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Investigation of Embedded Brand Placement Within Esports

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Abstract

The video game and esports industry has grown exponentially over the past few years. “During recent years, esports have become one of the most rapidly growing forms of new media driven by the growing provenance of online games and online broadcasting technologies” (Hamari and Sjöblom, 2017). Sponsors have identified marketing opportunities in this rapidly growing advertising medium. Brand placement in esports is gaining momentum as a means to target audiences in an indirect and engaging way. In our study we have defined embedded brand placement in the context of video games and esports as the practice of including a brand name, signage or other forms of trademark merchandise integrated naturally within the game and in return, visibly featured in the esports broadcast. The aim of this study was to examine how embedded brand placement performed during different spectating scenarios which possess different distraction levels and in-game dynamics (audio and visual). Our study explores the effectiveness of embedded brand placement within esports by employing an eye tracking methodology as well as a brand recall exercise in connection to participant's prior involvement with the video game, League of Legends and the respective esports scene. The practical implications from the results of this study hope to assist advertisers in making a better informed decision about collaborating with esports events and uncover a better perception in regards to how they might expect their advertising messages to perform. Through our study, we have successfully contributed to the foundation of research surrounding embedded brand placements within esports through our investigation of practical factors affecting to which extent viewers are able to consume these advertising messages. These factors being prior involvement, how differing spectating scenarios, distractions and in-game dynamics affect fixations on advertising messages and finally how the above factors contribute to overall brand recall as well as long-term versus short-term brand recollection.

Keywords: esports, league of legends, embedded brand placement, eye tracking, brand recall, prior involvement

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1 Introduction

The video game industry has grown exponentially over the past few years. “Some games have evolved into mega sports events, similar to the Olympics or the World Cup” (Young-nam Seo et al. 2018). The 2020 World Championship of a highly popular Multiplayer Online Battle Arena game, League of Legends hosted 24 teams from all around the globe that competed for a total prize pool of 6,450,000 US Dollars. The 2020 World Championship or Worlds 2020 as it is commonly referred to, garnered over one billion hours of viewership time while also achieving 45.95 million peak concurrent spectators and is currently the most viewed League of Legends event in history (LoL Esports, 2020).

League of Legends is a global top sport that attracts the attention of millions of fans all over the world. At present, there are more than 800 professionals playing in over 100 professional League of Legends esports teams competing in twelve leagues around the world. Every regional league comprises about ten teams that face each other over the course of the entire year divided into two seasons. The teams collect championship points in order to qualify for the two major international competitions: the Mid-Season Invitational and the League of Legend World Championship or Worlds (LoL Esports, 2020).

Hamari and Sjöblom (2017) define esports (electronic sports) as “a form of sports where the primary aspects of the sport are facilitated by electronic systems; the input of players and teams as well as the output of the esports system are mediated by human-computer interfaces”. Simply, esports refers to professional video gaming that is typically broadcasted with live commentary on TV or Internet platforms.

With the incredible growth that the esports scene has witnessed during the past few years, sponsors have identified marketing opportunities in this rapidly growing advertising medium. Brand placement in esports is gaining momentum as a means to target audiences in an indirect and engaging way (Martí-Parreño et al. 2017).

Our study explores the effectiveness of embedded brand placement within esports through an eye tracking and brand recall exercise. Panda (2004) defines brand placement as “the practice of including a brand name, product, package, signage or other trademark merchandise within a motion picture, television or other media vehicle for increasing the memorability of the brand and for instant recognition at the point of purchase”. “By placing brands and products in video games, marketers expect to influence cognitive, affective and conative consumer outcomes including brand salience, brand recall, brand recognition, brand attitude, brand choice or purchase intention” (Balasubramanian, Karrh, and Patwardhan 2006).

In our study we have defined embedded brand placement in the context of video games and esports as the practice of including a brand name, signage or other forms of trademark merchandise integrated naturally within the game and in return, visibly featured in the esports broadcast. Embedded brand placement is the inclusion of a product or brand within a digital game and can be integrated into the gameplay either in a subtle or a prominent manner. In the context of League of Legends, embedded brand placement is present in the form of static banners. The official name of these digital products are “Arena Banners”, and it enables regional leagues as well as global events to customize how the game appears to viewers during official matches (LoL Esports, 2020).



Figure 1. An example of an “Arena Banner” in League of Legends.

The problem with using an advertising format such as these “Arena Banners” is whether they are truly effective when embedded beneath highly visual and audio intensive moments of broadcasted gameplay and if spectators are able to consume messages efficiently while distracted. It is already known by other researchers that as distraction levels increase, recall and comprehension decline (Thomas et al. 2011).

The aim of this study was to examine how embedded brand placement performed during different spectating scenarios which possess different distraction levels (audio and visual). This was in conjunction with assessing data gathered from the test subjects such as prior involvement and interest in esports along with ability to recall brands during high and low distractions presented to correlate the effectiveness of this embedded brand placement system.

It is crucial to articulate that our study only observes a small sample size of participants which is not indicative of the entire spectating population. However, the motivation for this subject topic was to start a novel conversation about how effective this type of brand placement is and to create a foundation for further future research.

We first discuss the problem in further detail, define our research questions and hypothesis, then assess the elements of our scope and limitations of the study itself. Additionally, the method of obtaining data to analyze will be outlined along with the theoretical framework the study is built upon.

1.1 Problem statement

Brand placement within sporting events isn’t a novel concept. Through sport sponsorship, companies can display their sponsorship messages to a large international audience and enter large samples of sponsors’ target markets (Maricic, Milica et al. 2019).

“During recent years, esports have become one of the most rapidly growing forms of new media driven by the growing provenance of online games and online broadcasting technologies” (Hamari and Sjöblom, 2017). With the incredible growth that the esports scene has witnessed during the past few years, sponsors have identified marketing opportunities in this rapidly growing advertising medium. Brand placement in esports is gaining momentum as a means to target audiences in an indirect and engaging way (Martí-Parreño et al. 2017).

Presently we witness a plethora of brands integrating themselves into esports events and organizations and we hypothesize that these partnerships are only going to increase in the future. For example, the BMW Group recently struck a partnership with the five best League of Legends teams in the world, all under one motto, “United in Rivalry”. “The BMW brand is currently engaged in a major expansion of its involvement in the world of computer, online and simulation games (esports), a field

that's been continuously growing in popularity, especially among the next-generation target group." (BMW Group, 2020). Correspondingly, the Stuttgart-based luxury brand, Mercedes-Benz has become the exclusive automotive partner of all global League of Legends esports events. Stating in their press release that "League of Legends is one of the most popular games in recent years. By partnering with League of Legends at the global level, we want to participate even more actively than before in shaping the future of esports and inspire fans about our brand in a playful dialogue." (Mercedes-Benz, 2020). Similarly, Nike have also stepped in the esports scene by sponsoring one of the major League of Legends leagues, the LPL. "Nike has announced its partnership with the League of Legends Pro League (LPL), becoming the official shoe and clothing provider of the top online gaming league in China" (Nike, 2019).

As BMW states, esports is a successful medium to advertise to the "next-generation target group" (BMW Group, 2020). Thus, the research into advertising within esports is highly relevant information for advertisers looking to invest in the future market of consumers. Not only will the next generation of consumers replace the aging population of customers, but there is evidence that those interested in the topic of esports have decent spending power. A report from Nielsen (2015) established that the average age of esports fans living in the U.S. is "32 years old and their mean total household income reached around 64,900 USD". Additionally, a report from Mindshare North America (2016) similarly indicated that "43% of total esports fans earned more than 75,000 USD and 31% of them had an annual household income of 90,000 USD or higher". Thus, the esports viewer base is potentially lucrative and poses a great marketing opportunity.

A study by Young-nam Seo et al. (2018) examined the effects of ad animation and in-game dynamics on viewers' visual attention during esports broadcasts and adapted an eye tracking methodology that evaluated brand placement occurring in the broadcast layer. The results from this experiment showed that "both ad animation and in-game dynamics had significant effects on viewers' attention in terms of fixation count and fixation duration measured by an eye tracking device". Specifically they uncovered that participants stared at virtual adverts more frequently and for longer when such adverts were displayed during "non-battle scenes". The conclusion from Young-nam Seo et al. (2018) later advised marketers to embed advertisements "more strategically by avoiding intensive and possibly immersive game contexts as much as possible.". The outcome of this paper outlined results that we aimed to achieve within our own work, this time looking into embedded brand placement rather than advert animation and virtual ads surrounding the broadcast layer.

