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**Efeitos do ambiente na recordação e
reconhecimento de marcas na publicidade
in-game: A FIFA 15 Study**

**Environment effects on recall and recognition of
brands in in-game advertising: A FIFA 15 Study**

Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Comunicação e Multimédia, realizado sob a supervisão científica do Dr. Oscar Mealha, senior lecturer do Departamento de Comunicação e Arte da Universidade de Aveiro, Portugal, e co-orientada pelo Dr. Carsten Möller, professor do Institute of Communication and Media Research na German Sport University Cologne, Alemanha.

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Palavras-chave

Videogogos, memória, lembrança, reconhecimento, product placement, publicidade

Resumo

Estudos mostraram a eficácia geral do Product Placement e como a publicidade in-game evoluiu e como ela se compara à de outras mídias. Com a evolução da tecnologia e de todas as novas formas de consumir a TV, é importante que as marcas e os anunciantes explorem novas formas de atingir o seu público-alvo. Enquanto os videogames existem como uma mídia por muitos anos, eles são capazes de comunicar publicidade com a mesma qualidade de outras mídias devido ao aumento do poder de processamento. O mercado dos videogogos é agora também muito mais atraente para marcas como é uma outra maneira de atingir milhões de consumidores. Esta dissertação irá explicar o papel do ambiente na eficácia do Product Placement em termos de recordação e reconhecimento em videogogos. Para responder a esta pergunta, utilizando os princípios de recordação e reconhecimento, bem como a memória implícita e explícita, foi elaborado um estudo onde os participantes foram divididos em quatro grupos diferentes em termos de ruído e distrações presentes na sala, bem como a quantidade de Interações sociais entre eles. Os dados recolhidos foram comparados aos resultados esperados e verificados pela prova empírica. Durante esta fase, foi também feito um inquérito sobre a satisfação do jogador com a publicidade no jogo sobre se as técnicas como publicidade em vídeo, Product Placement e cartazes são bem recebidas pelos jogadores. Verificou-se que um aumento de ruído e distrações diminui a eficiência da publicidade no jogo e que as interações sociais têm um impacto muito negativo sobre a recordação e reconhecimento de anúncios no jogo. Isso pode trazer para os anunciantes uma visão importante sobre onde e quando incluir a sua mensagem de publicidade dentro de um jogo, bem como a forma de apresentar essas mensagens, porque a colocação de produtos em cartazes tem uma aprovação muito maior pelos jogadores.

Keywords

Video games, memory, recall, recognition, product placement, advertising

Summary

Studies have shown the effectiveness of product placement in general and how in-game advertising has evolved and how it compares to other media. With the evolution of technology and all the new ways to consume TV it's important for brands and advertisers to explore new ways to reach their target audience.

While video games exist as a media for many years, they are capable of communicate advertising with the same quality of other media due to the increase of computer power. Video games as a market is now also much more appealing to brands as it's another way to reach millions of consumers

This dissertation will explain the role of the room environment in the effectiveness of product placement in terms of recall and recognition in videogames. To answer this question, using the principles of recall and recognition as well as implicit and explicit memory, a study was elaborated where the participants were divided into four groups differing in terms of the noise and distractions present in the room as well as the amount of social interactions between them. The data collected was compared to the expected results and verified by the empirical proof. During this phase it was also made an inquiry on player's satisfaction with in-game advertising on whether techniques such as video advertising, product placement and billboards are well received by players.

It was found that an increase of noise and distractions lowers the efficiency of in-game advertising and that social interactions have a very negative impact on the recall and recognition of in-game ads. This can bring to advertisers an important insight on where and when to include their advertising message inside a game, as well as how to present this messages because product placement in billboards have a much higher approval by the players.

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1 - Introduction

Video games are no longer a hobby for a young crowd. They are played by everyone, everywhere at any time. The current younger generation due to the technological knowledge of their parents and their early contact with technology are able to familiar themselves with videogames at very early age. This recent behaviour is changing the time spent on TV or at least changing who is the dominant media, as players start to spend more time with other digital media instead of TV (Grunwald, 2003).

Social interactions are now made at least partially online and gamers tend to gather on the games they play together with their friends. These become almost like a second home to them when they are played for long time. Some World of Warcraft players probably know Azeroth better than they know some zones of their home town. Gamers are also more capable of multitasking due to how a video game usually works, hand coordination and gamer's attention usually scatters all around the screen with status bars, enemies and traps to account for. Most of gamers and younger generations in general have also become experts at searching for information, finding quick ways of looking for knowledge (Tapscott, 1998). This population has developed their reflexes and memory, but also has all the information it needs at the distance of a click. This facility also means this generation of gamers will not require much effort in learning controls for a new game.

Families are able to provide more devices. Instead of one TV for the entire family. In 1991 in Sweden 47% of homes could afford one TV. In 2009 61% can afford 3 or more (Carlsson, 2010). This fact contributed to a fragmentation of the audience. It's important now to advertise in more than one media, as a TV can miss gamers or those who consume TV content through services like Netflix or Hulu. Along with the increase of the number of TVs at home, it's also important to notice the increase in other technologies. We came from a recent past where more and more people owned a portable computer to a present where a large number of the population owns a portable computer, a smartphone and a tablet, all capable of being connected to the

internet as well as playing offline and online games. For example, in Portugal 38% of the population between the ages of 16 to 74 own a laptop and 48% a smartphone (INE, 2014).

Video games are a great new way of telling stories, capable of relaying a wide array of emotions with the same quality as movies or any other media. In the sports genre we now have an attention to detail and realism, that the increase in computer power made possible, that brings great potential to replicate what we can find in real life sports broadcasting and live events regarding advertising. Brands sponsoring great players can now think on more than what we see on TV, but also what we see on the computer models of that player, bringing a new dimension to product placement.

The history of product placement in videogames is not recent with titles from the first home consoles had already in-game advertising of real brands of some sort, but the way money flows has been changing in recent years. Before, it was game developers and publishers who had to approach brands and pay to have their products in their games, but now the reality is the completely opposite, brands pay to have their products on video games and sometimes even compete between themselves to have their product on the cover or any other stand out position (Kureshi & Sood, 2009).

Brands buying billboards space on stadiums may now also consider the possibility of buying a virtual one that will be viewed by millions of players as well. It all seems to depend on how we humans process information and how our brain recalls what we see. Interactivity may be a crucial factor to determine if these new forms of advertisement work the same on these two different media that on the surface have so much in common but are far apart in terms of exposition time and attention required.

If the possibility arises for advertisers to buy virtual spaces, it's important to see if these virtual environments are capable of bringing the same theoretical revenue to the clients as the ads and placements in other media. It's also important for brands that produce gaming products to understand how should they increase their brand awareness and use in-game advertising the

best way they can, mostly because it's the only advertising some of these brands spend money on.

1.1 – Objectives

The objective of this master's dissertation is to increase our understanding of advertising in video games, bringing a not very well studied variable to the equation, the room environment. With the help of an experiment this study will try to understand if the noise and other distracting factors can have any effect on recall and recognition of brands in the video game FIFA.

While understanding if the distractions and noise present in the room have any effect on recall and recognition, we will also bring new data to recall and recognition in product placement when used in video games. For this, first we will need to understand a variety of fields from memory, advertising and video games.

1.2 - Research question

The main focus of this study is to find out if and how does the room environment affect the recall of in-game advertising, while at the same time studying the overall effect on recall and recognition of this type of advertising. Taking into account the objective of this paper, the main question is the following.

RQ – Can the room environment affect recall and recognition of in-game advertising?

The following statements are hypotheses that will be proved or refuted by the statistical data collected during the study.

H1 – The amount of unaided recall of products/brands are above chance values.

H2 – In-game advertising has effects on implicit and explicit memory.

H3 – Recall and recognition of in-game advertising is affected by the environment of the room.

1.3 – Organization

This document is divided in four main areas. The introduction should give the reader an understanding of how video games evolved as a new media and a culture, as well as its impact on the relevance and importance of other media like TV in terms of advertising. The next chapter, theoretical background, will explain the main theoretical basic notions required to understand the later experimental data and conclusions. The theoretical background will mainly focus on advertising, explaining some of the techniques expected to be used on the traditional media and product placement, what is it and where it used. We will also explain some notions about how memory is divided between implicit and explicit, the differences and how to test each process on. This theoretical data will then be used on the next chapter, empirical study, where first we will explain the experimental phase, how it was developed and how different were each environment, and then present the collected data and what conclusions we can reach and how this impact the industry.

2 - Theoretical Background

In-game advertising is a reality for some time now, but it's still very far away from providing the same revenue as the TV and Film industry, however, the reality is changing and studies show the market is increasing and as the range of products that can be used interactively is growing, companies can start being more confident in using game's potential in advertising (Mackay, Ewing, Newton, & Windisch, 2009).

As the technology evolves, with graphics getting more realistic each passing year, as well as new forms of interaction with touch screen, motion controls and now virtual and augmented reality, games can now show very detailed and realistic models of cars and bikes, shoes and jerseys as well as cell phones and other accessories. In other media the viewer can usually only watch, but video games bring a new interactive element to advertising. Gamers can do more than watch the ad for a new phone, they can interact with it or simply dress their character the way they like with real products. The possibilities are huge and growing, and brands should be aware of them to reach a different audience.

