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The effects of in-game advertising on players' explicit and implicit memory, attitudes and purchase intentions

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Preface

This thesis is a 30 ECTS project for completion of a Master of Science degree in Marketing and International Business at the University of Iceland. Friðrik Eysteinsson, adjunct professor, supervised the research and I thank him greatly for his guidance and support.

I thank my family and friends for their encouragement and for all their assistance. I also thank the participants of the study, the employees of Digon Games, and all the people who proofread my thesis.

Thank you all.

Abstract

The study described in this thesis examined the effects of in-game advertising in online computer games on players' memory of the brands (implicit and explicit), attitudes towards the brands and purchase intentions. An experiment was designed with gamers randomly assigned to one of two conditions: (1) gamers playing the online computer game with sponsor brands already embedded in the game or (2) gamers selecting the sponsor brands and then playing the same game. A third group, a control group, only answered a questionnaire online and did not play the game.

No studies measuring all the following mindset metrics in the same study on in-game advertising seem to exist: memory of the brand (implicit and explicit), attitude towards the brand and purchase intentions. Also, no studies seem to exist that measured the effects of in-game advertising when the game players selected sponsor brands before playing the game.

Implicit memory was measured using a word-fragment completion task while explicit memory was measured using recall and recognition tests. Results showed that when sponsor brands are selected before playing the game, game players' explicit and implicit memory improves significantly.

Attitudes towards the brands and purchase intentions were measured using three seven-point scales. Results showed that when the brands are selected before playing the game, it did not significantly influence their attitudes towards the sponsor brands in the game. The game players did however have significantly higher purchase intentions towards the sponsor brands in the game.

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1   Introduction

The expansion of the online game industry, combined with the fragmentation of traditional media and the development of the Internet, has driven advertisers to embrace new advertising methods, such as in-game advertising of reaching their target audiences (Ho, Yang, and Lin, 2011; Yang, Roskos-Ewoldsen, Dinu, and Arpan, 2006). In-game advertising refers to the placement of brands in games (Yang et al., 2006), usually in the form of billboards, posters, or sponsor signage, and is similar to product placement in movies or television shows (Chaney, Lin, and Chaney, 2004; Lee and Faber, 2007).

The first examples of in-game advertising were static, or unchanging, consisting of virtual billboards or in-game product placements. Artists or programmers placed these advertisements, which could not be altered, directly into a game. The first example came in the 1978 computer game Adventureland by Scott Adams, who inserted an advertisement for his then-forthcoming game Pirate Adventure (ESA, 2012). Due to the growing popularity of online games, and, especially for games that are available on social networking sites, in-game advertising can potentially reach a large number of gamers. Hence, it is not surprising that advertisers have been interested in this new advertising medium.

In 2003, $79 million was spent on in-game advertising and this spending is anticipated to grow to $1 billion by 2014 (ESA, 2012). In-game advertising offers the potential for companies to reach the elusive target group of males aged 18-34, a group that spends a lesser amount of time watching television and more of their time using the Internet and playing computer, video and online games (Activision, 2004; Chaney et al., 2004; Lewis and Porter, 2010). In-game advertising has been used by a wide range of companies, such as Nike, Ford, Coca-Cola, Pepsi, and Nabisco (Winkler and Buckner, 2006).

Finding ways to improve the effectiveness of in-game advertising is an important issue for both the online game industry and advertisers.

1.1   Purpose

Little is known about whether in-game advertising influences players' memory of sponsor brands, attitudes towards the brands, purchase intent, and so forth (Yang et al., 2006).

The interactive characteristics of games could interfere with players' memory for in-game advertising, which may again interfere with memory for in-game brand placements (Liu and Shrum, 2002; Yang et al., 2006). The higher the level of immersion (higher involvement), the higher the interference and the lower the recall and recognition of brands present in games (Chaney et al., 2004; Lee and Faber, 2007; Yang et al., 2006). The immersion-factor also led to the opposite desired effect on purchase intents towards brands placed in games (Chaney et al., 2004).

The purpose of the study described in this thesis was to find out which type of in-game advertising has the greatest effect on memory of brands (both explicit and implicit), brand attitudes and purchase intentions: one where the brand is already embedded in the game versus a new approach where the player selects the brand before playing the game. The study was conducted among university students, one of the groups that most frequently play video games (Yang, et al, 2006). Allowing players to select sponsor brands before they actually play an online computer game could result in greater memory of the sponsor brands, more positive attitudes and higher purchase intentions.

1.2   Outline of the thesis

The thesis starts with a review of the literature relating to in-game advertising, and with the formulation of a set of hypotheses. It will be followed by a detailed description of the methodology employed and a presentation of the findings. The final section is a discussion chapter on the analysis of this study in relation to previous' studies. It includes how the findings contribute to theory, managerial implications, the study's limitations and suggestions for future research.

