, enhancements in the sophistication of eye-tracking data analysis software and the development of smaller, more portable and mobile eye trackers has immeasurably increased the range and volume of applications. Komorgortsev (2011), using Google Scholar, has demonstrated that eye-tracking-based research publications had reached over 2000 articles and papers in 2011.

2 Eye Tracking in Marketing Research

This exponential increase in applications of eye-tracking research methodologies and applications is understated in marketing and marketing-related disciplines. This is because as well as eye-tracking research and applications being undertaken and disseminated by the university and academic sector—a whole eye-tracking marketing industry has arisen in the private sector. This private sector industry is both large and expanding, with hundreds of companies internationally conducting eye-tracking research and consulting for private and public sector clients.

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A core development in this space has been the rise of what Duchowski (2007) has termed ‘applied research organisations’. In many cases, such applied research organisations are wholly or partially owned by eye-tracking firms. Such organisations provide full service delivery for eye-tracking businesses: training and development, marketing research, consulting and the development of specialised software to solve industry problems.

These applied research organisations can also be eye-tracking technology service providers and also private marketing business specialising in neuroscience solutions for marketing problems. In addition, some large national and multinational firms have developed eye-tracking marketing research capabilities within their own marketing departments.

The reasons for these developments in eye-tracking marketing research were first outlined by Duchowski (2007), who noted that ‘the motivation for utilising in market research stems from the desire to understand consumer actions. …eye tracking can provide insight into at least one aspect of the internal consumer model: how the consumer disperses visual attention over different forms of advertising’ (Duchowski 2007, p. 262). Eye-tracking research can also be used to analyse and develop the consumer attention process and modify presentations and display to increase the capture of this attention. One part of marketing research using eye tracking is to develop usability research—to iteratively design more attention developing visual display through systematic collection of user response data.

3 The Rise of Applied Eye-Tracking Research Organisations

The importance of marketing in modern business and the significant and considerable investment in marketing and the evaluation of the costs and benefits of this investment have directly led to the rise of applied eye-tracking research organisations. These organisations and cognate private marketing businesses, however, rarely share their research. Usually the research is proprietary and confidential. Dissemination of results and methodologies is usually contractually restricted, commercial in confidence or has involved substantial intellectual property development—protected through contractual negotiations. As a result, much the actual marketing research work is not reported or released. Accordingly, there is a significant gap in understanding of the entire corpus of eye-tracking marketing research due to its proprietary nature and the restrictions around its dissemination and publication.

As well as providing an academic case study based on eye movement research, the chapter also provides a case study from a private sector organisation. This chapter presents a case study from an applied eye-tracking research organisation, which seeks to reflect the large volume of such eye-tracking marketing research and represent the eye-tracking marketing research activities conducted by such applied market research organisations. Central to the case study are the needs of the clients and the directed nature of the research to solve business problems in marketing.

4 Case Study 1: A Case Study from the Financial Services Industry on the Facilitation of Customer Design

4.1 Background to case study

Customer experience is a buzz word in the retail arena. The last decade has seen a tremendous change in the way customers interact with services. Ubiquitous technology has empowered the customer to stay connected and informed. This increased power and awareness has resulted in higher customer expectations of the retail experiences they are delivered. Businesses are, therefore, looking at user research for understanding their customers and the context of use of their services and, thus, design services that provide the enhanced experience the customer is expecting. Eye tracking is fast catching up as a preferred user research technique. Businesses are leveraging on eye tracking to understand the outreach of their marketing collaterals, the physical evidences in their retail outlets, the effectiveness of their service encounters, etc.

The Service Innovation practice of a bank has been propagating the value of service design and the need to design for customer experience. In this context, the bank partnered with Objective Eye Tracking Pte Ltd, an eye-tracking consulting company in conducting customer experience research for a major Financial Services Institution that offers retail banking services. The retail banking service provider was interested in understanding their customer, their context of use of the bank branch services and the performance of their products and merchandise in attracting the attention of customers and embedding their brand and products in their minds.

4.1.1 Eye Tracking

Tobii eye-tracking glasses were used in the research to record audio, video and eye gaze position of the person wearing the glasses. In the Tobii eye trackers, the image sensors collect visual information of the person and the reflection patterns generated on the cornea using the near-infrared diodes. Applying sophisticated image analysis and mathematics on this information, the exact gaze point is calculated every 30th of a second, thus revealing what the person is looking at.

The eye-tracking glasses provide data in the form of the audio/conversations, video/scene within the field of vision of the user and the gaze point. In addition to this information, it is necessary to capture the intention behind the attention given to an item of interest. This is done through a retrospective think-aloud interview session, where the user watches a playback of the video recorded and voices their intentions as they come across various points of interest. Using this technique, we review both their conscious and unconscious experiences to decode exactly why they behave in a particular way.

4.2 The Research

The bank has several branches situated island-wide typically serving customers who work/live in the neighbourhood. The bank branches, like any retail outlet, use their physical venue to display marketing merchandise that promotes the service products offered by the bank. The bank has modelled some of the branches to cater to certain demography of customers that it serves, thus displaying marketing merchandise relevant to that demography.