The simple presence of the brand or product in movies, TV series or games has the potential to change the viewer/player opinion on the brand as well as just increase the brand awareness. Advergaming is an example of this attempt from brands to increase the recognition of the brand, and studies show that they increase the mental connection between brands, games and consumers (Wise, Bolls, Kim, Venkataraman, & Meyer, 2008). Advergaming is the term used to refer to games ordered by a big company with the purpose of advertising. One of the most known examples of advergaming was Pepsi Invaders, a simple Space Invaders clone that simply replaced the aliens with the word Pepsi. Studies also have shown that brands already known by the player tend to benefit the most from this type of advertising (Tina and Buckner, 2006).



Figure 1 – Pepsi Invaders ("Game Review: Atari Pepsi Invaders For Atari 2600")

The relationship between video games and advertising is growing as the media is evolving, just as the target audience is also becoming more demanding. In a way advertisers can't simply put their name out there.

Campaigns must be well thought with their audience in mind, an audience that is getting more and more diversified (Duarte, 2009). As explained in the first chapter, the current internet generation is more than capable of filtering information, so to stand out you have to have the right product and be original enough to stand out. In videogames this implies making good use of the interactivity element that can only be explored in this media. (Calvert, 2008).

2.1 – Video games

A video game is a game played in an electronic device, being it a computer, home console, portable console or smartphone. It evolves the interaction of a human player with an interface with feedback on a screen, being that the meaning of the Video on the name. The essence of a video game is not much different than a regular board game. Usually a video game is

a confrontation between two players on a virtual environment or a challenge for one player where he must solve puzzles and evade dangers.

The history of videogames is more than fifty years old, but it's popularization is more recent. The first Atari consoles and the first Nintendo Entertainment System paved the way for the wide array of consoles that followed. Something that started as a simple experiment in a lab and made its way to our living rooms with a console called the Odyssey (Figure 2), a very rudimentary game system that presented simple shapes on the TV screen, requiring a plastic sheet to be placed over the TV screen to change how a game was played. Since then the arcades reach popularity with games that were better than what was possible to players to have at home powered by specific hardware and died out when most of homes had home consoles and the hardware gap disappeared. Videogames changed from cartridges to CDs and from that to DVDs and Blue rays to nowadays where the trend indicates that games will one day be on the cloud.

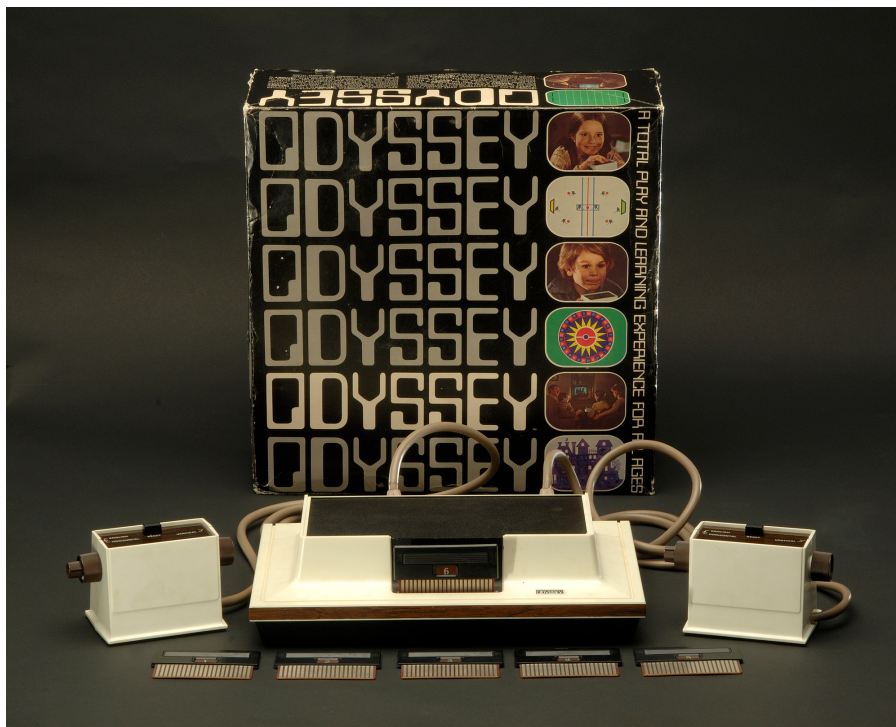


Figure 2 – Odyssey is credited as the first home console ("Magnavox Odyssey Video Game Unit, 1972", 2016)

Controllers became more comfortable and intuitive to play ditching the cords and incorporated motion mechanism to track the player. Players can now play with their bodies alone without requiring a controller, but the biggest change of all was how games look and how much attention to the detail is now possible. Retail games are nowadays cinematic experiences evolving well known Hollywood actors and directors well capable of telling great stories in an interactive environment.

All this evolution created an entire alternative culture with social media dedicated exclusively to video games, the simple idea of an online store for digital games like Steam evolved into an entire social network for gamers to connect and share their stories and discuss their favourite games or brag about their achievements on the games they have been playing. Events like BlizzCon bring thousands of fans together in an event that reach even more viewers with the sale of digital tickets. Video games have now also evolved into what is now called eSports, where gamers play against each other and where the top played games fill arenas on tournament finals and reach numbers higher than some sports on internet streaming.

Online gaming became a reality much later on the history of video games and only obtained the importance it has today when the PlayStation 3 and Xbox 360, home consoles from Sony and Microsoft respectively, integrated good and user friendly services on these consoles (Jakobsson, 2011). Online games are those taking advantage of the internet connectivity to connect at least two players on the same digital space, who can in some way interact with each other (Walkerdine, 2007). This social interaction created a new form of interaction between humans and is also the subject of many studies.

2.2 – Advertising

Advertising is an oral, written or multimedia message, sent to someone in particular or for the masses to achieve a specific goal. It's usually a form of mass communication that targets certain groups to achieve brand aware or captivate consumers towards a certain brand or product. Over the years it was

usually used in its simplest form, ranging from flyers, radio and TV advertisements or messages in magazines or newspapers. With the amount of messages, the population is nowadays exposed, other types of advertising have come forward as alternatives to the marketers. New possibilities for this industry now come in the form of sponsorships, companies can reach teams or athletes to wear their products or name their stadium with their brand's name for some time in order to gain exposure, or contact TV channel's producers to try to integrate their product in any form in their talk shows or similar shows in their programming. Other possibility is product placement. James Bond does not drive an Aston Martin for any narrative reason, he simply drives one because of the advertising contract the studio has made. Product placement is one of the most important topics of this paper and will be explained in more detail on the next chapters, as well as to why it is so important nowadays and in the field of in-game advertising. Other less known but also important techniques nowadays are Street-level promotions where a group of promoters will for example ask random passers-by to take a photo with them and a shiny slogan and then retweet some hashtag. Celebrity endorsements are also very important today. By having a well-known face bringing the message to the world can make a difference on whether a brand is known or not, and there are many examples where a single endorsement made sure a product achieved success. (Kotler, 2005)

2.2.1 - Traditional advertising

We can consider traditional advertising commercial messages delivered to the masses, usually in the form of outdoor billboards, television or radio commercials, ads in magazines and newspapers. This type of advertising is well studied and used by brands everyday (Dahlén, M., & Edenius, 2007). It can also be found in virtual spaces. Billboards are present in most sports games as well as in other genres, trailers and other promotional content is also present in some titles, usually on "freemium" games. This presence of video advertising on videogames is usually not very well accepted by gamers as it tends to break the normal flow of the games, taking the control away from the

player to show him a video he can't skip and that usually have no connection to the game he is playing. On other media has a better acceptance.

Studies have shown that the quality of the ad tends to change the perspective of the consumer on the quality of the product. When considering printed advertising for example, if the quality of the print is premium the ad has better result than when a cheap paper is used (Hampel, Heinrich and Campbell, 2012).

This type of advertising is so common and present in our everyday life that game developers tend to include them even in games where no real brands are present. The Grand Theft Auto game by Rockstar doesn't include real brands in any of its instalments. Food and car brands are all fictional but the game contains ads for all of them to increase realism. As the real world streets are populated with billboards, our radios broadcasts filled with commercial messages and our TV with long commercial breaks, so do games and movies try to recreate this reality as close as possible even when there are no real brands present to advertise. This phenomena could be related to the studies made on the the other forms of advertising, normally product placement, where these studies concluded that the presence of real world products on fictional worlds being them movies or videogames could improve the realism (Cobelens, 2009).

In terms of results there doesn't seem to be a correct answer, as studies tend to show good and bad results, depending on many variables such as the brand itself or the ad created. In Europe most football teams being them on the principal league or secondary, are sponsored. Some of these are sponsored by small business and while it's hard to determine the efficacy in terms on resulting sales of these sponsoring's, and even though this expenses com be tax deducted, most of the studies made have shown that these expenses would be better made on anything other than sponsoring a football team (Hansen Flemming, 1994).

The increase of use of social media websites as well as the improve of advertising algorithms allowed advertisers to be able to direct their budget to the right audience, shifting from traditional media such as TV or newspapers to

the internet (Hampel, Heinrich and Campbell, 2012). Recent studies show for instance that in the United States around seventy percent of college students report playing videogames (Moonhee Yang , David R. Roskos-Ewoldsen , Lucian Dinu, 2006). But a quick search for the player base of popular games like League of Legends or World of Warcraft can help giving us a perspective of how huge is the video games market (Kollar,2016).