In our research, we also utilized an eye tracking exercise to define gaze point patterns within different spectating scenarios to accurately link fixation counts (how many times a participant looks at areas of interest) and by tallying these counts, find the duration of these fixations towards each area of interest where embedded brand placement is present. Through the use of this methodology, we wished to accurately bind these fixation patterns to prove our theory that as distraction levels rise, participants' attention towards embedded brand placement falls and vice versa as Young-nam Seo et al. (2018) similarly uncovered.

Another aspect of our study involved a prior involvement and demographic survey which allowed us to link participants involvement level to potential brand recall. Below, the components of our study are detailed and provide scientific backing to which we have built the foundation of our study upon.

1.1.1 Viewer Involvement and Brand Recall

An outside factor considered within this research is the subject's prior involvement with spectating esports. As Walreaven et al. (2014) states, individual involvement with the event and with the interest category have significant positive effects on the individual's probability of correct sponsor recall. Therefore, a viewer's individual involvement is an important factor affecting interest in memorizing advertising messages. Morman (2012) further supports this claim stating, "Memory retrieval of embedded advertisements is highest among viewers who were most involved with a match broadcast". Another aspect of involvement is the frequency of viewership. The frequency of attendance to games from sports fans positively correlates to the ability to recall ads (Turley, 2000) therefore those who frequently watch League of Legends esports matches will likely be able to recall advertisements with additional clarity compared to those who do not watch League of Legends esports and just play the video game casually.

Moreover, previous research has also shown the higher emotions are during sports games, the better brand retention is (Maricic et al. 2019). Watching a game with company and outside the home also leads to more intense levels of attention towards broadcast (Moorman, 2012). Although we are not measuring the emotional state of participants within our study, the prior research mentioned reinforces the importance of understanding participants prior involvement when evaluating the data we have acquired to determine factors affecting brand recall.

1.1.2 Long-term vs Short-term sponsors affecting recall

It has been articulated that advertisers that buy space at single games, rather than season-long packages are less likely to have their advertising messages recalled. The most recalled advertisements are from firms that use long-term advertisement

strategies (Turley, 2000). Mastercard has been present for two seasons whereas brands like Oppo, Mercedes Benz, Cisco and Spotify have only just appeared during the Worlds 2020 games. Given these research points, we expected long term sponsors to have a higher likelihood of being recalled.

1.1.3 In-Game Dynamics

Esports just like traditional sports have climaxes and highlights. Just as basketball fans go wild when a three pointer goes in, equivalently esports fans get exhilarated and tend to fully concentrate during fight scenes. An example would be a final five on five team fight in League of Legends where both teams engage into a hectic brawl that could decide the fate of the game. A previous study explains perfectly how attention can fluctuate and be differently allocated in the context of esports. “As gameplay becomes more exciting and arousing, spectators of esports are likely to pay their attention to the primary feature of game broadcast and less attention to the secondary feature of virtual advertisements” (Grigorovici and Constantin 2004; Lang 2000). In other words, the more esports viewers are elated by the gameplay of the broadcast, the less attentional resources are going to be allocated towards embedded brand placement.

The participants in our experiment are presented with three different broadcasting scenarios. This is to determine how brand placement performs under differing gameplay situations. From a previous study (Young-nam Seo et al. 2018) we employed the terms battle scene and non-battle scene. These terms are used to describe two different gameplay scenarios. For example, a team fighting scenario (where the two teams fight each other) is a battle scene whereas a player earning gold and experience by acquiring resources in the map is a non-battle scene.

We wish to test the Limited Capacity Theory (See Theoretical Framework) in our study which is why the gameplay scenarios or in-game dynamics (non-battle scene, battle scene) are individually assessed.

1.1.4 Distractors

Within competitive gameplay there are often moments where intense battle scenes climax and are the sole focal point for spectators. When these scenes overlay embedded brand placement, it is reasonable to assume the viewers focus will not be on consuming advertisement messages. It has been relayed through various studies that visuals (Hoyer et al. 1984) as well as music can distract consumers from advertising messages (Cassidy et al. 2007, Oakes et al. 2006, Nader et al. 2003).

Nader T. & Yih Hwah Lee (2003) states that fast paced music interferes with verbal processing more than complex images which lead us to consider music as a bigger distractor than imagery and therefore is noted within the assessment for the distraction

levels of our independent variable. Another study states performance of cognitive tasks is lessened in the presence of music compared to silence (Cassidy et al. 2007) meaning the processing of information is therefore slowed leading to lower levels of advertisement recall. This follows with slow-tempo music producing significantly higher levels of ad content recall compared to fast-tempo music (Oakes et al. 2006). During such high intensity moments of gameplay, commentators speak with fast paced remarks, sometimes shouting observations about strategic moves made during segments. Paired with copious sound effects from the battle scenes themselves, we speculated our research would reflect the results of these prior studies. In general, the main consensus among these studies cited is that as distraction levels increase, recall and comprehension decline (Thomas et al. 2011).

1.2 Purpose and research questions

Drawing on the problem statement, it is evident that advertisements do not perform well while embedded amongst scenes with high distraction levels and in-game dynamics. Further it is evident that viewer involvement is a key factor affecting the recall of such advertisements as well as whether these adverts are using long-term or short-term marketing strategies. Consequently, the purpose of this study was to examine how well embedded brand placement in the form of Arena Banners perform under fluctuating distractor conditions.

The aim of this study was to examine how the embedded brand placement system within League of Legends performs during different spectating scenarios by employing an eye tracking methodology while also assessing data gathered from the test subjects to link their potential differentiation in viewing patterns. The experiment included a brand recall exercise to further assess how prior involvement affects recall with the inclusion of how long-term branding strategies affects recall. Video clips from the 2020 World Championship were employed during the experiment to showcase varying levels of distractors.

The study took place while using in-person and remote experiments. A demographic survey as well as a prior involvement survey was issued to the participants to gather information and assess participants involvement with League of Legends and the respective esports scene. Furthermore, an eye-tracking experiment was performed on the participants who were asked to view three clips from the Worlds 2020 games. The three clips consisted of low distractor footage, medium distractor footage and high distractor footage. After the eye tracking exercise participants answered a final survey that consisted of a brand recall exercise in order to further test how well they could recall brands presented within the clips previously seen and in connection to their

prior involvement as well as assessing how long-term vs short-term sponsors performed.

An eye tracking tool was utilized. The study utilized the eye tracking methodology of fixation count and fixation duration to examine the effect of embedded brand placement on viewers' attention (As seen at Otterbring, Wästlund and Gustafsson 2016). Fixation count was utilized to measure how many times the viewer's gaze point reached an embedded brand placement whereas Fixation duration measured the intensity of a gaze. Simply, how long did the gaze point fixate on a specific embedded brand placement.

Our first research question targets the eye tracking segment of the experiment. During this phase, we wanted to discern how brand placement performed under differing levels of distraction. As mentioned in the problem statement, the main consensus among researchers is that as distraction levels increase, recall and comprehension decline (Thomas et al. 2011), leading us to ask:

RQ1: How does embedded brand placement perform in terms of fixation count, fixation duration during varying distractor levels and in-game dynamics

Our second research question focuses on the prior involvement survey. Considering the component in our problem statement titled "Viewer involvement and brand recall", we discerned prior involvement to be an important outside factor to acknowledge when assessing brand recall. The frequency of attendance to games from sports fans positively correlates to the ability to recall ads (Turley 2000) which lead us to ask the question:

RQ2: To what extent does prior participant involvement with the esports scene of League of Legends affect brand recall.

And finally, our consideration towards how well long-term sponsorship performs versus short-term sponsorship when viewing the statement from Turley (2000) "The most recalled advertisements were from firms that used long-term advertisement strategies" garnered the question:

RQ3: To what extent can participants with prior involvement recall long-term sponsors vs those who have little or no prior involvement.

Following research question one, the following two hypotheses were formed:

H1: Participants will be less likely to recall embedded adverts from clips with more audio and visual distractors as well as climactic in-game dynamics.

H2: Fixation count and fixation duration will be lower during the battle scene based on the Limited Capacity Theory.

Finally, we hypothesized that participants with less involvement might not seek context of the game state they are watching and instead will only casually focus on the gameplay of the broadcast which might lead to higher fixations towards embedded brand placements. On the other hand, high prior involvement participants will hypothetically tend to seek and understand the game state by observing different statistical figures present during the broadcast since they are generally more invested both in the game and the esports scene thus lessening the potential of being exposed to embedded brand placements. This leads us to hypothesize that:

H3: Fixation count and fixation duration will be higher towards embedded brand placement amongst participants with lower involvement levels.