2   Literature review

The first part of the literature review focuses on the Limited Capacity Model of Motivated Mediated Message Processing (LC4MP), the construct of involvement and mindset metrics in relation to in-game advertising. The second part of the literature review focuses on product placement and in-game advertising and its effects on brand memory, attitude toward the brand, purchase intentions, and the formulation of a set of hypotheses.

2.1   The Limited Capacity Model of Motivated Mediated Message Processing

Lang's (2006) LC4MP, an information-processing model, assumes people are information processors and that a person's ability to process information is limited. This is because humans only have a finite amount of resources available to process a message, and when these resources are exhausted, recognition suffers (Lang, 2006).

It is important to understand the process of attention, which is defined here as the allocation of cognitive capacity to a task (Kahneman, 1973; Lang, 2000). Automatic processes happen unconsciously and are unintentional on the part of the message recipient. Controlled processes happen consciously and are intentional. Based on the idea that the attention one pays to a stimulus varies depending on how resources are shifted between encoding, storage, and retrieval sub processes, it will also be important to understand how information is processed, either through processes that are automatic or controlled (Lang, 2006; Lee and Faber, 2007).

Conscious memory retrieval is referred to as explicit memory wherein a person actively attempts to remember previous information to which he or she was exposed. On the other hand, product information that is retrieved unconsciously is called implicit memory, which is when individuals remember past information without their conscious knowledge that they are performing such a task (Duke and Carlson, 1994; Shapiro and Krishnan, 2001). According to Grigorovici and Constantin (2004), game players are likely to allocate most of their cognitive resources to process the main message, the game

itself, leaving fewer resources available to use for encoding and storing the secondary messages, namely product placements.

Memory for a specific message is a collection of the outcome of all three sub processes; encoding, storage and retrieval (Lang, 2000). The message is thoroughly processed when sufficient resources are allocated to all three sub processes; however, not all information is always processed successfully. More specifically, when insufficient resources are allocated to sub processes, then cognitive overload will occur, causing some aspect of the message processing to suffer (Lang, 2000). For example, poor recognition levels indicate that the message has not been completely encoded due to cognitive overload (Lang, 2000). Two main factors may hinder successful processing of a message. First, the individual who receives the message may choose to allocate fewer resources to the task than it requires. Second, the message itself may require more resources than the individual has available to allocate to the task, resulting in a cognitive overload. With either factor, the message will not be thoroughly processed and thus the message recipient's memory will likely suffer as a result (Lang, 2000).

2.2 Involvement

There is little agreement about how to define involvement. Some researchers have defined it as a process (Greenwald and Leavitt, 1984), whereas others have conceptualized it as a state (Andrews, Durvasula, and Akhter, 1990). Although involvement has been defined in many different ways, most researchers appear to agree that involvement is grounded in motivation (Laczniak, Muehling, and Grossbart, 1989; Pham, 1992). In this study, we consider game involvement as a motivational state to exert cognitive effort at playing the game, and that its primary antecedents are a game player's desire to beat other game players.

Researchers have examined the role of involvement in memory of advertisements in a variety of media, including television, magazines, and online games (Grigorovici and Constantin, 2004; Pham 1992). Although there have been conflicting results (for example positive versus negative effects of involvement on brand memory), it appears that indeed there is an inverted U-shaped relationship between involvement and memory of

advertisements (Pham, 1992). Researchers have suggested that consumers, who experience greater involvement, allocate greater cognitive resources. As consumers' involvement increases to an extremely high level, however, they start to experience the limiting aspects of their ability to process information. As consumers approach the limit of their cognitive capacity, their attention narrows to, for example, only the online game and they block out other stimuli such as the accompanying ads (McClung, Park, and Sauer, 1985). In addition, Pham (1992) found a curvilinear relationship between involvement (low, medium, or high) when watching a soccer game on television and recognition of the sponsor brands on sideboards around the game.

While a full range of involvement is likely to occur with the use of more passive media such as television, extremely low levels of involvement are harder to envision with more game playing (Lee and Faber, 2007). Theoretically, at very low levels of involvement with the game, a game player would not even put in the effort to play it because of his or her overall lack of interest. If playing does occur, it is likely that the motivation to perform well would create at least some moderate level of involvement. In a moderate-involvement game situation, the requirements of the game itself should receive some amount of attention, but generally not full attention. This will allow some attention capacity to be allocated to the embedded brands (Lee and Faber, 2007).

When the player's involvement level is extremely high, the player will consume full resources in playing the game and approach his or her limit of resource capacity. In this case, the player's attention should increasingly narrow to focus on the game action at the expense of brands within the game. Consequently, brands may not be fully processed at high levels of involvement (Lee and Faber, 2007).

2.3   Mindset metrics

Mindset metrics, measures of consumers' perceptions, attitudes and intentions, have a long history in marketing, especially in the advertising world and are the building blocks of the hierarchy-of-effects model of advertising (Palda, 1966; Srinivasan, Vanhuele, and Pauwels, 2010; Vakratsas and Ambler, 1999). Many marketers believe that behavioral or output measures have to be complemented by mindset metrics (Srinivasan et al., 2010). Marketing's role is in moving customers through different phases of the hierarchy.