2.2.2 - Traditional advertising in games

Video games can also be a way of conveying traditional advertising. Trailers for another games or movies can be presented in a traditional way, pop-in during loadings for instance, or act as a kind of product placement, like in a TV in the game world. Studies show that traditional advertising that interrupts the game is not well received in games, and players judge the game as a game of poor quality (Davidovici-nora, 2014), but it' Billboards can also be used in a direct link to reality. These can be static or dynamic, showing information relevant to the player's country or preferences. Billboards shown during televised football matches don't seem to have great recall, with the billboard with better results having only 17% recall (Hansen Flemming, 1994).

However, they seem to have better results in-game when well located. Sports games are one of the best examples of simulation. They emulate reality in almost every aspect possible, and billboards in tracks and arenas make the transition in this process, keeping most of the qualities and limitations they have on the real world. Due to the digital nature of video games, advertisers can target their audience with the help of the algorithms present in the market, retrieving information from their searching history for example to show them only relevant ads. In today's reality of mobile games, half of the developers used in-game advertising as a source of revenue, around the same percentage of those using in-game purchase of digital content and most of these used both sources of revenue, in a market that represented 600 million dollars in 2014 and is supposed to keep growing in the future (John Koetsier ,2014).

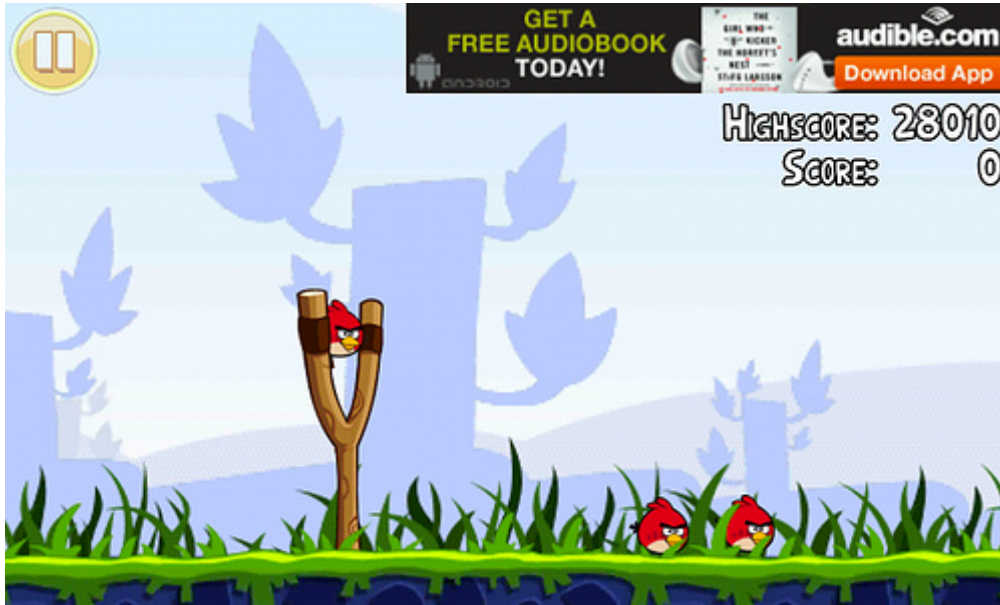


Figure 3 – Angry Bird's is a free game on Android with the revenue being provided by in-game ads

This type of traditional advertising on video games is usually present in games that run in the browser and mobile games, and is usually the main source of revenue, or works together with an in-game shop to provide the source of income for the developer. One of the best examples of this is Angry Birds, one of the most popular mobile games of all time and due to differences in markets and piracy presence, presented the players with two different versions. On iOS the game was paid, while on Android there was a free and a paid version. The free version had banners (Figure 3) and full screen advertising videos that stopped the game for a few seconds.

2.2.3 - Product Placement

Product placement is the presence of real brands and products inside of fictional worlds like TV shows, movies or videogames. It has been part of the advertising industry for many years with proven effectiveness. (Law & Braun, 2000), but as referred in the first chapter only in video game's recent history became a source of revenue for game developers. Studies have shown that

product placement does indeed have impact on brand visibility as well as on the buying preferences of the viewer (Law & Braun, 2000). The fragmentation of the audience, also introduced in the first chapter (Carlsson, 2010), in the recent years made it less predictable, making the job of targeting the right audience a little more difficult. The public that once gathered around the TV now has new ways of watching their favourite TV shows and spends more time with other devices (Carlsson, 2010).

Advertising on TV allowed publishers to reach almost everyone who watched TV in the past, but with the increase use of set top boxes, online broadcastings and streaming services, direct advertising can be ignored by the users, who can now skip commercial breaks or completely ignoring them when using services like Netflix or Hulu.

Marketers are also starting to have problems reaching the younger audience, who has shifted to the web and video games (Duarte, 2009). The main problem for marketers is the lack of know how in advertising in video games. Although it's a similar medium to TV and movies, there are differences in the audience as well as in the form the placement should be used.

Even when the placement takes place in the centre of the action with the protagonist in a popular TV show and during enough time, due to these services along with DVR technology it's not guaranteed it will have good results making TV increasingly not the best place to use product placement (Friendman, 2003). For example, Modern Family an ABC sitcom has been featuring Apple products at the centre of the actions on some of its episodes, one of which was shot entirely using Apple products (Figure 4).

Product placement has been used for years now, but this new characteristics of the market made it an increasingly more powerful tool for advertising. When the advertising product is inside the content being watched it also has the potential to create a more personal relation with the consumer. This was shown in recent studies as well as the importance of the quality the product placement is inserted in as well as the end result of this integration. If a product placement seems natural and well executed it will have the desired result, but the opposite can also happen (Lai-man & Wai-yee, 2008).

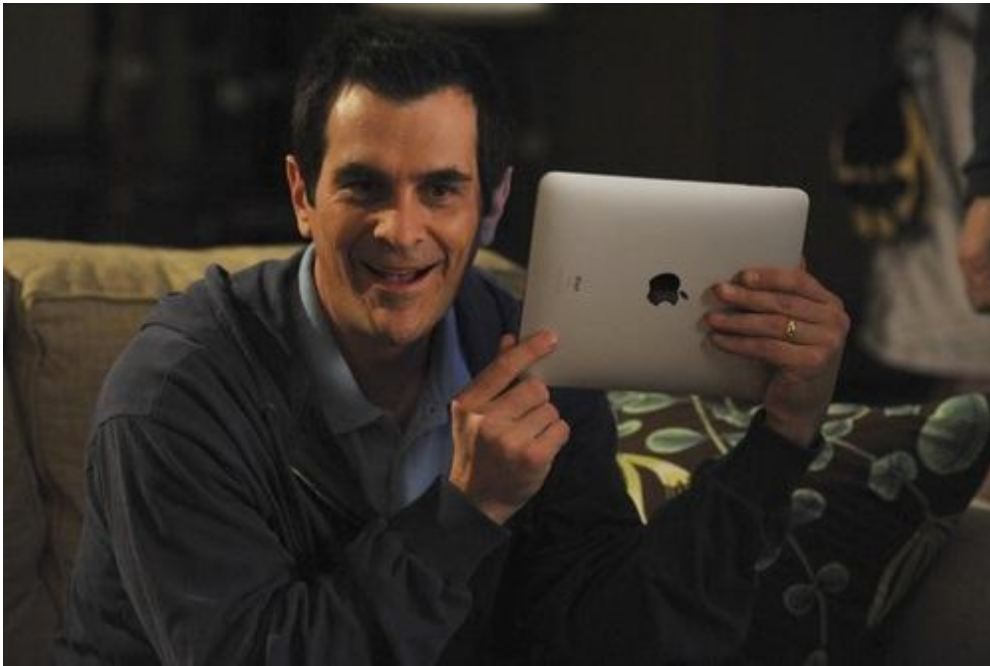


Figure 4 – Modern Family made heavy use of Apple Products (Image taken from episode Game changer - season 1 episode 19)

With the advances in the technology involving hardware used for gaming, videogames are now able to be a medium to show these kinds of advertising messages as well as TV Shows or Movies.

In a 2006 paper, Winkler and Buckner identified three types of product placement (Tina and Buckner, 2006), associative, demonstrative and illustrative. FIFA for example makes use of at least two of these. Associative placement is present when the brand of product appears in the background. This creates a natural atmosphere as logos of brands are expected to appear on the billboards in the background in the case of FIFA. Demonstrative placement is also present in FIFA and occurs when the players are shown wearing 3d models of shoes from Adidas or Nike, promoting the function as well as the brand. The third time of placement is not widely used in FIFA unless the FIFA brand is consider. In this type of placement, the brand is present in almost every element of the game, from the title to the shirts and every other element of the brand.

Videogames are also different from other media in terms of product placement to the exposition time. A movie is usually between one and half to three hours long, reaching more exposition with later visualisations, but a video

game easily reaches more than ten hours in a week by the player. Also, competitive gaming is what usually takes more time away for gamers. Along with the interactive aspect of videogames and the exposition time, these are the reason why video games are surpassing movies for longer (Nelson, Keum & Yaros, 2004). This with the studies that show that the second exposure to the product placement has better results seems to suggest that videogames should be a good media to integrate advertising content in the form product placement (Lehu, 2008). In this study the most tested placement type was the Associative, as it is present during the entirety of the match, contrary to the the brands present in the jerseys and shoes in each player that are unreadable when using the standard FIFA camera, and should be only recognizable to those familiar with the players or teams present in the match. Even though they are easily recognisable when someone scores, this would unbalance the variables as the scores were not the same in every match and more goals would result in a higher exposition.