1.3 Scope and limitations

This study focused on participants' visual attention towards embedded brand placement within esports gameplay from the game title League of Legends. The study used a mixed method approach by conducting an experiment that involved an eye tracking as well as a brand recall exercise and a survey that holds demographic related questions in addition to questions related to the participants' involvement levels.

The first limitation of our study was that we only researched the potential participant fixations within one esports title. This limits the scope of understanding how other esports titles might affect fixations due to the varying styles of gameplay, game genres target audiences and advertising practices.

The second limitation is logistics related. At the time of writing this paper, the COVID-19 pandemic has affected the interactions we could have with people, limiting us, the researchers, from safely interacting with a high volume of participants. Therefore, the participant sample size was smaller than we wanted, only garnering 15 participants for the experimental phase of this study.

The third limitation is again affected by the pandemic. This experiment is using RealEye, an online platform designed to conduct screen-based webcam eye tracking research which worked for its intended purpose in this experiment but is not as accurate as other eye tracking hardware we would have access to if we were able to use tools provided by our university. Using eye tracking hardware at the time of writing this paper would also increase the potential spread of COVID-19 as it would have had to be shared amongst participants and would not have been a safe option during this global health crisis.

1.4 Disposition

The structure of this report first addresses the research gap our paper hopes to fill. Next, the different factors we are considering within our experiment are discussed.

Thereafter, our report details the method and implementation to which our experiment follows. Such details include methods for data collection, analysis, elements regarding the validity and reliability within our study prefacing the individual components of our experiment.

Next, the results from our study are discussed in depth along with the methods used. Finally our paper reviews the scientific and practical implications of our results as well as the potential further research which may result from our own work.

2 Method and implementation

15 participants were gathered to perform in the experiment ranging from dedicated fans of the esport scene to casual League of Legend players. These subjects are college students around the ages of 20-30. Since these subjects are above the age of 18, they were able to consent to participate in the experiment, eliminating the need for parental consent.

The participants first answered a short survey with demographic related questions, and after were presented with questions related to their personal engagement with the game and the esport scene. That way we could determine how embedded brand placement affects spectators with differing involvement levels. As mentioned in our problem statement, it was paramount to assess individual involvement in order to fully understand external factors which might correlate to the results gathered from the remainder of our experiment process. The questions presented in this section were:

- “What is your hour count in League of Legends? Please refer to <https://wol.gg/> to get a precise answer.”

We wanted to obtain numeric data (hour count) to assess personal involvement with the game itself.

- “How often do you watch League of Legends esports?”

This question aimed to discern the participants' involvement with the League of Legends esports scene. The participants had the choice to answer ‘Consistently’, ‘Often’, ‘Rarely’ and ‘Never’, we chose the wording of these answers to eliminate the chance of misinterpretation between options.

- “Did you watch the Worlds 2020 games?”

This question aimed to discern the participants' involvement with the actual League of Legends event that this research initiative was examining. With this information, we could attempt to predict participants who were more likely to recall brands based on prior exposure to the same advertising practices. The participant would be able to simply answer yes or no to this question.

The participants were then presented with three different gameplay scenarios containing three different distractor levels lasting 60 seconds each. From a previous study (Young-nam Seo et al. 2018) we have employed the terms battle scene and non-battle scene. These terms are used to describe two different in-game dynamics. For example, a team fighting scenario (where the two teams fight each other) is a battle scene whereas a player earning gold and experience by acquiring resources in the map is a non-battle scene. We also included a third scene in the experiment that entailed a one on one skirmish between two players. Technically this skirmish is

considered a battle scene but is far off in terms of the climax and the exhilaration that a game defining team fight produces. We employed this third scene in the experiment as it served as a middle ground between a highly intensive gameplay moment and a low intensive gameplay moment. At this point, eye tracking was used to track how many times a participant looked at areas of interest (where embedded brand placement is visible) and to measure the fixations. Specifically fixation count (how many times did a gaze point reach an area of interest) and fixation duration (how long did the gaze point stay in an area of interest).

After the clip viewing phase, the participants took part in a brand-recall exercise to assess the effectiveness of embedded brand placement, observe how prior involvement affects brand recall and evaluate long-term vs short-term sponsorship. Using the data from the prior involvement assessment and from the eye-tracking exercise, we were then able to correlate recall patterns that we hoped would match our prior research to prove our hypothesis.

Assessing the effectiveness of brand placement is an important practice which verifies the performance of an advertising method. Marketers generally use tools like surveys to assess performance (Rachel Fan et al. 2018) and within the brand recall phase of our experiment we intended to do the same. The survey for this was comprised of one question:

- Which brands were featured in banner format during the gameplay of the clips you just watched? (Pick as many as you can recall)

This question was assisted by a multiple-choice answering method where the participant was allowed to select logos to answer the statement. There were 12 logos to choose from, six being the correct answer and the other six being brands that were not featured in the clips shown to participants. From the responses, we then calculated the percentage of correct answers, as well as the percentage of times the Mastercard logo was selected (long-term sponsor) versus the percentage of times other short-term companies were chosen. This was to help us to answer research question three. We also calculated the percentage of correct brands chosen from each distractor level to test our first hypothesis.

Prior to this experiment, participants were not told what the experiment topic was to remove participant bias. This was to ensure the credibility of our results as much as possible. If there were obvious anomalies within the eye-tracking experiment (a participant only stares at one part of the screen the whole time) we would then consider removing them to protect the validity of our results.

2.1 Data collection

The eye tracking solution that was employed is called RealEye. “RealEye (<https://www.realeye.io>) is an online platform designed to conduct screen-based webcam eye-tracking research” (RealEye Technical Whitepaper, 2020). Creating studies, gathering the results, and analyzing the data is done in the web browser.

Taking into consideration the first research question “How does embedded brand placement perform in terms of fixation count, fixation duration during varying distraction levels of in-game dynamics (battle scenes, non-battle scenes).” We end up with the following terms that demand data collection clarifications: fixation count, fixation duration.

By employing RealEye we were able to access a plethora of built-in tools that correspond to data analysis and data collection methods. Firstly, in order to measure fixation count & fixation duration we had marked Areas of Interest (AOI) on the clips that were viewed by our participants. In our case the Areas of Interest are where embedded brand placement is present. After we had marked an AOI, the built-in tools RealEye employed automatically generated on a selected timeframe of the clip, fixation counts in numerical value (In simpler terms, how many times did the gaze point reach the AOI) as well as fixation duration in seconds (How many seconds did the gaze point stay inside an AOI). These values were then compiled in a table that provided us with an overview of how each participant performed during the eye tracking experiment.

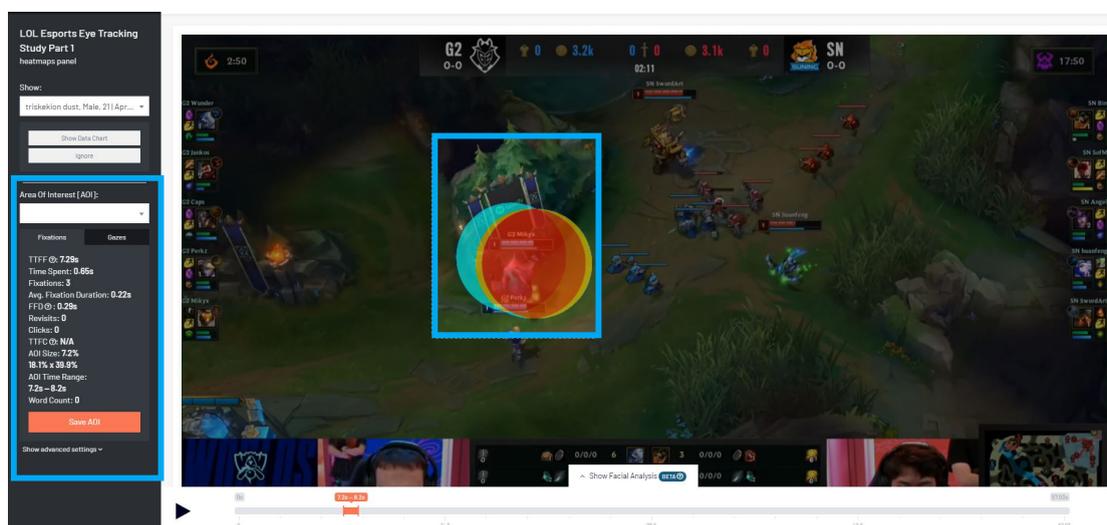


Figure 2. On a selected timeframe we can define an AOI and collect fixation count & fixation duration values for that specific AOI.