Specific actions that strengthen the position of the brand in customers' hearts and minds' may not have translated into purchases yet. Mindset metrics are needed to verify that marketing moved customers in the right direction (Keller and Lehmann, 2006).

The central idea of this model (see Figure 1) is that each advertising exposure moves consumers forward in a hierarchical sequence of events, like memory of the brand, attitude towards the brand and purchase intent resulting ultimately in brand purchases (Srinivasan et al., 2010).
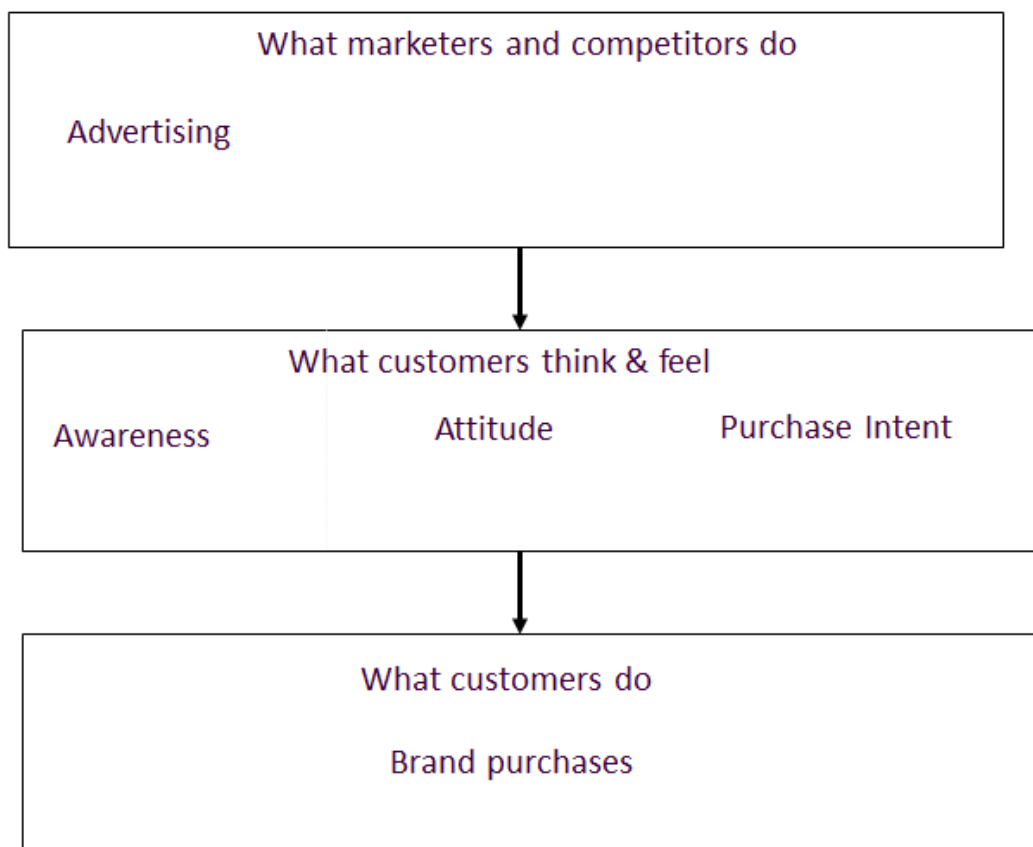
Source: Adapted from Srinivasan et al., 2010

Figure 1 Framework – Advertising, customer mindset metrics and brand performance

2.4 Product placement

Product placement, also known as product brand placement, in-program sponsoring, branded entertainment, or product integration is an emerging form of marketing communication wherein a brand name, product, package, signage, or other branded merchandise is inserted into and used contextually in a motion picture, television

program, or other media vehicle for commercial purposes (Williams et al., 2011). In product placement, the audience gets exposed to brands and products during the natural process of the movie, television program, or content vehicle. That is, product placement in mass media provides exposure to potential target consumers and shows brands being used or consumed in their natural settings (Williams et al., 2011).

The strategic use of brand placements has been an advertising technique employed by advertisers for more than 50 years (Babin and Carder, 1996). In scholarly research, brand or product placement is generally defined as: "A paid product message aimed at influencing movie (or television) audiences via the planned and unobtrusive entry of a branded product into a movie (or television program)" (Balasubramanian, 1994). This statement can now be adapted to include online games. Karrh (1998) defined product placement as "inclusion of commercial products or services in any form in television or film productions in return for some sort of payment from the advertiser". Although product placements are commonly used in various media, the understanding of consumers' responses to such messages remains limited, due to technical difficulties in testing (Balasubramanian, Karrh and Patwardhan, 2006). Still, it has been maintained that as the audiences cannot skip or turn off the advertisements, they are captive audiences for the brands.