2.2.4 - Product placement in video games

Product placement in games is a lot older than many gamers believe and in-game advertising goes back to the early stages of home consoles. Games like Coke Wins or Pepsi Invaders consisted of an entire game made to promote a brand. These types of games were never taken very seriously and it was with the evolution in computer power that was possible to use some of the techniques used in TV and Film.

Brands are taking video games more and more seriously nowadays and studies show that the results of product placement in video games tend to be very positive, with studies showing good result

With the quality of narrative driven games growing as well as their budget it's now possible to include cell phones or beverage brands in games the same way they are included in TV shows and movies. In the sports genre, product placement and billboard advertising have been a reality almost from the very start of the genre, or at least, since the time it was possible to incorporate these elements in a perceptible way. If we consider FIFA for

example and compare how close a shirt was to the reality in span of only 10 years, it's completely different.



Figure 5 – FIFA 15's Billboards show real brands when both teams belong to the Premier League

Even if product placement was being used before it was not as perceptible and could not have had the same impact on players. Shirts, shorts and shoes are recognisable in replays and in some cases even in the standard camera, billboards can advertise real brands, and brands and products are present in other places, as special items the player can buy, as upgrades for the Ultimate Team mode and more. The realism is reaching a level where haircuts and tattoos are replicated almost perfectly for the most known players like Ronaldo or Messi (Figure 5).

The main examples in terms of product placement have been the skate titles, mainly the Tony Hawk series with its big emphasis on avatar customization. Clothes, boards, wheels and other small parts were all customizable and levels were also filled with advertising in the form of billboards. Studies have shown that recall of brands and products when customizing and avatar, being it human, vehicle or anything else, is greater than anything else related to gameplay (Gonçalves, 2014).

Metal Gear 4 made heavy use of product placement, and even after being a little criticized about it, its use of Apple products and Playboy magazines are remembered, however little is known of how this impacted brand value and consumer purchases but the recall of the placement has endured the pass of time (Figure 6).

Also, the fact that companies have bidding wars to feature their cars as the main model of racing games must be a sign of the importance of this type of advertising. Racing games are one of the most important genres for product placement. Cars, parts and tracks all have a link to reality in games like Gran Turismo and it's really important for brands to ensure players create an emotional link to the brand or car model.

The same purpose was used when GM made their deal to feature their cars in the Transformers movie franchise. It's also important to remember the history of this relationship between car brands and game publishers and developers. Gran Turismo for example has been holding back on showing car damage using as explanation a request made by the manufacturer as they feared would damage their brand.

One thing is to see a car in action. In movies is normal for cars to show real brands and when not doing it, models are recognizable. But even there's an emotional connection to the brand and character, like James Bond to the Aston Martin, the viewer can only watch, while in game he can actually control the car. During the entire campaign of a game this car can go along with the player and the player can easily create an emotional connection to the car model, choosing it in subsequent games and can in some cases transcend the virtual world to affect his real life choice when picking a car as presented in some studies (Naughton, 2003).

The importance of in-game advertising is of great importance in today's gaming market as well as in-game purchases and the current trend of always online video games due to the problem of piracy. Due to the amount of pirated single player games present on torrent websites as well as the problem of second hand game stores, game producers and developers have to find new ways of finding revenue for their products. With video games achieving

numbers more and more impressive, with titles surpassing the box-office of some of the best movies of the decade and eSports reaching a number of viewers on their streams some sports have never reached and filling stadiums, brands start looking with other eyes to being present in a video game. More than gaining brand awareness, video games can help a brand just catch attention (Ghirvu, 2012).



Figure 6 – Metal Gear Solid IV’s use of Apple products

While product placement seems to have good results in movies and TV, it’s potential in virtual realities it still not very understudied. The similarities between the different media could indicate a good perspective for videogames as an advertising tool but the differences between videogames and other media can improve or diminish its efficacy.

2.2.5 - Traditional Advertising Versus Product Placement

Services like Netflix make TV commercials less and less attractive each year that passes, so product placement becomes one of the best ways to take

advertising from outside the shows to inside the content consumers actually want to see. Even with DVR (Digital Video Recorder) the consumer can skip a 5 minute commercial break, but can't ignore the products from inside the show, especially if they are even part of the plot. Studies have shown that 90% of viewers with digital recorders skip TV commercials (Soba & Aydin, 2013). Also, commercial breaks are intrusive and most consumers would gladly block most of traditional publicity. TVX reached the conclusion that the appearance of a Proctor and Gamble's toothpaste on the TV series "The Apprentice" was equivalent to 10.8 commercials (Saladino, 2008).

On the other hand product placement when used well can be less intrusive and give a sense of realism, connecting fiction and the real world of the viewers (Michelle R. Nelson, 2002). This same study also found a link between the results of the placement in terms of recall and recognition and the relevance of the brands or product to the player. When a brand was relevant to the player that increased his interests and in turn the results of recall and recognition. Contrary to traditional advertising it is also considered to be a more acceptable practice (DeLorme & Reid, 1999). When the products used are congruent with the viewers/players view of real life they produce positive cognition (DeLorme & Reid, 1999).

The general view in games is the same, with players noting that product placement and billboards can improve the realism of the game (Cobelens, 2009). Players also believe that in-game advertising can lead to more revenue to the game creators and in turn better games with better storylines and plots (Roer & Date, 2009). This only takes into account to point of view of the viewer/player, for the companies can be different. There's no guarantee that a movie or game will be successful and the use of a certain product will increase their sales (DeLorme & Reid, 1999). Actually, the execution seems to be the most important factor, even more important than the product itself (Lai-man & Wai-yee, 2008). It's important to note that even in perfect conditions, those who avoid publicity will still be hard to reach (Michelle R. Nelson, Keum, & Yaros, 2004).

But even without feeling natural, the final result is usually satisfactory. For the movie I, Robot, Audi created the Audi RSQ just as product placement without

any real model to promote, only with the objective of increase brand recognition and emotional appeal. Surveys show that the objective was more than achieved (AG, 2015).

Traditional advertising in football matches on the other hand seem to have a great impact on sales and good recall. Fans watching some matches on the field or at home will remember ads on the field and the team sponsors, but fans with season tickets and regular watchers of the games recall most of the advertising. A survey found that 88 per cent of Arsenal fans could remember the team's sponsor, JVC at the time (Bennet, 2006). But the same study concludes these numbers were only achieved after 14 years of sponsoring. So it's important to see the difference between real matches, usually less than 2 per week if we consider the public only watches one team, to around an hour of virtual gaming per day.

Brands have noticed the shift of the younger generation towards different media. As said previously the younger generation is shifting to other media or at least changing the way they consume traditional media contents such as TV.

It's also important to note that gamers have not yet shown signs of revolt against in-game advertising in general and no big campaigns existed to block this time of publicity. On the other hand opinions on sponsors in story oriented games seem to be negative, so companies should avoid it (Chambers, 2005). In-game billboards have shown better results, getting closer to the results found in fans viewing the games at the stadium, at least in the first-person shooters genre (Chaney, 2004). One of the main factors for this is the exposition time. While most fans watch a football match per week, they spend hours per day playing the same game.

2.3 – Memory

Memory can be simply described as the process of retaining information over time. It's also described as the ability to use our past experiences to determine our future path, but for the common individual is what allow us to communicate, work, remember the girlfriend's birthday or drive a bike. But all

these abilities require different kinds of memory, and those who study memory have divided it in two main processes that we will explain in detail in the next chapter, implicit and explicit memory (Matlin, 2013), the two main components of our long-term memory.

2.3.1 – Implicit and Explicit Memory

To better understand how to improve in-game advertising and advertising techniques in general, it's important to understand the concepts of implicit and explicit memory. Implicit memory can't be consciously recalled, it reflects our experience and contains all the actions we perform without having to remember how to do, being the classic example remembering how to ride a bike. It's the thing we do without thinking. On the other hand, we remember every time we fall off the bike, these we can remember when and how and belong on the realm of the explicit memory. This memory is about what we did yesterday or the day before (Figure 7).

Implicit memory has two main categories or effects. First is priming, which is the ability we have to remember something after the presence of a stimuli. If a person is asked given partial information, like a partial image of a brand, if he was exposed enough he will remember the rest of the information from this fragment. This is one of the available techniques we have to test recognition. The other characteristic of implicit memory is the procedural memory. Procedural memory allows us to perform certain task without consciously thinking about it. The perfect example of this is riding a bike, it's why we say that when something we do is almost impossible to forget "it's like riding a bicycle", but in our case, in this study, it's the simple memory of a controller. A regular player has more difficulty to remember where the buttons are or what they do if asked than by performing the actions. This is the process of implicit memory.

Explicit Memory is also divided in two main components, episodic and semantic. Episodic as the name implies allow us to remember certain episodes of our life and other elements of our environment. In the case of advertising it's the memory we would try to access when asking someone to remember

certain brands present in a video or game a subject has just played. As we are trying to make him remember details of a very specific event. The other component of explicit memory is our semantic memory. This is not responsible for remembering certain event but it's what we commonly call knowledge. It's mostly what is required in school, allowing us to remember concepts and ideas. While episodic memory remembers the time we passed playing a certain game, semantic memory allow us to know what a video game is (Nicolas & Marchal, 1998).

In terms of advertising these types of memory are explored differently, usually when the marketer is looking to create an emotional response or not from the ad he is creating (Czellar & Luna, 2010).