The method of collecting eye tracking data in the context of our study was via a within-subjects design. “Within-subjects design uses one group of participants and tests them under all treatment conditions. The within-subjects design repeats

treatments per individual, hence it is also known as the repeated-measures design.” (Duchowski 2007)

Surveys have been used to collect demographic information and prior involvement information. The demographic survey exists to gather general background information on participants such as age, gender, and occupation. The implementation of a demographic study is standard procedure within research studies involving participant input and for that reason, it has also been included within our own study. These inputs have then been compiled in a table to understand the background of each participant in relation to the results of the experiment.

The prior involvement survey serves as a method to obtain data which has then been linked to the responses within the brand recall exercise. As noted by Turley, S. (2000), “The frequency of attendance and involvement positively correlate(s) to the ability to recall ads”. Turley, S (2000) employed a survey within their research to measure prior involvement, which has likewise been emulated within our research. By involving the use of a prior involvement survey, we hoped to identify patterns which would answer research question two: “To what extent does prior participant involvement with the esports scene of League of Legends affect brand recall.” as well as research question three: “To what extent can participants with prior involvement recall long term sponsors vs those who have little or no prior involvement”.

With regards to research question two, we have monitored the link between higher hour count with the game itself, extended frequency of Esport viewership, and whether participants already viewed the Worlds 2020 games. From this, we expected a positive correlation between these factors leading to these specific participants getting a higher percentage of correct answers within the brand recall exercise. Alternatively, we also observed the possible adverse effect of low viewer involvement corresponding to a lower percentage of correct answers within the brand recall exercise.

Throughout our research into prior brand recall studies, surveys have been a reoccurring method to test advertising method performance (Maricic, M. et al. 2019, Bennett, R. 1999, Turly, S. 2000, Rachel F. et al. 2018, Djohari, N. et al. 2019). Generally, exercises for brand recall are provided to participants shortly after they have been exposed to advertising messages. Following this information, our brand recall exercise was also administered to subjects shortly after the clip viewing phase of our experiment.

To ensure the validity of the brand recall exercise, it was important to minimize the chance of participants randomly guessing brands present. In an attempt to counteract this, we implemented brands that are not present within any League of Legends esports games. Within a separate study, Bennett, R. (1999) included the name of a

brand not present within their experiment as dummy control. We followed this model, but our experiment used an equal number of dummy sponsors to real sponsors. In total there were six dummy sponsors and six real sponsors.

2.2 Data analysis

Given that there were three experimental conditions in the eye tracking study (three clips with different in-game dynamics) and all other experimental procedures remained unchanged, the statistical parametric test that is used quite often as a test for significance is the Analysis Of Variance, or ANOVA. “ANOVA is a particularly popular analysis tool and is used as a preliminary indicator of (statistically significant) effect.” (Duchowski 2007). Although ANOVA is a popular statistical test in eye tracking research, we decided to not consider it as our participants are of limited quantity and the results wouldn’t show accurate statistical significance.

As mentioned earlier by employing RealEye we were able to access a plethora of built-in tools that correspond to data analysis and data collection methods. In terms of data analysis methods there were a few tools that we adopted in the context of our study and are described in greater detail below.

Firstly, we had the ability to access the analytics dashboard which allowed us to observe the participants eye-tracking data and recordings which helped us gain insights in regards to different gaze point patterns and behaviors towards embedded brand placement while taking into consideration the participants prior involvement with the game and esports scene. Secondly, RealEye allows analysis based on fixations or gaze points. We opted for fixation analysis as we are investigating fixation count and fixation duration towards embedded brand placement. Thirdly, we appointed the built-in AOI creation tool in order to get useful statistics that are solely connected to embedded brand placement and the participant’s eye fixations towards it.

Another useful tool that RealEye offers is eye-tracking data quality info. RealEye assesses each recording and displays a grade from Bad to Perfect. The grade is generated by different parameters that RealEye investigates automatically after a recording. Such parameters are whether eye-tracking data is available for every item showcased, if eye-tracking sampling rate is good or whether data integrity is accurate based on factors such as bad lightning or constant head movement. The platform also calculated the percentage of gazes reaching the screen during the recording in order to ensure that gazes actually reached the screen at a high percentage. This data quality info is of great help during the data analysis because it allowed us to remove recordings that were invalid and would pose a threat to the overall integrity of our findings.

Overall the data analysis occurred by first compiling useful information gathered from the demographics and prior involvement survey, secondly by amassing total fixation counts and fixation duration per scene and per participant as well as including the participants brand recall exercise accuracy. This provided an overview of each participant's gaze point patterns, fixations and behaviors in relation to their prior involvement as well as their brand recall exercise accuracy. This allowed us to gain an overview of each participant's results as well as identifying how each scene performed on average in terms of fixation count and fixation duration across all of our participants in connection to their prior involvement and demographics.

2.3 Validity and reliability

2.3.1 Demographic Survey

The demographic survey existed to gather general data about participants' gender, age and occupation. Age was answered within a text field, gender choices were set as male, female or other, and occupation choices were set as student, employed or unemployed. The validity of this data is reflected on the basis of a trust system as there was a chance that participants might enter false information about themselves due to the personal nature of the questions. We however hoped that this is an unlikely reality and have prefaced the question that the data gathered was only used within the context of this research initiative and will be displayed anonymously.

This data was paired alongside the results of the other stages of the experiment as a footnote to potentially link certain demographic characteristics with the learned results of the experiment.

2.3.2 Prior Involvement Survey

The prior involvement survey existed to collect data in order to learn about a participants' involvement levels with League of Legends as a game and the League of Legends esports scene. As outlined in the chapter 'Method and Implementation', participants were presented with three questions. The first query asked the participant to provide accurate numerical data of their time spent playing League as a whole by using the free online service 'Time wasted on LoL (<https://wol.gg/>). This service worked by the user providing their League of Legends profile name in a request to the site. The site then returned a set of data giving the user the amount of time spent on that profile in minutes, hours, and days. For this question we specifically requested the participant to provide their hour count. Since we were using this known, accurate third-party service, we were confident in the validity of the data that will be provided for this question. As long as this service, or similar services exist, this section of the

experiment can be easily replicated, ensuring the reliability of this data collection method.

The next question in this segment asked how often participants watch League of Legends esports. The choice of answers included ‘Always’, ‘Often’, ‘Rarely’ or ‘Never’, which we believed are discernible notions of involvement.

The data gathered from this question hoped to categorize a participant’s prior interest in League of Legend esports and also generalize their prior exposure to past brand placement.

As quoted by Martyn, H. and Atkinson, P., ‘The value of respondent validation lies in the fact that the participants involved in the events documented in the data may have access to additional knowledge of the context’. Acknowledging this quote, it was therefore important to understand the extent of prior knowledge participants have regarding the context of the experiment in order to comprehend the validity of responses. For that reason, this experiment only used League of Legends fans to augment the external validity of these results following the Turley, S. (2000) experiment model.

Similar to the demographics survey, participants could potentially lie about their answer, however we believed this is unlikely as this question is relatively impersonal and cannot be used to identify them in outside contexts. Again, the validity of the data gathered from this query was based on a trust system that we hoped would work in our favor. This question and its structure can be easily replicated granted future replicators use participants with a background interest to the context of their experiment.

The last question of this segment asked if participants watched the Worlds 2020 esports game that the eye tracking exercises takes clips from. The choice of answers was simply yes or no. This question aimed to identify participants who have potentially been exposed to the same advertising messages that were shown in the clips within the eye tracking exercise. By categorizing participants this way, we expected the likelihood of them accurately recalling brands within the brand recall exercise to be higher.

2.3.3 Eye Tracking Exercise

Studies that employ RealEye are proven to be around 110px accurate which allows analyzing user’s interaction on a website with precision reaching the size of a single button (RealEye Technical Whitepaper, 2020). This accuracy threshold was sufficient in the context of our study since embedded brand placement surpasses the size of an average website button. The gaze point is predicted with frequency up to 60Hz (RealEye Technical Whitepaper, 2020). “RealEye uses the computing power of a

regular PC/laptop to run AI (Deep neural network) that analyzes images coming from a webcam. The AI detects the panelist's face, pupils and predicts a gaze point.” (RealEye Technical Whitepaper, 2020).