Product placement is not new (Balasubramanian, 1994). Originally, product placement served as a way for movie studios and television networks to reduce the cost of production through borrowed props. Brand/product placements first appeared in Lumiere films in Europe in 1896 (Newell, Salmon, and Chang, 2006). Product placement has traditionally been most prominent in film, whereby products or services have been included in movies in return for cash or reciprocal promotional exposure (Nebenzahl and Secunda, 1993). Branded products emerged in film in the 1920s, and began to appear consistently through the 1950s and 1960s (Wenner, 2004). It was not until the 1980s however that product placement gained momentum, for example the cameo of Reese's Pieces in the 1982 film E.T. The Extra-Terrestrial. Weaver (2007) gives numerous examples of product placements related to tourism; for example, the film Sideways promoting wine tourism in California's Napa Valley, the Ritz-Carlton hotel chain selling Sealy mattresses on the Internet, Holiday Inn Express selling Kohler's Stay Smart shower head, Showtime and HBO in many hotels and motels, and Southwest Airlines serving Nabisco products. Yahoo! has produced branded

video content; 5-10 minute "webisodes" that usually feature story lines around a specific product such as a show about someone driving cross country in a Toyota Hybrid, sponsored by Toyota (Williams et al., 2011).

Russell (1998) classified product placement along three dimensions: Visual, auditory and plot connection (see Figure 2). A visual placement involves placing a brand in the background of a show, with consideration given to the appearance of the brand on-screen, number of appearances and the style of camera shot. An auditory or verbal placement occurs when a brand is mentioned in a dialogue and can vary depending on the frequency with which it is mentioned, the context and the emphasis on the brand name. Finally, the plot connection dimension refers to the integration of a brand with a story's plot. This type of placement involves a combination of visual and verbal components and can vary in intensity from a mention of the brand and a brief appearance, to the brand's central role in the plot and identification with a character. Russell's dimensions have relevance across a variety of media. Kuhn (2008) proposed a fourth dimension to reflect the emergence of brands and products in interactive media such as electronic games. Here, the use of placements does not occur in a real world context, but in essence is simulated in this medium (simulated placement).
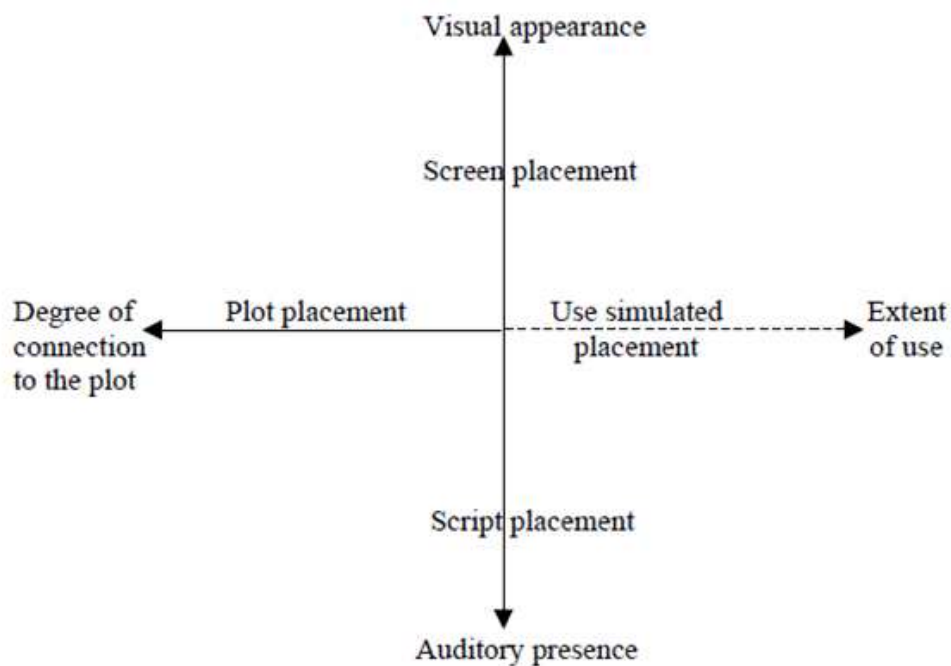
Source: Adapted from Russell, 1998 (Kuhn, 2008)

Figure 2 Product placement construct

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Gupta and Lord (1998) offered a two-dimensional approach for categorizing types of product placement, with the first being mode of presentation and the second being level of prominence. They categorize product placements according to three modes that represent the subtlety or prominence of the placement: visual, verbal and combined. Subtle placements are those placements where the brand may be merely mentioned or featured as a background prop, thus not central to the scene. Prominent placements are those in which the brand is highly visible and central to the story. Sheehan and Guo (2005) recognized the difference between brand/product integration, where the brand was integral to the plot, and brand/product assimilation, where the brand becomes the plot.