Being emotional connected to a product or brand is what a lot of companies try to achieve and in videogames can be hard to achieve. Loving a brand without remembering why is the result of a good campaign affecting the implicit memory of a subject that can't recall the factor that made with love the brand so much.

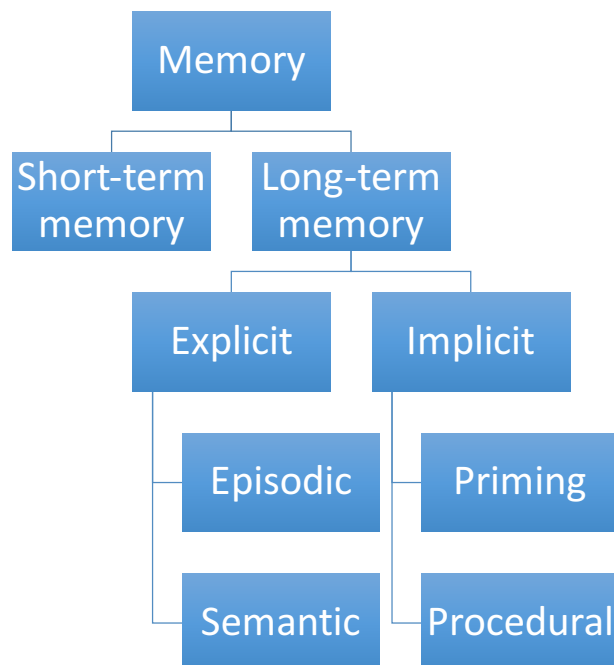


Figure 7 – Types of memory (Matlin, 2013)

Studies show that even when we are not aware at a conscious level we are registering information almost as well as at a subconscious level, and that

can be even better for marketers. The same studies show that we remember this type of information in terms of advertising we tend to insert these products or brands in a good category (Glass, 2007).

Studies on the effects of advertising on low attention viewers concluded that the true effect of advertising is unknown to the viewers and ads can impact the viewers choices and opinions even without paying much attention to them, so it's important to review systems used in market research to reflect this (Heath & Nairn, 2005).

This same study also concluded that Recall is a good metric when studying recall, recommending recognition and periodic testing as more efficient method to test the effectiveness of product placement. This effect of advertising with low attention is important to study the effects of advertising in videogames due to the intensity of the matches in games like FIFA or the speed of games like Gran Turismo or Need for Speed where the information can pass the player by in seconds.

While it's more important in these games, most games require the player to share its attention between various task. Being multimedia is one of the responsible factors of the popularity of videogames, and as these different components join forces, the players share their attention on story, gameplay, video and audio. In the sports genre we take story away, but this is replaced by the intensity of the match and the increase in focus required in a competitive match. Most billboards in these types of games when present will be seen for very little time and not as the main focus of attention unless it's an exploration based game and the ad stands out and pulls the player's attention.

2.3.2 – Recall and Recognition

Recall and recognition are both important measures when analysing this subject. Studies from the TV show Seinfeld showed that even though products that are talked about have bigger recall and recognition they do not always reflect well on sales increase, and products only shown briefly still show good results in the recall and recognition tests (Law & Braun, 2000).

Because of this, it's important to study the different impact in-game advertising has on implicit and explicit memory. This is also important to understand how the intensity of the game impacts the recall. One other aspect is the presence of a friend playing or the multiplayer environment. Studies have shown that a more social gaming session and the presence of another friendly player actually increases the recall of brands and products (Dardis & Schmierbach, 2012).

Studies show that brand and product placement in games is being processed by players and it's implicit memory is being influenced by this placements (Yang & Roskos-Ewoldsen & Dinu , 2006). As one said before, the most important test in product placement is that the viewer does not notice the placement but remembers it (Williams & Petrosky, 2011). Contrary to traditional advertising, when companies try to achieve an emotional response from a product placement, the response in the end might not be the result of the product in question but the content the product placement is used on. It's mainly the quality of the content that will result in an emotional response in the consumer and not the product itself.

2.3.3 – The effect of advertising in memory

The primary focus of advertising is to increase the visibility of a brand or product. Brands want consumers to associate a necessity or desire with their brand. The objective is to when a consumer goes to buy a product he is more inclined to buy a certain brand. This could come from personal preference or simply because for some unconscious reason, this consumer prefers one brand over the other (Moonhee Yang , David R. Roskos-Ewoldsen , Lucian Dinu, 2006).

Product placement is a different technique to achieve the same thing. Studies never gave total support to the idea that this technique works . Some studies showed great results while other shown little to none recall of the brands involved in the placement. Studies also have shown that while product

placement show low effect in memory for some brands, other brands benefit more more from it (Ong,1994).

Other studies shown that gamers in First Person Shooters recalled passing by billboards during their playing session but had little memory of any of the brands, products or even the category of the product present in the billboard (Hsun & Ling & Ting ,2004). But to reinforce the mixed results in this field of studies, other study showed that players tended to remember brands when they were present on billboards but not when they were present in the gaming world, except if the product placement was a car (Grigorovici & Constantin, 2004). When exploring a virtual location and a billboard was present the brand was recalled, but if for example a can of a beverage of the same brand was present it was usually ignored.

3– Empirical Study

This chapter will explain how the experimental phase was prepared and implemented and how the previous notions helped interpreted the data collected, presenting the possible conclusions and how this can help the video games industry improve its revenue in terms of in-game advertising. The concepts of product placement, video games, implicit and explicit memory provided the crucial information that was required to create a set of questions responsible to test the subjects in terms of recall and recognition that will be explained in this chapter.

3.1 – Preparation

The game chosen for the experiment was FIFA 15. The FIFA franchise is a long running EA Sports series that not only is popular and has a very large player base, it's also responsible for showing how a football video game should play like, leading the way in terms of sales and reviewer's acclaim ("Metacritic FIFA 15"). Using FIFA in our experimental is also important because as a simulator it allow us to understand how reality and video games compare to one another in terms of advertisement recall and recognition. As games in general approach levels of realism closer to the reality, the main difference between a passive visualization and the active playing of a game is interaction how it affects our memory processing.

Before starting the experimental phase, it was necessary to create a series of questions to test the subject's recall and recognition of the in-game ads. Our first set of questions mainly collected personal data, like age and gender. The second group was made to test the subject's gaming habits as well as his knowledge of real life football, as it would have direct impact on the results. No knowledge of football would lead to no previous knowledge of some of the brands present, and too much would lead to not even needing the stimuli from the game to recognise the brands. The third block of questions was where the user gave us our results for recall. Without any aid, the player

just had to write all the names of the brands he recalled. The fourth and fifth were meant to test his recognition.

The fourth block of questions tested his recognition in visual terms. A series of partial images was presented to him and he to choose which ones were present on the game he had just played. All brands are present in FIFA, but only five were present in the games billboards. Because sports brands are expected to be present all main sponsors were present as options. This allowed us to test if we were above or below chance values. The fifth block of questions also tested recognition but on text. All the same brands were present but in the form of text. Also present were some question about the player opinion of in-game advertising in the form of game breaking video ads, billboards or product placement.

3.2 - Methodology

To answer the research questions proposed above, the methodology must be the experimental approach.

“The experimental research approach is a quantitative approach designed to discover the effects of presumed causes” (Christensen, 2003). By maintaining some of the variables as stable as possible, in this case mainly the football knowledge and gaming habits, at least on FIFA, by tempering with the environment alone should be possible by an experimental approach to see how this variable, in this case the environment has any effect on our other variables, recall and recognition (Bilgihan, Cobanoglu, Nusair, Okumus, & Bujisic, 2013).

3.2.1 – Measurement

The experiment was made to measure recall and recognition on different environments. Recall was tested by asking the subjects to remember what brands did they remember from the game they had just played. This would allow us to in the test the effect of product placement in FIFA on implicit memory.

Recognition was divided in two different tests, one more visual than the other. One of the tests was made using partial images of the brands present in the game and subjects had to remember which ones were present in the match he played, and the other used the same brands but in text form and the subjects had the complete name of the brands to pick the ones present in the match. This was made to test implicit memory and the effect the in-game advertising had on it.

3.3 – Environments and material

The main focus of the experiment was to test our subjects in four different environments, with each one having different levels of noise and distractions to test how attention affected recall and recognition. Another important variable added was the social interactions in one of the groups.

The experiment consisted of one ten-minute match between two of the subjects. The only requirement made to the subjects in terms of previous experience was some previous experience with the game. Subjects had to have played the game before at least once. This allowed us to gather results not affected by game controls inexperience and have our users focused on the game being played. In terms of the game requirements, users were asked to play with Premier League teams, due to the game's licensing limitations, where only teams from this league have ads during the matches.

After the ten-minute match users were taken away from the game and answered questions isolated in environments one, two and four, and in groups on environment three. This questionnaire was divided in five sections. The first one consisted on the user's personal information like gender and age, his previous experience with in-game ads and sports games and sports in general. The second part tested his recall of the match he had just played and how many of the brands present in the game he could remember and where were they positioned. The third section tested user's recognition of the brands present in the match.

The subjects had to select from a list of partial images the ones present in the match they had just played. The fourth section tested the same thing but

with only the brand's names. Subject had to select from a list with the exactly same list as before the brands present in the match, but this time with the brands names instead of partial images. We called these text and image recognition. The last section was about the subject's opinion on in-game advertising. Subjects could leave their opinion on video ads, billboards and product placement as well as an open answer to say anything else they wanted to add on the subject.