2.3.4 Brand Recall Exercise

The brand recall exercise consisted of a multiple-choice style survey displaying six shown brands and six dummy brands; these choices were assisted by pictures of the brands. The participant was asked to select any brands they can recall from the eye tracking exercise. The responses collected from this exercise were categorized into percentages of correct and incorrect answers per participant. These percentages were then linked to the prior segments from the experiment to conclude the answers for our study. As mentioned previously in the chapter ‘Data Collection’, dummy brands (Bennett, R. 1999) were used to alleviate participant bias to help sustain the validity of the study. As long as the foundation for the eye tracking study can be replicated, the linked brand recall exercise can likewise be replicated.

2.4 Considerations

As mentioned in the limitations due to the pandemic we unfortunately didn’t have access to actual eye tracking equipment that would otherwise be provided by the university. There are also health concerns with using physical eye tracking equipment in the form of headgear that could potentially assist in the spread of COVID. Therefore, we chose RealEye because its effectiveness is sufficient in the context of our study and would provide fruitful results.

Due to the nature of COVID laws at the time of writing this paper within our respective countries of residence, only one of us hosted the experiment. Since this research initiative consisted of an English and a Greek researcher it was decided that the in house experiments were going to take place mainly in Greece, since COVID had not impacted Greece the same way it had impacted the UK. However, some internationals that met the requirements to take the experiment remotely were considered. Therefore, our participant group was formed of Greek nationals and some internationals, and our surveys were adapted to accommodate both English and Greek readers.

Another important consideration was in regards to ethics and privacy. Since our experiment employed a webcam to measure gaze point patterns it was important to outline during the experiment that this data was only used for the sake of this study and wasn’t handled in any other way. Furthermore, it was important to clarify that the webcam is only used to measure gaze point patterns and no video content of a participant’s face will be produced or handled during this research initiative. Since we are employing demographic and prior involvement surveys, we added a note that

clarified that all entries will be kept anonymous and would only be used for the sake of this research initiative. We understand the value of privacy and we wished to conduct this study in a way that does not threaten this important ethical concern.

Finally, it should be noted that within our surveys, we requested the participants provide their League of Legends ID and not their real name. This is so we could link the different components of the experiment (demographics, prior involvement, eye tracking exercise, brand recall exercise). This was explained to participants in simpler terms so they would understand what they are consenting too. Again, it was reiterated to the participants that all entries will be kept anonymous and would only be used for the purpose of formulating our research.

3 Theoretical framework

3.1.1 Eye Tracking Methodology & Theory

Eye movements recorded over advertisements are particularly informative because scan paths immediately provide a visual depiction of whether the intended text or object was fixated upon (or at least scanned over) (Duchowski 2007). In our study we used the following eye tracking metrics in our methodology as referred to in Duchowski's book "Eye Tracking Methodology: Theory & Practice". Area of Interest (AOI) which refers to a rectangular ad region that an eye tracking study wishes to investigate specifically. In our context the AOI is the area where embedded brand placement is visible. Fixation count refers to the amount of fixation (gaze) points within an AOI (Area of Interest). Lastly, fixation duration is an indicator that assesses the intensity of a gaze. In simpler terms how long did a gaze fixate on a specific object.

When it comes to collecting eye movement data, we wish to consider Duchowski's advice and collect data following the KISS principle: Keep It Short and Simple. "Although a good rule of thumb in general, in the context of eye tracking, KISS is particularly important for reasons of data manageability. "Specifically, KISS suggests that eye tracking tasks be limited in duration to minutes if not seconds, rather than hours." (Duchowski 2007) thus our experiment is going to employ 60 second clips. That way we avoid huge volumes of recorded data and allow us to calibrate the equipment frequently thus improving the accuracy of our results.

3.1.2 Limited Capacity Theory

The Limited Capacity Model of attention explains that there is a limit to an individual's total attentional capacity and that limited capacity can be used either for a primary task or for a secondary task. Traditionally, the more attention is allocated to the primary task, the less attention is given to the secondary task mainly because as mentioned earlier the attentional capacity is limited and it is primarily allocated by the

primary task and cannot be used for any other tasks (Kahneman 1973, Lee and Faber 2007, Lynch and Srull 1982).

Applying the Limited Capacity Theory to our study the primary task was the broadcast of the gameplay, while the secondary task was the embedded brand placement. The Limited Capacity Theory in the context of our study posed that as gameplay becomes more exciting and arousing, spectators of esports are likely to pay their attention to the primary feature of game broadcast and less attention to the secondary feature of virtual advertisements (Grigorovici and Constantin 2004; Lang 2000). “The more esports viewers are immersed into the game play, the less their attentional resource is likely to be allocated to the virtual ads.” (Young-nam Seo et al. 2018). We wished to test the Limited Capacity Theory in our study which is why the gameplay scenarios (non-battle scene, skirmish scene, battle scene) were individually assessed.

4 Results

In the first section of the results we aimed to present the collected data in an objective and coherent way without personal interpretations, views and evaluations. This took place by presenting the data from each component of our experiment starting from the demographics and prior involvement and followed by the eye tracking and brand recall data.

The experiment was eventually conducted by 15 participants both physically, in a controlled environment and remotely using a VOIP (Voice Over Internet Protocol) software which is used for delivery of voice and video communications via the internet. In total, there were five physical interviews and ten remote interviews that took place. Participants's ages range from 18 to 30 years old, with most participants being 21 and 22 years old. All 15 participants were males with 86.7% of them being students and 13.3% being employed. When observing the prior involvement survey the participants showed fluctuating involvement with League of Legends and the respective esports scene. Low involvement players typically had low hour counts and little to no involvement with the esports scene. These hour counts with the game range from 55 hours to 110 hours and 220 hours. On the other hand, highly involved players tended to have hour counts in the thousands with the highest being 3000 and 5000 hours and in most cases high to moderate involvement with the esports scene. The combined hour count of all participants was a staggering 23,938 hours and the average hour count amongst all participants was 1595 hours.

When it came to the question “How often do you watch League of Legends esports?” The answers were split with 46.7% answering “Often” and 46.7% answering “Rarely”. Only one participant answered “Always” which was the highest option in

regards to this question. Following the last question of the prior involvement survey “Did you watch Worlds 2020?”. 66.7% had watched Worlds 2020 whereas 33.3% hadn’t watched that particular League of Legends esports event.

Moving on to fixations, it’s recommended to refer to the table later in this chapter (figure 4) as it provides detailed fixation figures for each participant; however there were some general observations worth citing. During the non-battle scene the total average fixation count and fixation duration towards embedded brand placement amongst all participants was 8.26 and 1.47s respectively. During the skirmish scene the total average fixation count and fixation duration was 12.9 and 2.04s respectively making it the scene with the most fixations. During the battle scene the total average fixation count and fixation duration was 5.8 and 0.94s respectively making it the scene with the least fixations. Assessing the participant data based on their involvement we witnessed higher fixations amongst participants with low involvement compared to participants with high involvement. Specifically there were 7 participants with low involvement and 7 participants with high involvement. Amongst low involvement participants the total average fixation count and fixation duration towards embedded brand placement across all scenes was 10 and 1.59s respectively. Amongst high involvement participants the total average fixation count and fixation duration towards embedded brand placement across all scenes was 5 and 1.36s respectively.

Lastly, data from the brand recall exercise are presented. The brand recall exercise existed in order to further assess the effectiveness of embedded brand placement, observe how prior involvement affects brand recall and evaluate long-term vs short-term sponsorship. In the brand recall exercise there were 6 real brands and 6 dummy brands. Mastercard, the long-term sponsor had a pick rate of 73.3% whereas Oppo, one of the short-term sponsors had a pick rate of 6.7%. Another important insight from the results are that dummy brands that have a history of esports collaborations were frequently picked. The second highest real brand picked was Alienware with a 40% pick rate, followed by Mercedes-Benz and Secretlab with 33.3%. Spotify scored a 20% pick rate making it the second to last brand in the pick rate hierarchy. Below we present a graph that compiles the results of the brand recall exercise as well as the results of the eye tracking exercise in relation to the other components of the experiment.