Product placement can be very effective (Williams, Petrosky, Hernandez, and Page, 2011). Its purposes include achieving prominent audience exposure, visibility, attention, and interest; increasing consumer memory and recall; changing consumers' attitudes or overall evaluations of the brand; changing the audiences' purchase behaviors and intent; creating favorable practitioners' views on brand placement; and promoting consumers' attitudes towards the practice of brand placement and the various product placement vehicles (Williams et al., 2011). As noted by van Reijmersdal, Neijens, and Smit (2009) and Williams et al., (2011), a substantial part of the effects and interactions of product placement is still unknown.

Product placement in online games can be classified into two major categories: in-game advertising and advergaming (Apperley, 2006; Cauberghe and De Pelsmacker, 2010; Faber, Lee, and Nan, 2004). As suggested by Winkler and Buckner (2006), with in-game advertising, advertisers buy product placement space within an existing game. Multiple brands are present and usually static in the background of the main action (e.g. buying a billboard in a sports game) similar to product placement in television programs or movies (Yang, Roskos-Ewoldsen, Dinu, and Arpan, 2006). An example of in-game advertising is when Ford and Nike agreed in 2007 to display their brands in the four most popular video game platforms including Nintendo's Wii or Sony's PlayStation (Tangmanee and Rustanavibul, 2012). On the other hand, advergames are custom-online games designed specifically for a brand (Gross, 2010). For example, in 1992, Cheetos snacks created two advergames in order to draw the target's attention (Tangmanee and Rustanavibul, 2012). The brand is often central to game-play and the game is the brand message (Gross, 2010). In this study, in-game advertising is of focal interest.

2.5 Memory effects

Memory measures pervade advertising research and act as an important means of examining issues such as the effectiveness of marketing communications and product evaluation. Recently, a number of scholars suggested that memory should be further divided into explicit memory and implicit memory (Gross, 2010; Shapiro and Krishnan, 2001; Yang et al., 2006). Most academic studies use memory-based tests to test the effectiveness of product placements. This seems appropriate because increased brand awareness is often one of their goals (Nelson, 2002; Williams et al., 2011).

Brand awareness is related to the strength of the brand node or trace in memory, as reflected by consumers' ability to identify the brand under different conditions (Keller, 1993; Keller, Aséria, and Georgson, 2008). That entails that the brand´s target market either recalls and/or recognizes the brand during various purchase or consumption occasions. Brand awareness is crucial to differentiating your brand from other similar brands and competitors, and plays a major role in a consumer's buying decision process.

Keller, Aséria and Georgson (2008) discuss three advantages to creating a high level of brand awareness. First, it is important that consumers think of the brand when they think about the product category. Raising brand awareness increases the likelihood that the brand will be a member of the consideration set, the handful of brands that receive serious consideration for purchase. Second, brand awareness can affect decisions about brands in the consideration set, even if there are essentially no other brand associations. Finally, brand awareness affects consumer decision making by influencing the formation and strength of brand associations. A necessary condition for the creation of a brand image is that a brand node has been established in memory, and the nature of that brand node should affect how easily different kinds of information can become attached to the brand.

Explicit memory and implicit memory work within varied neural structures; explicit memory is characterized as conscious recollection while implicit memory is unconscious recollection (Yang et al., 2006). If the advertiser's goal by product placement is to increase brand awareness, explicit measures might be suitable measures of effectiveness. However, for consumers' buying decisions, implicit memory has been demonstrated to be a better measure of effectiveness for memory, because it is more closely related to the consumer's actual behavior than explicit memory (Ho et al., 2011).

As the results of several studies (Law and Braun, 2000; Shapiro and Krishnan, 2001; Yang et al., 2006) have indicated, it could be helpful to include tests of both explicit and implicit memory in advertising experiments in order to gain a better understanding of memory effects in brand messaging. Since studies have found dissociation between explicit and implicit memory, it is beneficial to measure both explicit and implicit memory to better understand memory effects of product placements (Yang et al., 2006). Thus, the current research investigates the effectiveness of product placement using two types of mindset metrics measures: explicit memory and implicit memory.

Before research on the effects of in-game advertising on explicit and implicit memory will be reviewed, we will start with a review of the research on the effect of product placement on memory in traditional media. In-game advertising shares many of the strengths of brand or product placement in television programs or movies (Yang et al., 2006), where one of the goals of brand placements is to increase the audience's familiarity with the brand so that consumers are more likely to remember it (D'Astous and Chartier, 2000; Lee and Faber, 2007; Nelson, Keum, and Yaros, 2004; Youn, Lee, and Doyle, 2003). Consequently, much of the empirical research on brand placements has focused on viewers' memory for the brands placed within a movie or television program (Karrh 1998; Yang et al., 2006). Generally, the research on the effects of brand placement on brand memory has yielded mixed results (Babin and Carder 1996; Ong and Meri 1994; Yang and Roskos-Ewoldsen, 2007).