The main variable on this experiment was the differences in the environments. The main focus on choosing these environments was the attention these environments should allow our subjects to have on the game, but also how different they should be from their normal gaming routine. We imagined our average FIFA player to play at their own home alone or at best with one other player (Jones, S,2006) This way the first environment was chosen as an extreme case where users should feel completely different from their normal gaming environment.

3.3.1 – Environment 1

The experiment on environment one was made during the event Central Comics Fest 2015 ("Central Comics Fest 2015 – 1 E 2 De Agosto"), a pop culture event similar to Comic Con on a smaller scale, with activities based on cinema, videogames, comic books, Japanese animation and cosplay. It lasted the entirety of the two days of this event and around 200 people roamed the corridors daily. Subjects played against other human players and answered the questions alone but with the same level of noise, but in an environment with less visual distractions as they were taken to a different zone to answer the questionnaire.

The noise level resembled a shopping mall with the subjects often keeping side conversations with friends. In terms of comfort the setup used was no different than what we could find at a normal home, a 32" TV and the game running on a PlayStation 4 with users playing on a couch at a 2 meters' distance from the TV. This setup carried over to the environments two and three (Figure 8).



Figure 8 – Environment 1 setup

These are the conditions of the first environment, consisting of the example in this study of a low attention environment with a high amount of distractions.

3.3.2 – Environment 2

Environment 2 was chosen as an intermediate attention level. This experiment was made during a hockey training where the subjects would come to a different room to play in pairs. The only persons present in the room were the subjects and the observer and after the match they were separated to answer the questions.

The noise level was moderate and came mainly from the hockey training with players shouting and the normal noise from a hockey match. The door was closed so the environment was not quiet but it was considerably quieter than the environment one. The facility was a sports arena from a local organization where kids learn a variety of sports. Because the results of this experiment can differ if the subjects have a large knowledge of football teams,

the hockey practice was chosen instead of indoor football (Figure 9). These conditions make the second environment an environment of medium attention with moderate amount of distractions and noise.



Figure 9 – Environment 2 setup

3.3.3 – Environment 3

For the third environment a different approach was taken. This was not chosen for its noise levels but for its social interference. Attention should not only come from the noise and movement around but also from the presence and direct influence of others around not only during the game. This environment could help understand if the subject's memory and choices could be altered by the presence of other subjects during the game and questionnaire. The subject played in a room none of them knew but with the same setup as before. Subjects didn't have much time to discuss what were the right answers but they were allowed to dialog when answering the questions (Figure 10).

This environment put players closer to the conditions that are met during the time they regularly play games. The only two participants during

each session was the interviewer and the subject of the subject. The third environment has almost the same characteristics as the second one with the only difference being the increased social interactions on the playing phase as well as on the answering phase.



Figure 10 – Environment 3 setup

3.3.4 – Environment 4

The last environment is the control environment. Users played in their own home against the observer and were interviewed alone. No relevant noise, visual stimuli or any other noticeable distractions were present. Compared to the other environments this was the only one with variable setup as users played in their own TV but like on the other environments on a PlayStation 4. If the screen size was noticeable different from previous sessions it was used the same setup as with other environments to maintain these variables equal to all participants.

This environment is the one closest to the real environment console and computer video games are usually played. Mobile gaming is a reality completely different and much more unpredictable as players can play anywhere, but on this case this is what better represents the common gaming

environment. This is a high attention environment. Very little noise to none was present and no distractions could be identified.

3.4 – Process

The experiment resulted in forty-eight subjects, divided unevenly between the four environments. The first environment had seventeen subjects and the fourth eleven, while the second and third environments had ten each. Of all the results forty-seven were males and one was a female. Ages ranged between 12 and 45 with an average age of 18.9 (σ : 6.61) . Most of the sample were students and all were used to play video games on average 9 hours per week and had played FIFA before. They also had some knowledge of real life football, watching on average less than 2 matches per week. Taking this into account, further tests were made with variables weighted. As can be seen in Table 1 and Table 2 below, the best results came from the tests with the recognition of text and environment 4 shows the best results overall.

Table 1 – Average of right answers in all environments

	Environment 1	Environment 2	Environment 3	Environment 4
Recall	0,4	0,6	0,4	1,4
Recognition (images)	0,6	1,6	0,5	1,3
Recognition (text)	0,8	2.1	0,5	2,1

From Table 1 we can on first glimpse clearly see the poor results of environment 3 and the general increase in performance on recall as the noise diminishes as well as the test shifts from recall to text recognition.

Table 2 – Average of wrong answers in all environments

	Environment 1	Environment 2	Environment 3	Environment 4
Recall	0,1	1,0	0,2	0,4
Recognition (images)	1,2	1,6	0,7	1,0
Recognition (text)	1,2	2,4	1,3	1,8

The worst results came from both the first and third environments. This corresponds partially to the expected result. While the first environment due to the amount of noise and distractions was expected to have bad results in terms of both recall and recognition and the fourth environment the best results, the third environment came as surprise. The social element affected the results and made two similar environments, two and three, have completely different results. While the amount of noise and distractions was similar in these two different environments, the presence of other subjects and the fact the test was made in group affected their results.

One way to interpret these results is the influence of the other subjects on influencing their opinion. In more than one occasion subject were talking while answering the questions and one of them appeared to know the correct answer but gave an incorrect one influenced by another subject. While answering alone, some of the subjects also had some problems giving answers to something they clearly saw during their playing session.

In one of the sessions on environment 1, one of the subjects commented on the Samsung and Barclays brands but failed to remember them on both recall and recognition tests, only remembering after the test when it was brought to its attention. This kind of behaviour happened one more times on environment 1 and another on environment 2 with the same brands. This indicates that on the moment the player is in direct contact with

the game he clearly noticed the advertising, but the ad lacks the ability to leave a more lasting memory on the player in these cases.

Table 3 – Percentage of Right Answers

		Recall	Recognition (images)	Recognition (text)
Environment 1	Right Answers	7	10	14
	Possible Right Answers	68	40	40
	% of right answers	10%	25%	35%
Environment 2	Right Answers	6	16	21
	Possible Right Answers	68	40	40
	% of right answers	9%	40%	53%
Environment 3	Right Answers	4	5	6
	Possible Right Answers	68	40	40
	% of right answers	6%	13%	15%
Environment 4	Right Answers	15	14	23
	Possible Right Answers	68	40	40
	% of right answers	22%	35%	58%

Results for Recognition are overall better than results of Recall, as it was expected from the literature review, and text recognition shows slightly better results as seen in Table 3 above. Taking only the amount of noise and distractions into consideration we can see that in terms of Recall results are similar between environment 1 and 2 and improve on environment 4 and Recognition slightly increases when noise levels are lower.

Table 4 – Kruskal-Wallis Test for Recall

Ranks

	Environment	N	Mean Rank
percent	1	17	19,00
	2	10	43,50
	3	10	5,50
	4	11	33,00
	Total	48	

($H(3)=47,0$, $p<0,001$)

These results are corroborated by the empirical proof. To achieve this, the data for the right answers was tested for significance using the Kruskal-Wallis test. The Kruskal-Wallis test is a nonparametric test used to test significant differences on a dependent variable by a grouping independent variable. While not as powerful as the ANOVA, it's recommended for smaller samples like the one collected on this study. The values contained on Table 4, 5 and 6 with the significant value prove H3 that there is a relationship between the changes of the environment and the recall and recognition both in the form of text and images.

Table 5 – Kruskal-Wallis Test for Image Recognition

Ranks

	Environment	N	Mean Rank
percent	1	17	29,00
	2	10	15,50
	3	10	5,50
	4	11	43,00
	Total	48	

($H(3)=47,0$, $p<0,001$)

As shown in Figures 12, 13 and 14 due to the values of the Mean Rank we can conclude there is a significant difference between the environments. Because of the nature of the Kruskal-Wallis test, this does not however tell us where or how these differences exist, but analysing the data provided by the other graphics we can reach conclusions. The main difference between all the results gathered was the environment and the results of this test tell us there is a link between the environment and the values collected for the recall and recognition. Most of the results are below chance value, so it is possible that subjects guessed some of the brands present and thus it's not possible to accept H1. But we can accept H2 because the tests of text recognition are above chance value and have impacted the memory of at least a sample of the subjects.

Environment 3 showed the worst results in all tests. Taking into account that the main difference between this environment and the others is the social factor we can conclude that the presence of others has a negative effect on both implicit and explicit memory. This in the end means that advertising in video games that are played in a social environment, such as party games like the Singstar series or motion control games such as the sports games for the PlayStation move or Kinect, should be avoided.

Table 6 – Kruskal-Wallis Test for Text Recognition

Ranks

	Environment	N	Mean Rank
percent	1	17	19,00
	2	10	32,50
	3	10	5,50
	4	11	43,00
	Total	48	

($H(3)=47,0$, $p<0,001$)

Of course more studies are needed to further understand what element of the social environment had the most influence in this results. If it was the social environment on itself, lowering the attention, or has it was already explained earlier, the presence of someone who influence the test results by distorting the memory of the other subjects.