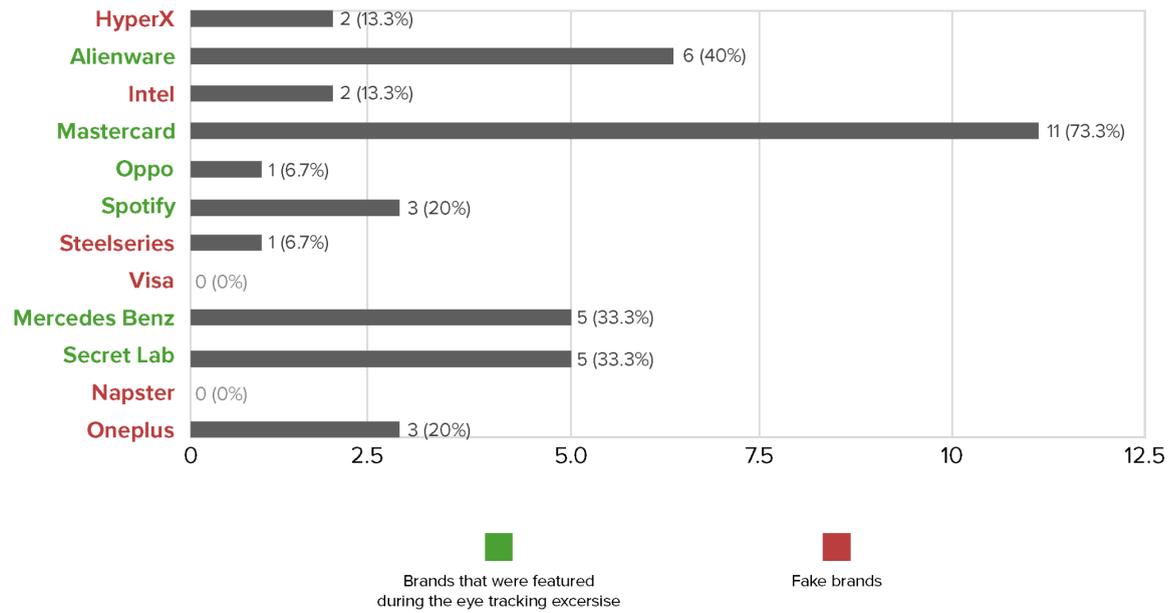


Figure 3. The results of the brand recall exercise. Mastercard, the long-term sponsor, is the most picked brand, whereas Oppo, one of the short-term sponsors, is the least picked brand.

Participants	Fixation Count Fixation Duration		Fixation Count Fixation Duration		Fixation Count Fixation Duration		Involvement with League of Legends (hours)	Involvement with League of Legends Esports	Brand Recall Exercise Accuracy
	Non-Battle Scene		Skirmish Scene		Battle Scene				
A	FC 16 FD 3.02s	FC 18 FD 2.58s	FC 3 FD 0.4s	200 hours	Low	1 out of 6			
B	FC 10 FD 1.66s	FC 7 FD 1.03s	FC 3 FD 0.48s	1305 hours	High	3 out of 6			
C	FC 18 FD 3.38s	FC 6 FD 1.01s	FC 15 FD 2.54s	444 hours	Low	5 out of 6			
D	FC 7 FD 1.31s	FC 9 FD 1.25s	FC 5 FD 1.05s	2000 hours	Very High	4 out of 6			
E	FC 5 FD 1.10s	FC 14 FD 2s	FC 4 FD 0.59s	1876 hours	High	2 out of 6			
F	FC 5 FD 1.05s	FC 11 FD 1.48s	FC 4 FD 0.65s	1400 hours	Low	0 out of 6			
G	FC 14 FD 1.96s	FC 19 FD 2.94s	FC 5 FD 0.68s	55 hours	Low	2 out of 6			
I	FC 5 FD 1.10s	FC 19 FD 3.26s	FC 4 FD 0.75s	2598 hours	High	3 out of 6			
J	FC 6 FD 1.1s	FC 21 FD 3.46s	FC 12 FD 1.75s	3000 hours	High	1 out of 6			
K	FC 9 FD 1.39s	FC 17 FD 2.85s	FC 12 FD 1.93s	5000 hours	Low	2 out of 6			
L	FC 10 FD 1.39s	FC 8 FD 1.24s	FC 2 FD 0.24s	1583 hours	Low	1 out of 6			
M	FC 5 FD 0.81s	FC 8 FD 1.55s	FC 4 FD 0.69s	2007 hours	High	4 out of 6			
N	FC 5 FD 0.93s	FC 14 FD 2.41s	FC 3 FD 0.56s	1222 hours	High	1 out of 6			
O	FC 4 FD 0.82s	FC 14 FD 2.42s	FC 8 FD 1.27s	1138 hours	High	2 out of 6			
P	FC 5 FD 1.08s	FC 9 FD 1.20s	FC 4 FD 0.57s	110 hours	Low	0 out of 6			
Total Average Fixation Count & Fixation Duration		Total Average Fixation Count & Fixation Duration		Total Average Fixation Count & Fixation Duration					
FC 8.26 FD 1.47s		FC 12.93 FD 2.04s		FC 5.8 FD 0.94s					

Figure 4. The results of the eye tracking exercise per participant and per scene, in relation to the data gathered by the other components of the experiment

5 Discussion

The aim of this chapter is to discuss the results of the study in relation to previous performed studies. We also take a closer look at the implications and limitations of our research initiative. Furthermore we wish to initiate a discussion in regards to our findings and observations. This occurred by discerning each component of our experiment in relation to the purpose and research questions and outlining whether we achieved the intended outcome as well as stating important insights gained throughout the process.

5.1 Result discussion

Reflecting on our first research question, we asked:

How does embedded brand placement perform in terms of fixation count, fixation duration during varying distractor levels and in-game dynamics

As mentioned in the results section (see figure 4), during the non-battle scene the total average fixation count and fixation duration towards embedded brand placement amongst all participants was 8.26 and 1.47s respectively. During the battle scene the total average fixation count and fixation duration was 5.8 and 0.94s respectively making it the scene with the least fixations. As a result we have successfully answered RQ1 and we proved that varying distractor levels and in-game dynamics have an effect in embedded brand placement absorption. This can also be observed in previous research such as Young-nam Seo et al. 2018 which stated that “in-game dynamics had a significant effects on viewers’ attention in terms of fixation count and fixation duration” and “participants stared at ads significantly more frequently when ads are displayed during non-battle scenes”. We also fall in line with Young-nam Seo et al. 2018 conclusion which posits that marketers should embed advertisements more strategically by avoiding intensive and possibly immersive game contexts as much as possible.

Our H2 was also proven which stated that fixations will be lower during the battle scene based on the Limited Capacity Theory. Surprisingly the non-battle scene wasn’t the scene with the most fixations however. During the skirmish scene the total average fixation count and fixation duration across all our participants was 12.9 and 2.04s respectively making it the scene with the most fixations.

The Skirmish scene had these high fixation figures however because battling occurred near or on top of embedded brand placement. Consequently, gaze points reached both the primary feature which was the broadcasted gameplay and the secondary feature which was the embedded brand placements. So by basing this observation within the

context of the Limited Capacity Theory, perhaps these fixation figures weren't exactly realistic. Because what the Limited Capacity Theory posed in the context of our study and what (Grigorovici and Constantin 2004; Lang 2000) state is that as gameplay becomes more exciting and arousing, spectators of esports are likely to pay their attention to the primary feature of the game broadcast and less attention to the secondary feature of virtual advertisements. Similarly, Young-nam Seo et al. 2018 further supports the statements above and states that "The more esports viewers are immersed into the game play, the less their attentional resource is likely to be allocated to the virtual ads.". Therefore, it was reasonable to assume that subconsciously advertisement absorption did occur during the skirmish scene but perhaps it wasn't as effective. However, drawing from the brand recall exercise results, Mercedes-Benz which is the focal brand presented during the skirmish scene did score pretty well with a pick rate of 33.3%. However Alienware, a brand that was featured in the battle scene did surpass Mercedes-Benz barely with a pick rate of 40% and it's worth mentioning that Alienware across the climactic battle scene had 44s total embedded brand placement exposure compared to Mercedes-Benz which had 35s exposure on a relatively milder scene in terms of distractions and in-game dynamics.

Moving forward with our second research question:

To what extent does prior participant involvement with the esports scene of League of Legends affect brand recall.

We answered RQ2 by proving that participants with high prior involvement with League of Legends esports were likely to recall a greater percentage of brands based on the brand recall exercise results. However, we've proved H3 which states that fixation count and fixation duration will be higher towards embedded brand placement amongst participants with lower involvement levels. Although, we've observed that fixations were not enough to recall brands effectively during the brand recall exercise. Ultimately high prior involvement effectively influenced brand recall. As Walreaven et al. (2014) states, individual involvement with the event and with the interest category have significant positive effects on the individual probability of correct sponsor recall.