Some studies have found high levels of recall and recognition for brands placed in film (e.g. Babin and Carder, 1996) and television programs (Russell, 2002). Other investigations have revealed inconsistent or insignificant effects. In an experiment conducted by Karrh (1994) to explore the effects of product placement in films, brand salience was significantly higher for only one brand prominently and repeatedly displayed. Bennett, Pecotich and Putrevu (1999) found evidence of recall effects, but amongst respondents that were in the group that viewed a listing of all the placed products, prior to the opening credits in the movie. D'Astous and Chartier (2000) found high levels of recognition, but low levels of recall in a study among moviegoers. Ong's (2004) study of American prime time television programs reported relatively low levels of brand recall; Ong and Meri (1994) found low levels of unaided recall of brand props. They also found little improvement in memory for some brand placements and remarkably large improvements in memory for others.

The conflicting findings reported in the product placement literature may be due to the fact that recall depends on several factors, including stimulus, situational and individual factors (Williams et al., 2011). For example, studies found that placements that are more visually prominent result in greater memory for the brand than do less prominent placements (Brennen et al., 1999; d'Astous and Chartier, 2000; Gupta and Lord, 1998; Law and Braun, 2000). Russell (2002) tested the effect of different levels of plot connection on brand placements. One of the most important findings of his study was that recognition rates for products with high plot visual placement are higher than recognition rates for products with low plot visual brand placement.

Unlike product placements in television programs or movies, the audience for online computer games does not passively watch the program or movie and process the additional stimuli of the advertised products (Leng, 2011). It is often assumed that the number of people playing a game is equal to the number of people actually paying attention to the sponsor brands embedded in the game. A game player is engaged in playing the game, however, and that is what occupies his/her primary attention. Since brands displayed in a game are not the focal object of attention, it is important for advertisers to determine whether they are actually being noticed (Lee and Faber, 2007). By devoting attention to playing a game, the player will have less attention capacity available to process the additional stimuli of advertisements in a game (Schneider and Cornwell, 2005; Yang et al., 2006).

Nelson's 2002 paper "Recall of brand placements in computer/video games" was the first research done on brand placements in computer games. The study was conducted to determine consumers' awareness of local and national brand advertisements. Recognition of sponsors was examined via a longitudinal study with 13 console gamers. The gamers played a car racing game and were surveyed on brand recall and recognition. The results of the experiment revealed that advertisements were somewhat recalled, 25-30% on a short term basis, and 10-15% five months later. This shows fairly high levels of decay.

Another study (Lee and Faber, 2007) manipulated the location (focal versus peripheral) of the in-game advertisements like the Nelson (2002) study, but also incorporated the factors of game involvement, prior game playing experience and game-product congruity. In general, the researchers found that focal product placement led to higher recall and recognition than did peripheral placement.

Nelson et al. (2006) differentiate between the degrees of involvement in a computer game. As far as the impact of in-game advertising is concerned, effects on brand memory can be discerned. Results showed that playing the game impeded recall. The primary task for game players is playing the game (Huang and Yang, 2012). Game players are more likely to devote most of their controlled resources to encoding the game stimulus, choosing to allocate fewer resources to other game-irrelevant stimuli, such as embedded advertisements. Therefore, recognition of the embedded advertisement may simply depend on whether the nature of the stimulus can evoke the automatic selection process or not.

Other research has also shown that the recall rate of product placements are affected by their placement (Acar, 2007; Chaney et al., 2004; Lee and Faber, 2007; Leng, Quah, and Zainuddin, 2010). For instance in sports racing games, product placements that appear near the car are more likely to be remembered than those which are further away from the car. When they appear in a spot where the gamer is likely to be very focused on the game, the gamer is unlikely to notice them (Chaney et al., 2004). For example, billboards in sports racing games which appear in the background and have no consequence in the game play, are less likely to be noticed by players (Glass, 2007). However, if the billboards are large and colorful and gamers are repeatedly exposed to them, there is still the possibility that they are able to process the stimuli (Balasubramanian et al., 2006; Leng et al., 2010).

Chaney, et al, (2004) found that participants playing a first-person shooter game recalled going past billboards in the game, but had little memory for brands - or even for the product category - on the billboards. Similarly, Grigorovici and Constantin (2004) found a complex relationship between the type of placement (billboard versus the actual object), the players' immersion in the game, how arousing the game was, and brand recall. For example, participants tended to recall brands when they were placed on a billboard but not when they were actually present in the game world, except when the brand was an automobile. Likewise, higher levels of immersion in the game interfered with players' recall for brands placed in the game. While examining the effects of ad type and the relevance between the advertised product and the game content on player's memory toward the billboard placement embedded within a browser game, Huang and Yang (2012) found that animated billboard ads prompt better advertising effects than static billboard ads. The animated billboard ads generated higher ad recognition.