Table 7 – Opinion of the participants towards different types of advertising

Type of advertising	Average (1 - 10)
Video Ads	4,2 (σ: 3.2)
Billboards	7,9 (σ: 2.4)
Product placement	8,1 (σ: 2.5)

The opinion of the subjects towards in-game advertising was overall positive, as shown on Table 7. The values were gathered from measuring the distances on a 1 to 10 value scale. In terms of video games, they didn't show adversity towards the idea of in-game advertising. In terms of video ads, they had the most negative opinion, mostly blaming the fact that gameplay was halted for the period of the video. Some of the subjects showed a positive attitude towards this practice as in the past they had downloaded some games because of an in-game trailer.

Billboards and product placement had a much better acceptance by the players. The average rating on the opinion the subjects had was around 8 out of 10 on both billboards and product placement. Most of the subjects said this was a better solution to insert advertising on video games. While discussing the subject they said that billboards made the games more realistic and while most didn't bother or had a good opinion of the presence of products or brands from the real world on video games, some of the subjects referred the importance of the relevance of the product on the game. On sports games was already expected and subjects said it made the games more real, on other genres could be a distraction from the plot.

The questionnaire ended with two questions, one about the possibility of product placement to increase realism and the other about the influence of in-game advertising on purchasing choices. Almost 98% answered that product placement increased the realism of the game. In term of being influenced to buy or download a product based on an in-game ad the answers were divided, with almost 47% admitting to having been influenced or know someone who was influenced to purchase or download a product because of an in-game advertising.

3.5 – Discussion

The results collected in the experiment show mainly results below chance value. This could be an indicator of the low impact on a simple match. Even if we consider the limitations of the questionnaire and for example the ratio between right and wrong answers, this does not explain the results received from the recall tests. On recall only 1 out of 10 answers was a right answer. Given that the results from other studies seems to give very good or very poor results to this type of advertising, this study shows similar results to other studies who have shown the poor results in terms of recall of product placement in general.

A probable cause of some of the poor results obtained could be the lack of familiarity of the subject of some of the brands. Subjects could choose the team they wanted and some chose teams who had sponsors not well known to the Portuguese public. A detailed look on the most common brands answered shows that the sports brands along with Samsung and Barclays are the most common answers. Brands like Standard Chartered are mostly unknown to the common player and that can have a negative effect on the subject's recall and even recognition.

The fact the subject knew they were taking part in a study even if they didn't know what the study was about can also increase stress levels and diminish the effect of the product placement. Some of the younger subjects were clearly nervous.

But these are only possible explanations for the poor results obtained. The fact is that a 10-minute match of a high intensity game like FIFA can indeed have poor results of recall and recognition. Also the main variable tested, the environment, indeed had significant impact on these variables. We have to look at the results of the average number of right and wrong answers between all environments, as well as the percentage of right answers between all participants, and when we do we can conclude that the environment had a direct impact on recall and a lower impact on recognition. In terms of recall the research question has been answered.

The level of noise and other distractions have showed to have a negative effect on recall and the ability of the players to remember the brands present with the percentage of correct answers going from 10% to a 22% in respectively noisy environments to quiet ones, with a medium noise environment reaching a result almost similar to the noisy one.

While with these results, it can be difficult to prove if in-game advertising has impact on most of the subject's memory, the differences between environments do show that the noise and distractions of the environment and social interactions have a negative effect on the player's ability to recall in-game advertising, when the amount of noise reach a certain level. With low to medium amount of distractions and noises the results were similar specially in terms of recognition. Recognition is much more susceptible to be conditioned by previous memories and the results above chance of the fourth environment show that even in a test with many more wrong than right answers the subjects made a good job of recognising the right answers.

3.6 – Impact

The conclusions of this study mean for the marketer and brands that in-game advertising has good results, specially in terms of recognition and if certain conditions are met. Party games probably will have bad results trusting the data collected from environment 3. This conclusion in specific should be studied further with more variables to understand what elements made a social heavy environment have such bad results. In terms of recall, when users play in

their own home results were better reaching 22% of right answers across all subjects. This means that single player games targeted for a long sitting play session should show the best results, Overall, when noise levels were lower and the environment had less distractions recall and recognition was better which means marketers should target video games that require the player to be concentrated on the game.

While results are good they are not revolutionary and do not show indication of in-game advertising having much of a difference from other types of advertising. While brands that want to target this demographic should consider this type of advertising, marketers shouldn't leave their other options. They should study this different market and create new ways to use the interactive element to increase the awareness of the public of their brand and products. While some brands should use in-game advertising as complement for their other publicity messages, brands in the gaming business like gaming keyboards and mouse's, should really embrace in-game advertising not only as they are currently doing, but study new ways of use interactivity. Brands mostly can't show the quality of their product on an ad, and in the case of video games, they should use it to increase brand awareness and connect to an audience that is moving to other media.

Video games evolve faster than most other media does, graphics have changed so much on the last 20 years that in the future a new generation of photorealistic games can really make the task of telling if an image is taken from the real world or a game almost impossible, and new technology emerges every day, with new Virtual Reality headsets coming out and Augmented Reality becoming better and better, brands should study now to create new advertising techniques that work in this media so they can be the first when new technology arrives.

3.7 – Limitations

The results of this study should also be seen only as a starting point in studying the impact of the room environment on recall and recognition of brands on in-game advertising. The number of participants on ideal conditions

should be higher, in this case we had 47 participants, a number that allowed us to reach some conclusion but left us with similar results on some environments and didn't allow us to study other variables as sex and age, or other genres of games. It's important that future studies at least test these results against similar ones on different genres, mainly exploration games like Grand Theft Auto and games with heavy social elements to better understand the results this study presents on the third environment.

If possible would be also interesting to have a wider variety of environments and test the social element on online games to test if the human presence influences the results even if it's not a real presence but only a virtual one. On this test it was impossible to differentiate between the knowledge acquired during the match or at least from FIFA and the one that was gathered outside the game. Sponsors are the same as the real world and most of the brands were well known. The subjects iterated around the same 5 or 6 teams that are better known and a closer analysis at the brands that were recognized shows us that most of the correct answers came from the most known brands such as the sports brands Nike or Adidas as well as Samsung or Barclays. Studies conducted on optimization of commercial breaks and the commercials themselves have shown that this results of recall and recognition can be improved using only optimization (Teixeira, Wedel & Pieters, 2008).

Further studies could try to study if these results are mostly because of these brands made an overall better job at creating brand awareness on the population or what are the reasons to be better recognizable.

Studies have now shown how most media impact brand awareness, but it's important to create new techniques to improve these results and create new ads that perform well on each media. Video games can use the same types of advertising as movies or TV but while they are shown to have similar results, it's important to develop content that makes better use of the strengths video games have as media.

Conclusion

The data collected and proven by the empirical proof from the Kruskal Wallis test leads to the conclusion that environment has indeed impact on the recall and recognition of brands on in-game advertising. When considering noise and distractions environment 1 had the greatest number of disturbing elements, followed by environments 2 and 3 on equal terms and environment 4 at the end with the calmest environment and this correspond to the results gathered. Environment 4 had the better overall results and environment 3 the worst, but the results gathered also show that medium and low amounts of noise and distractions have similar results at least in terms of recognition.

Considering that environment 3 had an increase of social interactions during the duration of the experiment we can conclude that social interactions have a negative impact on recall and recognition of the brands present in-game. With the data collected from the survey, there's a negative opinion of in-game video ads when they stop gameplay and a positive opinion of product placement and billboards with players having the opinion these advertising techniques improve the feel of realism of the games.

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Attachments

Questionnaire

Gender:

M F

Age:

Occupation:

Student Other

PART I

1. Do you regularly play videogames?

Yes No

2. How many hours per week?

Yes No

3. Do you recall any in-game ads and product placement?

Yes No

4. If you do, can you list games and products you remember?

5. Have you played sports games before?

Yes No

6. Have you played any FIFA title before?

Yes No

7. Do you remember any brands or products from the match you just played?

Yes No

8. If you answered yes, what brands and products do you remember seeing in the game you just played?

PART II

9. Circle the brands you recall seeing in the game.



Pnc	Cranswick	Hankook	Nissan	Qatar Airways	MKM
Gazprom	StubHub	Champions League	Neil Hudgell Solicitors	veho	Eterna
PlayStation	Nike	Etihad	UEFA	Western Union	Barclays
Samsung	Fedcom	UniCredit	12BET	Aon	Mastercard
Umbro	Warrior	Puma	Kingspan	Adidas	Europa League
Htc one	Fly Emirates	Chevrolet	Sprite	AIA	UnderArmor

10. What's your opinion about in-game advertising?

Video ads

Negative-----Positive

Billboards

Negative-----Positive

Product placement

Negative-----Positive

11. Do you believe product placement adds realism to the game?

Yes No

12. Have in-game advertising affected your buying decision?

Yes No

13. Do you have anything else to say about this subject?

Detailed results

This chapter will present all the raw data that was gathered and used in this study. Tables that were based on this data can be found on the pages above and are not present here.