Taking a closer look at H3, as mentioned in the results, amongst low involvement participants the total average fixation count and fixation duration towards embedded brand placement across all scenes was 10 and 1.59s respectively. Amongst high involvement participants the total average fixation count and fixation duration towards embedded brand placement across all scenes was 5 and 1.36s respectively. This hypothesis was formed because we believed that low involvement participants tend to watch more casually and are generally focused on the main aspect of the

broadcast, the gameplay. Whereas high involvement participants tend to check a lot of statistics that accompany the broadcasted gameplay such as what items have players acquired, what is the gold difference between the two teams, what resources have both teams acquired and other insightful statistics that provide context of the game state to the viewer. This was also further supported through observation of the eye tracking results. In figure 5 and 6 there is an example of two participants with opposite involvement levels and their depiction of their total gaze points in heatmap format. The low involvement participant tends to focus in the center of the screen where the broadcasted gameplay takes place and ultimately where embedded brand placement is visible. The high involvement participant does the same but also tends to check the top, bottom, left and right side of the screen where different statistical figures are present.

As a result we hypothesized correctly that fixations would be higher amongst low involvement participants as they tend to watch more casually and are focused in the parts of the screen where embedded brand placement is visible. We also believed that these higher fixation would positively impact their brand recall resulting in a better brand recall exercise score but it turned out that prior involvement plays a significant role and it's crucial for a high percentage of correctly recalled brands.

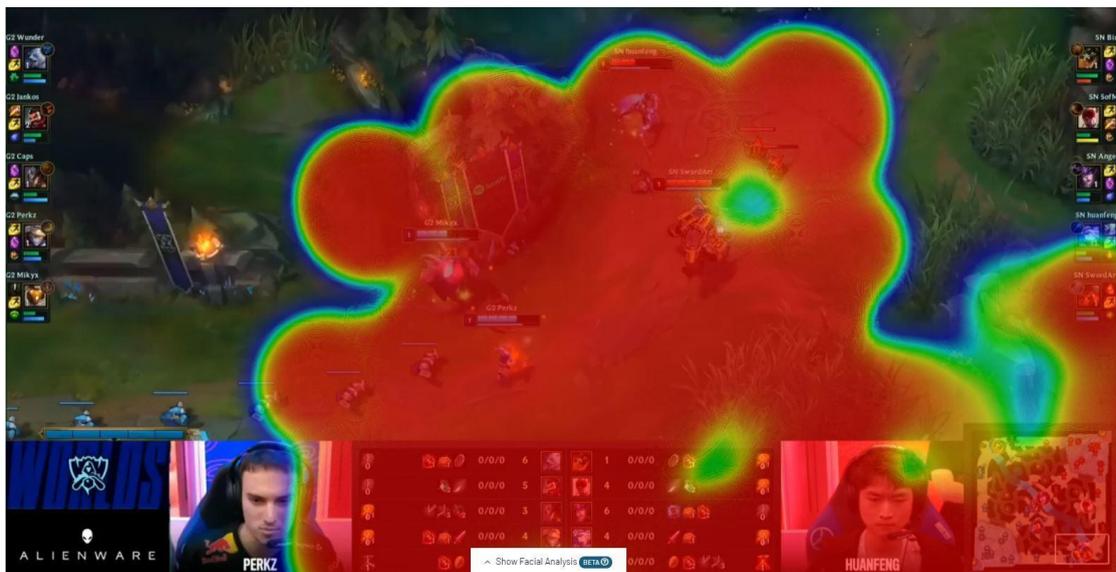


Figure 5. Heatmap of total gaze points of a high involvement participant



Figure 6. Heatmap of total gaze points of a low involvement participant

Sequentially, our third research question posed: To what extent can participants with prior involvement recall long term sponsors vs those who have little or no prior involvement.

Again drawing from RQ2 we've proved that prior involvement plays a significant role when it comes to brand recall. However, when it comes to the long-term sponsor, Mastercard there were a few useful insights worth mentioning. Firstly Mastercard performed the best in the brand recall exercise making it the most recalled brand with a pick rate of 73%. Meaning that both high and low involvement participants picked it. Mastercard is visible across all scenes with a total embedded brand placement exposure of 37s. It's worth noting that Mastercard being the long-term sponsor had reserved the best advertising spot in the map, the middle lane. Specifically the whole middle lane of the map is covered in Mastercard Arena Banners. The reason why the middle lane is the most popular part of the map is because it connects both the top and bottom side of the map. It acts as a cross road between useful resources ready to be acquired by both teams. It is prone to a lot of action from the early stages of the game to the later stages. The middle lane is the most popular role as players are expected to do a little bit of everything and are able to participate in the activities of any of their teammates. Subsequently, the broadcast tended to focus a lot on the middle lane, meaning more embedded brand placement exposure. In conclusion low involvement players were as well able to recall the long-term sponsor, Mastercard because they were exposed to the brand significantly and effectively.

On the other hand, the short-term sponsor Oppo didn't perform very well. Oppo banners aren't situated in focal parts of the map and across all scenes it holds a total

embedded brand placement exposure of 13s. Oppo was recalled 6.7% making it the least recalled brand. In conclusion, as it has been articulated before by Turley (2000), advertisers that buy space at single games, rather than season-long packages are less likely to have their advertising messages recalled. “The most recalled advertisements were from firms that used long-term advertisement strategies” (Turley 2000). Given these statements and the results of the brand recall exercise we have successfully proved that long term sponsors will have a higher likelihood of being recalled. However there are some background insights in regards to the brand, Oppo that are worth mentioning.

Within our results, the short-term brand Oppo objectively performed the worst out of all the short-term sponsors. Oppo was founded in 2004 catering for the Chinese consumer electronics market and is primarily known for its manufacturing of smartphones. In June of 2016, Oppo became the largest smartphone manufacturer in China. When observing the top selling smartphones by region in 2019, Oppo is the leading brand. However, when looking at Europe, Oppo is nowhere to be seen in the top five. Instead the leader board is dominated by brands Samsung and Apple. Given these statistics, the success of this Chinese founded brand is yet to peak among European consumers. On the other hand, the short-term brands featured within this study are relatively well known. Spotify and Mercedes-Benz were both founded in Europe and are historically well known and leading global brands in the music and automotive industries. Since our experiment exclusively employed participants within Europe, we believe that perhaps one of the reasons the brand was the least recalled was because it is a brand Europeans are least familiar with.



Figure 7. Top Selling Smartphones by Region 2019 as reported by Counterpoint

Moving on to H1 which stated that participants will be less likely to recall embedded brand placement from clips with more audio and visual distractors as well as climactic in-game dynamics. It has been relayed through various studies that visuals (Hoyer, W., Srivastava, R., & Jacoby, J. 1984) as well as music can distract consumers from advertising messages (Cassidy et al. (2007), Oakes et al. (2006), Nader et al. (2003). In general, the main consensus amongst these studies cited was that as distraction levels increase, recall and comprehension decline (Thomas et al. 2011). The brands Alienware and Secretlab were solely featured in the battle scene which consisted of climactic in-game dynamics and had a plethora of audio and visual distractors. Both brands shared the same advertising spots so their total embedded brand placement exposure was identical and it sits at 44s. That number might seem a lot but it needs to be taken into consideration that that embedded brand placement occurs in the battle scene, an extremely climactic scene in terms of in-game dynamics and distractors. These brands performed well considering they were featured during the battle scene. Although we observed that prior involvement plays a role because low involvement participants didn't tend to pick those two brands. In a way this hypothesis is true and false because although Secretlab and Alienware did perform well, (better than Spotify that sits at a 20% pick rate and was featured on the non-battle and skirmish scenes) low involvement participants didn't tend to pick them during the brand recall exercise.

5.2 Method discussion

As examined in section 1.2 of this paper, the purpose of our research was to investigate how embedded brand placement within esports perform under differing spectating scenarios.

The objectives for our research being:

- Assessing data gathered from the test subjects to link their potential differentiation in viewing patterns.
- Brand recall exercise to further assess how prior involvement affects recall with the inclusion of how long-term branding strategies affects recall.
- Using video clips from the 2020 World Championship to explore the effect of varying distractor levels and in-game dynamics on eye tracking fixations and brand recall.

From our experiment we managed to collect data from 15 participants which has provided a modest insight for our predicted outcomes within this topic. To which degree we have succeeded in answering our research questions is discussed in greater detail below.