The above suggests that there are many factors affecting the effectiveness of in-game advertisements. Placement and prominence of the advertisement are found in the literature to have an effect on the rate of recall and recognition of in-game advertisements. However, no studies have examined whether players preselecting the sponsor brand as the in-game advertisement has a stronger effect on the recall and recognition rate of in-game advertisements, than when the players just play the game with the sponsor brands already embedded in the game. In this research, the effectiveness of in-game advertisements, and how this is influenced by players preselecting the sponsor brand prior to playing the game will be examined.

2.5.1 Implicit memory

The process by which information is unconsciously retrieved is called implicit memory, which is when an individual remembers past information without intentional recollection of a past event or without his or her conscious knowledge that he or she is performing such a task (Duke and Carlson, 1994; Gross, 2010; Shapiro and Krishnan, 2001; Yang et al., 2006). According to past brand placement studies, implicit memory is an important concept to measure in advertising research (Gross, 2010; Shapiro and Krishnan, 2001; Yang et al., 2006).

Implicit memory is important to account for from a practical standpoint because it can retrieve from memory the brands that an individual did not deliberately select for processing. For instance, implicit memory would be important to utilize when consumers do not deliberately search their memory for previously encoded information. A situation that would not require an effortful search of memory would be when people are making low involvement purchases and impulse buys (Shapiro and Krishnan, 2001).

Researchers have used implicit memory tasks as a way of measuring advertising effects because there are limitations to only using explicit memory measures (Ho et al., 2011; Shapiro and Krishnan, 2001; Yang et al., 2006). For instance, explicit memory measures can only account for advertising effects that are accessible to conscious processes; thus, implicit memory should also be measured to reveal the effects that are the result of unconscious processes. Implicit memory measures can detect incidental advertising exposures that can occur when people are not paying full attention to the advertisements (Shapiro and

Krishnan, 2001). Incidental advertising exposures will be important to consider in this study as the game players may not be devoting their full attention to the embedded brands while playing the game, especially if their goal is to play the game and not to attend to the brand.

According to many scholars (Grigorovici and Constantin, 2004; Lee and Faber, 2007; Yang et al., 2006), games require players' visual attention and motor actions, causing them to devote less attention to the sponsor brands embedded within the games, particularly those brands that appear in the background. Therefore, it is valuable to measure game players' implicit memory because it can reveal different advertising effects of brand placements in in-game advertisements than an explicit memory test may show.

A common method used to measure implicit memory is a word-fragment completion task (Duke and Carlson, 1993; Yang et al., 2006). In such a task, participants are instructed to fill in blanks that are missing in a word fragment in order to complete the word. This implicit memory task is given after the participants have been exposed to a target word, usually a brand name, to examine whether they have successfully been primed to remember the target word they were previously exposed to. In a word-fragment completion task, participants are asked to turn a word fragment (e.g., Nike can be tested as N_k_) into a meaningful word by filling in the missing letters. Notice that when completing a word-fragment completion task, participants are not asked to recall items they have been exposed to previously, but exposure to earlier items does tend to improve their ability to complete the word fragment. Instructions given to the participants make no reference to the previously completed task. Target words are often placed along with foil words on the test. A word is scored as correct if it matches the target word exactly in spelling. The goal is to examine whether priming has occurred. It is thought to have occurred if the completion rate for target words the participants have previously seen is higher than the completion rate for foil words. If this is the case, the participants are thought to have been primed to automatically and unconsciously retrieve the previously seen word/information (Duke and Carlson, 1994).

Law and Braun (2000) compared the use of implicit memory tests and explicit memory tests, arguing that implicit tests are a more appropriate test of memory as past experiences can shape the responses of participants. In Law and Braun's (2000) study, participants watched clips from the Seinfeld show that contained products placed audibly and/or

visually. After watching the clips and completing a distraction task, they were given an implicit product choice test. It was operationalized as a shopping list wherein each participant was asked to check the products they would choose to buy for a friend. The list contained the placed products as well as products that served as foils. This implicit task made no reference to the Seinfeld clips they had watched. Overall, the products that were featured in the clips were chosen at a higher rate than products that were not featured. Visually placed products were chosen the most, followed by seen-only products. Products that were featured both audibly and visually were chosen the least. This finding is particularly interesting, as explicit memory tests found the products featured in these types of placements were the most recalled and recognized. The authors also investigated the effect of visual prominence on implicit product choice; it was found to have no effect on choice.

Yang et al., (2006) used a word-fragment completion task and found that game players completed word-fill tasks for target brands at a much higher rate than for those of foil brands. The authors tested a racing game versus a soccer game and employed implicit and explicit memory measures. Participants were randomly assigned to one of three groups. The participants from all three groups were instructed to complete a word-fragment completion task. The results suggested that in-game advertising influenced implicit memory. Studies such as this one provide support for the idea that implicit memory is important to measure because game players may remember brands featured in a game without their conscious awareness.