The objective of this research was to provide an understanding of how all the merchandising is working (or not working) within the branch. The bank had also identified some merchandise as their 'areas of interest', which need to be specifically analysed in this research. From this understanding, the bank planned to design its campaigns and services to benefit the customers, marketing teams and branch managers.

Based on the 'areas of interest' identified and the objective of the research, the metrics that need to be derived were identified. Participant percentage, fixation count and fixation length were some of the key metrics that were identified to provide insights into the 'area of interest' that captures and retains the attention of the bank's customers.

The research was conducted in four bank branches, two typical, one themed on a specific product and one remodelled with mobile gadgets to cater to digital natives and digital immigrants. The data collection was done over 2 weeks at these branches. The walk-in customers to the bank were intercepted and enrolled for the research. The enrolment included set-up with the Tobii eye-tracking glasses by fastening the glasses at the back of the head with a head strap and calibrating the glasses. Once enrolled, the participants proceeded to perform their transaction at the teller. The participants had to wait in queues before their turn to be served which allowed for rich data capture. While the participants are wearing the glasses and transacting, they are also passively observed for any specific action or intervention. On completing their transaction, the glasses were recovered from the participants and the recording was played back to them for their retrospective think-aloud interview. The participants were questioned on their thought process at various points in the video and these data were also recorded. The participants were compensated for their time with an incentive.

The video recording, the gaze-point information, the audio, the recording of the retrospective think aloud and notes made by the observer form the volume of data that were later analysed. The qualitative data collected were manually coded against the preset 'areas of interest' and statistical data were derived. On the other hand, the researchers also used affinity diagramming to synthesize and derive insights from the qualitative data gathered. The results from these derived data were put together and presented to the bank as a baseline for the performance of their various merchandise.

The results were presented to the bank in two stages. The first-stage presentation was in the form a workshop, with a purpose of providing the wider team with an overview of the methodology and headline findings. In the workshop, the audience was grouped into teams and provided with some of the issues uncovered in the

research and guided through analysis and brainstorming sessions to identify possible solutions. The second and final presentation was given in the form of a detailed report which presented statistically significant evidences that confirm/refute hunches, convert early hypotheses to tenable theories and present new findings that establish a baseline for the marketing merchandise in the context of retail branch banking.

In this study, visual media (TV) emerged a clear leader as opposed to print media (brochures, posters, etc.) in capturing and retaining attention, with 85% attention and 81.5 s dwell time, as opposed to their immediate competitor, menu boards having 75% attention and 15.7 s dwell time.

This eye-tracking research has provided the bank with findings and evidences that are beneficial in establishing a baseline for their merchandise and strategizing their campaigns and services to better serve their purpose.

4.3 Customer Experience and Eye Tracking

It is seen that people choose products and services based on their experiences with them. Such experiences are formed over many touch points or interactions the customers have with an agent or artefact of the service or product. The experience the customers take away is unique and depends on them and their context. Thus, it is essential to understand the profile of the users, their expectations and the various contexts of use of the service/product. Eye tracking works as a favourable data collection mechanism to provide insights into the use of the services or products.

5 Case Study 2: A Case Study Exploring the Influence of Articulatory Suppression on the Reading Direction Effect

5.1 Background to Case Study

This case study presents a research project that examined the influence of articulatory suppression on an eye movement driven phenomenon, the "reading direction effect" (Li and Briley, 2011). This project is broadly representative of published eye movement marketing research emanating from university/academic marketing departments.

The past decade has seen noticeable research advances on eye tracking and eye movement processes in the academic marketing area. For example, Pieters and Wedel (2007) utilised an eye-tracking experiment to investigate the influences of consumer goals on their visual attention in viewing advertisements. They found that when a consumer aimed to memorize an advertisement, both its verbal and pictorial information was attended to a higher level; whereas when the consumer's goal was to learn the brand, only verbal component in the advertisement received

increased attention (Pieters and Wedel, 2007). In another series of eye-tracking studies, Brasel and Gips (2008) examined the potential threat toward advertising effectiveness posed by consumer fast-forwarding behaviour (e.g., consumers utilising video recorders to fast-forward through the advertisement breaks) and they found that fast-forwarding viewers tended to constrain their attention primarily to the central screen position. Hence, they argue that marketers can alleviate the negative impacts of video recorders by placing brand information centrally in advertisements (Brasel and Gips, 2008). Atalay, Bodur, and Rasolofoarison (2012) also conducted eye-tracking studies to further explore the centrality bias where they demonstrated brands presented at horizontal centres were able to gather more attention and selected more frequently by consumers.