RQ1: How does embedded brand placement perform in terms of fixation count, fixation duration during varying distractor levels and in-game dynamics

This question has been answered through the data gathered from the eye tracking exercise of our experiment. The method implemented for this phase used eye tracking software RealEye to record the amount of times subjects would look at the embedded brand placements within the clips shown (fixation count and fixation duration). From the information gathered during this stage, we had been successfully able to observe viewing patterns concerning our research question.

As previously mentioned in the introduction to this paper, the aim of our exploration into the topic of embedded brand placements within esports was to provide a foundation for future research. As a result of this, we believe we have achieved this goal, albeit this was not without stumbling across some issues amidst our experimentation process.

Originally, the experimentation process was to exclusively include in-person interviews with our subjects. However, due to the limited number of physical participants resulting from the COVID-19 pandemic, only five interviews were conducted in person. The remaining ten were conducted remotely. The remote interview experiments were carried out using the VOIP (Voice over Internet Protocol) software, Discord. Discord allowed us to conduct the experiment remotely with participants by allowing us to communicate and guide the subjects through each component of the experiment.

The limitations of this compromise ultimately affected the controlled nature of the experiment. As soon as part of the experiment became orchestrated by a third party (the participant), us, the researchers consequently lost control of the total validity of the test. In future replications of this experiment, we strongly advise physical interviews that are controlled solely by the researcher. This is so outside factors which might affect the experiment can be minimized and therefore ensure the validity and reliability of results.

Next, it is imperative to talk about our experience regarding the eye tracking exercise. The software used in our research provided us with an array of tools such as area mapping, along with the ability to track fixation counts and fixation duration. This assisted us in time-saving along with being an affordable and easily accessible solution for our short term study.

All 15 participants granted webcam access, allowing for their faces to be detected and properly calibrated with their respective webcam equipment. The built-in eye tracking data integrity tool RealEye employs, which assesses the quality of data provided states that across all three scenes the average data integrity score is 94% meaning that the data we gathered from this experiment is accurate and credible. Only two participants were removed as their results weren't accurate and their equipment wasn't calibrated properly. Furthermore, across all three scenes, gazes reached the screen on average 92% with the sampling rate being no lower than 30hz and no higher than 60hz. The fluctuation in sampling rate exists because each participant that engaged in the experiment remotely owns different equipment and webcam capabilities differ from model to model. The requirements during participant recruiting did pose however that a capable webcam around the price point of \$100 was necessary in order to conduct the experiment properly and this requirement had been cross checked before conducting the eye tracking exercise to ensure credible eye tracking results. However, for those who wish to obtain better quality data, we recommend investing in physical eye tracking equipment since it provides data with superior accuracy as the hardware is better adapted for eye-movements.

RQ2: To what extent does prior participant involvement with the esports scene of League of Legends affect brand recall.

This question was answered through the use of a prior involvement survey that then linked participants to a brand recall exercise. The prior involvement survey was a success in that subjects had no problem understanding the questions asked within this section.

However when it came to the brand recall exercise, there was some confusion with selecting brands from the clip viewing phase or from their prior knowledge of brands associated with League of Legends. The participants were then assured that they could answer based on both factors. When replicating this phase of the experiment, we recommend better defining the preface question to this experiment. However, since our tests have accounted for the outside factor of prior participant involvement, we anticipated that subjects would answer based on their brand knowledge outside of the advertising messages witnessed in the eye tracking exercise of the experiment. Furthermore, when answering RQ2, we were deliberately seeking brand recall patterns based on prior involvement.

As far as establishing a correlation between prior involvement and the ability to recall brands, we have been successful in collecting relevant data through this linked survey method. We believe this method has yielded valid results and the fact that it can be easily replicated ensures its reliability. Nevertheless, it goes without saying that this experiment would yield better results with a bigger sample of participants. It is harder to analyse small scale data without generalizing certain patterns.

RQ3: To what extent can participants with prior involvement recall long-term sponsors vs those who have little or no prior involvement.

Our third research question has been answered using the same process used to solve our second research question, however this time, the long term sponsor Mastercard has been highlighted in order to investigate the impact of long term advertising messages.

A factor that we didn't consider thoroughly however was the hierarchical placement of this brand within the game. As we discovered later on through our experimentation process, Mastercard reserved the most viewed area of the game, the middle lane. The effect of this placement in a popular area therefore boosted its exposure time giving it an advantage over those short-term sponsors who consequently received less exposure. However within our experiment, Mastercard was the third most visible across all scenes with a total embedded brand placement exposure of 37s. The most visible sponsors being Alienware and Secretlab with a shared exposure time of 44s. Therefore we believe that apart from duration of exposure it is important to take into consideration the effectiveness of the embedded brand placement itself as well as the context of the in-game dynamics and distractions that these brand placements are presented in within future studies. Lastly, reflecting back to the discussion of RQ2, a bigger population of participants should be employed in future experiments to generate a better detailed perception.

6 Conclusions and further research

Within this chapter, we present our conclusions from the study and provide suggestions to those who wish to conduct further research within this field.

6.1 Conclusions

The aim of this paper was to investigate how embedded branding performs within the context of esports. Although as mentioned, there have been many previous studies which have delved into branding within traditional sports games such as football, none have covered how advertisements within this novel but vastly growing digital product perform in terms of embedded brand placement meaning brand placement that is naturally integrated within the game and visibly featured in the broadcast. We believe that through our study, we have successfully contributed to the foundation of research surrounding embedded brand placements within esports through our investigation of practical factors affecting to which extent viewers are able to consume these advertising messages. These factors being prior involvement, how differing spectating scenarios, distractions and in-game dynamics affect fixations on advertising messages and finally how the above factors contribute to overall brand recall.

6.1.1 Practical implications

The practical implications from the results of this study we hope will help advertisers to make a better informed decision about collaborating with esports events. Hopefully our research will also provide a better perception in regards to how they might expect their advertising messages to perform. This study also reiterates that long-term advertising strategies are favourable for enhanced recall of branding messages and are a wise investment for those who wish to target an emerging population of young adults.

6.1.2 Scientific implication

In regards to the scientific implications of our findings there are some aspects of our research that have confirmed past theories and other findings that have mildly challenged prior research. Yet the general consensus of this paper's results support past research used to formulate our research questions.

For example, our evaluation of how distraction levels affect fixation counts and fixation durations have provided some interesting data. As covered in the result discussion of this paper, our findings indicate that participant fixation counts and the duration of those fixations are highest during the investigated mid tier spectating scenario. However, as mentioned, this is not a reliable indicator of advertisement absorption as the skirmish scenes occurred over mapped areas of interest (the

advertising messages). Apart from this anomaly, fixation counts were lowest during the high distractor scene which supports prior research in this area (Cassidy et al. (2007), Oakes et al. (2006), Nader et al. (2003) Hoyer et al. (1984).

This paper's investigation into viewer involvement and brand recall also supports past research statements such as "The frequency of attendance to games from sports fans positively correlates to the ability to recall ads" (Turley, 2000). This is evident from the higher average of correct sponsors being recalled from high to very high prior involvement participants.

The next topic which is supported by our findings is the notion that long-term advertisers are more likely to have their advertising messages recalled compared to those of short-term advertisers (Turley, 2000). Our fixation on the long-term brand Mastercard within our research assists this theory as it was the most recalled brand with a pick rate of 73% across all participants.

Lastly our paper advocates for the Limited Capacity Theory. As taken from the theoretical framework chapter of this paper, the Limited Capacity Theory in the context of our study poses that as gameplay becomes more exciting and arousing, spectators of esports are likely to pay their attention to the primary feature of game broadcast and less attention to the secondary feature of virtual advertisements (Grigorovici and Constantin 2004; Lang 2000). The lower fixation counts and duration of those fixations within the high distractor scene during the clip viewing phase of the study supports this concept.

6.2 Further research

In conclusion, this paper has assessed that while the theories discussed are relevant to the research conducted, the methods used to test these concepts are in need of refinement in order to advance data collection and evaluation. When conducting further research within this topic, it is monumental to improve upon the approaches deliberated within the method discussion chapter of this paper.

In short, more participants are essential in order to obtain a better perception of the theories explored within this topic. In-person interviews performed in a controlled environment should also be considered to minimize outside factors which might affect results. The popularity of the locations embedded brands are situated on the playing field should also be assessed to better understand the success of those brands being recalled. It would be also fruitful if this study was examined within other esports scenes that include embedded brand placement but with the element of animation. Simply evaluating the effect of ad animation as (Young-nam Seo et al. 2018) did but in the context of embedded brand placement. And finally better eye-tracking hardware should be utilized to obtain better quality data.

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