Full results grid

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

GENERAL QUESTIONS									
Environment	1	1	1	1	1	1	1	1	1
Sex	M	M	M	M	M	M	M	M	M
Age	20	24	25	25	25	31	38	23	22
Occupation	Student	Other	Student	Other	Student	Other	Other	Other	Student
Playing time per week	28	12	8	14	10	0	5	13	4
Recalls in-game ads	N	N	Y (1)	N	N	Y(2)	N	N	N
Football matches watched per week	2	2	0	0	0	4	10	10	0
RECALL									
Remembers brands or products	Y	N	N	N	N	N	N	Y	N
Right answers	3	0	0	0	0	0	0	0	0
Wrong Answers	0	0	0	0	0	0	0	2	0
VISUAL RECOGNITION									
Right answers	2	2	0	0	0	0	2	0	0
Wrong Answers	3	11	0	0	0	0	1	3	0
WRITTEN RECOGNITION									
Right answers	4	3	0	0	0	0	2	1	0
Wrong Answers	1	17	0	0	0	1	0	1	0
OPINION									
Video Adds	3	1	5	1	7	8	8	10	10
Billboards	5	1	5	5	7	9	8	10	10
Product placement	10	1	10	5	3	8	8	10	10
PP Ads realism to the game?	Y	N	Y	Y	Y	Y	Y	Y	Y
Have you been affected by in-game ads	Y	Y	Y	Y	N	N	N	Y	N

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

GENERAL QUESTIONS									
Environment	1	1	1	1	1	1	1	1	2
Sex	M	M	M	M	F	M	M	M	M
Age	23	21	45	22	23	28	25	19	16
Occupation	Student	Other	Other	Other	Student	Other	Student	Student	Student
Playing time per week	5	21	0	10	12	10	10	20	4
Recalls in-game ads	N	N	N	N	N	N	Y (2)	N	N
Football matches watched per week	0	0	0	0	0	0	2	2	3
RECALL									
Remembers brands or products	N	N	N	Y	N	Y	Y	Y	Y
Right answers	0	0	0	1	0	1	1	1	1
Wrong Answers	0	0	0	0	0	0	0	0	2
VISUAL RECOGNITION									
Right answers	0	1	0	1	0	0	0	2	1
Wrong Answers	1	0	0	0	0	1	0	1	2
WRITTEN RECOGNITION									
Right answers	0	1	0	1	0	1	1	0	2
Wrong Answers	0	0	0	0	0	0	0	0	3
OPINION									
Video Adds	4	10	1	1	5	3	1	2	1
Billboards	6	10	10	5	5	10	10	7	9
Product placement	5	10	10	5	5	6	5	6	9
PP Ads realism to the game?	Y	Y	Y	N	Y	Y	Y	Y	Y
Have you been affected by in-game ads	N	N	N	N	N	N	N	N	Y

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

GENERAL QUESTIONS									
Environment	2	2	2	2	2	2	2	2	2
Sex	M	M	M	M	M	M	M	M	M
Age	15	14	13	16	17	13	13	16	13
Occupation	Student	Student	Student	Student	Student	Student	Student	Student	Student
Playing time per week	4	9	4	7	14	7	7	0	4
Recalls in-game ads	N	Y(2,3)	N	Y(2)	Y(2)	N	Y(2)	Y(2)	Y(2)
Football matches watched per week	3	4	2	1	1	3	2	0	2
RECALL									
Remembers brands or products	Y	Y	Y	Y	Y	N	N	Y	Y
Right answers	1	1	0	3	0	0	0	0	0
Wrong Answers	2	1	1	0	0	0	0	1	3
VISUAL RECOGNITION									
Right answers	1	3	1	3	2	1	1	2	1
Wrong Answers	2	1	2	0	0	2	1	3	3
WRITTEN RECOGNITION									
Right answers	1	3	1	4	2	2	2	2	2
Wrong Answers	2	1	2	0	0	3	2	5	6
OPINION									
Video Adds	1	10	1	10	10	5	5	2	1
Billboards	8	10	7	1	10	9	9	9	10
Product placement	9	10	6	10	10	9	9	9	10
PP Ads realism to the game?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Have you been affected by in-game ads	Y	Y	N	N	Y	Y	Y	Y	Y

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

GENERAL QUESTIONS									
Environment	3	3	3	3	3	3	3	3	3
Sex	M	M	M	M	M	M	M	M	M
Age	15	14	15	16	16	13	16	13	14
Occupation	Student	Student	Student	Student	Student	Student	Student	Student	Student
Playing time per week	10	24	0	0	2	2	7	4	6
Recalls in-game ads	Y(4)	Y(4)	Y(2)	N	Y(2)	N	N	Y(3)	N
Football matches watched per week	5	2	2	2	1	1	2	3	0
RECALL									
Remembers brands or products	Y	Y	Y	N	Y	N	Y	N	N
Right answers	1	1	0	0	1	0	1	0	0
Wrong Answers	1	1	0	0	0	0	0	0	0
VISUAL RECOGNITION									
Right answers	0	1	1	0	1	0	2	0	0
Wrong Answers	0	0	0	0	2	1	0	1	0
WRITTEN RECOGNITION									
Right answers	0	2	1	0	0	0	2	0	0
Wrong Answers	1	1	0	0	2	3	1	1	0
OPINION									
Video Adds	3	3	5	5	2	2	2	10	2
Billboards	10	9	5	10	5	5	10	10	5
Product placement	10	8	5	10	2	3	10	10	9
PP Ads realism to the game?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Have you been affected by in-game ads	N	N	Y	Y	Y	N	Y	Y	N

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

GENERAL QUESTIONS									
Environment	3	4	4	4	4	4	4	4	4
Sex	M	M	M	M	M	M	M	M	M
Age	16	12	18	21	13	15	13	14	20
Occupation	Student	Student	Student	Student	Student	Student	Student	Student	Student
Playing time per week	12	20	6	16	12	12	8	10	1
Recalls in-game ads	Y(5)	Y(2,6)	N	Y(2)	Y(2)	Y(2)	Y(2)	Y(2)	Y(2)
Football matches watched per week	0	1	2	2	2	0	3	3	1
RECALL									
Remembers brands or products	N	Y	N	Y	Y	Y	Y	Y	Y
Right answers	0	1	0	2	2	2	3	3	1
Wrong Answers	0	0	0	2	1	1	0	0	0
VISUAL RECOGNITION									
Right answers	0	1	1	4	1	1	2	1	1
Wrong Answers	3	2	0	2	1	2	1	1	0
WRITTEN RECOGNITION									
Right answers	1	2	2	3	3	3	2	4	1
Wrong Answers	4	3	0	5	3	1	2	5	0
OPINION									
Video Adds	1	1	2	5	1	1	1	10	7
Billboards	10	5	8	10	10	10	10	10	7
Product placement	10	10	9	10	10	10	10	10	7
PP Ads realism to the game?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Have you been affected by in-game ads	N	Y	N	Y	N	N	N	N	Y

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

GENERAL QUESTIONS					
Environment	4	4	4	1 - Kingdom Rush	1
Sex	M	M	M	2- FIFA	19
Age	17	15	20	3-PES	2
Occupation	Student	Student	Student	4-WWE	2
Playing time per week	40	16	3	5-Call of Duty Black Ops	1
Recalls in-game ads	Y(7)	Y(2)	Y(2,6)	6-GTA5	2
Football matches watched per week	2	2	2	7-Trackmania	1
RECALL					
Remembers brands or products	Y	Y	Y		
Right answers	0	1	0		
Wrong Answers	0	0	0		
VISUAL RECOGNITION					
Right answers	0	1	1		
Wrong Answers	1	0	1		
WRITTEN RECOGNITION					
Right answers	0	1	2		
Wrong Answers	0	1	0		
OPINION					
Video Adds	6	1	6		
Billboards	10	7	10		
Product placement	10	7	10		
PP Ads realism to the game?	Y	Y	Y		
Have you been affected by in-game ads	Y	N	Y		

5.2.2 – Right and Wrong Answers on all answers

Recall (Right)				Recall (Wrong)			
Environment 1	Environment 2	Environment 3	Environment 4	Environment 1	Environment 2	Environment 3	Environment 4
3	1	1	1	0	2	1	0
0	1	1	0	0	2	1	0
0	1	0	2	0	1	0	2
0	0	0	2	0	1	0	1
0	3	1	2	0	0	0	1
0	0	0	3	0	0	0	0
0	0	1	3	0	0	0	0
0	0	0	1	2	0	0	0
0	0	0	0	0	1	0	0
0	0	0	1	0	3	0	0
0			0	0			0
0				0			
1				0			
0				0			
1				0			
1				0			
1				0			

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

Recogniton (images) (Right)				Recognition (Images) (Wrong)			
Environment	Environment	Environment	Environment	Environment	Environment	Environment	Environment
1	2	3	4	1	2	3	4
2	1	0	1	3	2	0	2
2	1	1	1	11	2	0	0
0	3	1	4	0	1	0	2
0	1	0	1	0	2	0	1
0	3	1	1	0	0	2	2
0	2	0	2	0	0	1	1
2	1	2	1	1	2	0	1
0	1	0	1	3	1	1	0
0	2	0	0	0	3	0	1
0	1	0	1	1	3	3	0
1			1	0			1
0				0			
1				0			
0				0			
0				1			
0				0			
2				1			

Environment effects on recall and recognition of brands in in-game advertising: A FIFA 15 Study

Recogniton (text) (Right)				Recognition (Text) (Wrong)			
Environment	Environment	Environment	Environment	Environment	Environment	Environment	Environment
1	2	3	4	1	2	3	4
4	2	0	2	1	3	1	3
3	1	2	2	17	2	1	0
0	3	1	3	0	1	0	5
0	1	0	3	0	2	0	3
0	4	0	3	0	0	2	1
0	2	0	2	1	0	3	2
2	2	2	4	0	3	1	5
1	2	0	1	1	2	1	0
0	2	0	0	0	5	0	0
0	2	1	1	0	6	4	1
1			2	0			0
0				0			
1				0			
0				0			
1				0			
1				0			
0				0			