Despite the fruitful findings, the academic marketing research has so far mainly focused on gauging consumer visual attention under ideal laboratory environments. Little effort has been made to address the potential interference effects on eye movements or eye tracking by secondary tasks consumers engage in on daily basis. For instance, can consumers' eye movement processes be shaped by their concurrent oral muscle movements, including consumer daily activities such as eating or speaking? This case study aims to provide a preliminary answer to this question. Specifically, it looks into how eating activities can interfere with the eye movement processes underlie the reading direction effect, where consumers' attitudes toward a moving brand increase when the brand movement direction is consistent with their habitual reading direction (Li and Briley, 2011).

5.2 Previous Research on the Reading Direction Effect

Li and Briley (2011) proposed that two modes of eye movement could lead to the reading direction effect: a habitual and a situational mode. First, as the dominant eye movements in processing alphanumeric stimuli (e. g. brand names) are made in the habitual reading direction (Rayner 1998), eye movements in this habitual direction could act more fluently than in other directions. Secondly, when an alphanumeric stimulus moves horizontally across a consumer's field of vision, it tends to activate situational eye movements of identical direction (Palmer 1999). If the direction of activated eye movements coincides (vs. conflicts) with the consumer's habitual reading direction, s/he might experience heightened motor fluency. This process might lead to increased evaluations of the stimulus (i.e., the reading direction effect) when the consumer attributes the fluency experience to the quality of the stimulus itself (Bornstein and D'Agostino 1994).

Li and Briley (2011) presented compelling evidence for the reading direction effect. They demonstrated that this directional bias existed on both pure (i.e., moving brand name) and mixed alphanumeric stimulus (i.e., moving brand logo; Li and Briley, 2011). Furthmore, this effect should be driven by motor fluency in eye movements and procedural knowledge activated in reading (Li and Briley, 2011).

5.3 Current Research Project

Extent research suggests that motor fluency effects should be characterised by their effector dependency (e.g., Topolinski and Strack 2009). That is, such effects can only be blocked by engaging fluency-associated muscles. If that is the case, and if the reading direction effect is really driven by motor fluency, then a concurrent unrelated motor task, say, a manual motor task, should not cause any interference on the effect. Furthermore, as being exposed to words (e. g. moving brand name) automatically triggers reading activities (Stroop 1935), and the central effectors in reading are the oral muscles (McGuigan et al. 1964), the reading direction effect should be blocked by an articulatory suppression manipulation (Emerson and Miyake 2003), e. g. oral muscle movements such as gum chewing activities (Campbell et al. 1991).

The current research project examined conditions under which the reading direction effect was susceptible to a concurrent motor task. In this study, participants (all left-to-right readers) were assigned to one of four conditions, based on a two (brand logo movement: left-to-right vs. right-to-left) by two (concurrent motor task: manual vs. oral) between-participants design. Specifically, participants in the concurrent manual task condition were asked to watch and evaluate a moving brand logo while kneading a rubber ball, whereas participants in the concurrent oral task condition chewed a piece of gum while evaluating the moving brand. The results demonstrated a replicated reading direction effect under the concurrent manual task. That is, participants who kneaded the rubber ball indicated higher likings toward the moving brand when it moved from left-to-right rather than from right-to-left. However, this effect went away among participants engaging in gum chewing while evaluating the moving brand. Furthermore, no difference was found on the amount of attention paid to the brand evaluation task between participants in the concurrent manual and oral tasks, ruling out the alternative explanation of attention depletion. These results show that the reading direction effect is indeed effector dependent, adding evidence that motor fluency and procedural knowledge activated in reading are the underlying mechanisms behind this effect.

5.4 Implications for Eye Movement and Eye Tracking Research

The findings of the current research project also shed light on general practice and future directions in eye movement and eye tracking research. On the one hand, as visually presented language stimuli can only access phonological working memory through subvocalization (e.g., Eiter and Inhoff, 2010), any oral muscle movements that might block subvocalization could interfere with the language stimuli being processed and utilised. Therefore, oral activities that might cause articulatory suppression (e.g., eating or speaking) could bias eye movement effects or give rise to less than accurate eye tracking results. Future researchers should heed these potential biases especially when they run eye tracking studies in unobtrusive, natural

settings which could cause a lack of control on participants' oral muscle movements. Moreover, literature also suggests that the powerfulness of acticulatory suppression varies depending on the type of language being read (Besner, 1987). Hence, eye movement and eye tracking researchers should pay particular attention on the validity of data collected cross-linguistically, or cross-culturally. Lastly, researchers should also explore bodily processes other than oral muscle movements and rule out any other potential interference factors in eye movement or eye tracking research.

6 Conclusion

This chapter has provided contrasting case studies that illustrate the types of research being conducted in the private sector and academic sectors. Although superficially similar—especially in regard to the use of similar research methodologies—the research illustrates the breadth of eye movement and eye research applications in marketing. The industry problem and focus determines the research methodologies and iterative nature of the first case study located in the private sector consulting and research industry. The hypotheses at the core of the second case study reflect an academic focus in seeking to support research problems expressed in academic discourse. The published eye movement and eye-tracking research applied to marketing seriously underrepresents the volume and range of eye-tracking-based marketing research conducted by the private sector.

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