The interactive characteristics of online games could interfere with players' memory for in-game advertising, which may interfere with memory for the in-game brand placements (Liu and Shrum, 2002; Yang et al., 2006). Therefore, the players may pay less attention to the brands that are placed as background features. Chaney et al., (2004) demonstrated that the immersion-factor lead to the opposite desired effect on the memory of brands. Thus, players of the football manager games are expected to show better implicit memory for brands when they select them before they play the game, than for brands placed in the game they do not select themselves and for brands that do not appear in either game (foils).

Specifically:

H1: Participants will show better performance on an implicit memory measure (i.e. they will have higher word-fragment completion rates) for sponsor brands that appear in an online computer game where they select the brands before playing the game than when they do not.

2.5.2 Explicit memory

Explicit memory occurs when people intentionally and consciously try to recollect a specific past event (Shapiro and Krishnan, 2001; Yang et. al., 2006). The two standard or primary measures of explicit memory, recall and recognition measure different aspects of explicit memory (Aaker, 1996; Keller, 1993; Yang et al., 2006).

Brand recall relates to consumers' ability to retrieve a brand from memory when given the product category, the needs fulfilled by the category, or some other type of probe as a cue (Keller, 1993). In other words, brand recall requires that consumers correctly generate a brand from memory (Aaker, 1996). Managers are more likely to use recall measures because they can understand by instinct and rapidly defend recall scores (Ho et al., 2011). Brand recognition relates to consumers' ability to confirm prior exposure to a brand when given the brand as a cue. For example, participants are asked whether they recognize seeing a brand.

The relative importance of brand recall and brand recognition depends on the extent to which consumers make decisions at the point of purchase (where they potentially may be exposed to the brand) versus outside a store, among other factors. Brand recognition may be more important to the extent that product decisions are made at the point of sale or purchase (Keller, 1993). Regarding product placement, most studies have used explicit memory measures to test effectiveness (e.g. Nelson, 2002). For the purposes of this study, both recall and recognition are measured.

The higher the level of immersion (higher involvement), the higher the interference and the lower the recall and recognition of brands present in a computer game. A study that measured game players' recall of fictitious brands in a racing game reported extremely low recall scores (Chaney, et al., 2004). The researchers attribute their findings to the limited processing capacity of players who were engrossed in game playing and not the peripheral elements (billboards). Thus, with respect to Lang's LC4MP (2006) model, players of an

online computer game are expected to show better explicit memory for brands when they select them before they play the game, than for brands placed in the game they do not select themselves and for brands that do not appear in the game (foils).

Specifically:

H2a: Recall rates for sponsor brands that appear in an online computer game where participants *select sponsor brands before playing the game will be higher than when they do not select them*

and

H2b: Recognition rates for sponsor brands that appear in an online computer game where participants *select sponsor brands before playing the game will be higher than when they do not select them.*

2.6   Attitude towards the brand

In addition to memory-based awareness measures, a way to measure the effectiveness of product placements is through attitudes (Nelson, 2002). This is because branded products embedded within online games can affect the attitudes players form toward the brands(Nelson et al., 2004). Attitudes are important because they often form the basis for consumers' behavior towards a brand (e.g. brand choice) (Keller et al., 2008).

Shimp (2000) defined the term attitude as a general and enduring positive or negative evaluative judgment of, or feeling toward, an object, such as a brand. As suggested by this definition, it features two components; a cognitive and an affective component. The cognitive component of brand attitude refers to an individual's beliefs about a brand including their knowledge and thoughts, while the affective component refers to an individual's feelings. This gives consumers an overall evaluation of a brand. In most product categories, the evaluation must be positive for an individual to consider making a purchase. This occurs because brand attitude represents a brand association, which influences a person to respond to an object (such as a brand) in a consistent way (Keller et al., 2008).

Few studies have sought to investigate the direct impact of product placement on brand attitudes, and those that exist have produced mixed results. Russell and Stern (2006) examined the influence of product placements in television comedies on consumer attitudes and found that consumers' brand attitudes are influenced by placed products.

Glass (2007) found that participants' attitudes towards known brands advertised in a video game were more positive than the attitudes towards known brands not advertised in the game. Cianfrone, Zhang, Trail and Lutz (2008) assessed the effectiveness of sport video games (SVG) in-game advertisements. Gamers were randomly assigned to 1 of 2 conditions: (a) experimental, playing an SVG with advertisements (known brands) or (b) control, playing an SVG without advertisements. Mean brand-attitude scores were not significantly different between groups. Findings by Mackay, Ewing, Newton, and Windisch (2009) suggest that an exposure to a particular known brand in a computer game can improve the attitudes of consumers of the brands. Also, participants that already had a pre-existing attitude towards a known brand demonstrated no improvement in their brand attitude after exposure to the known brand (Mackay et al., 2009). It is therefore expected that players of an online computer game where players select (and are exposed to) known sponsor brands (where they may likely have pre-existing brand attitudes) before playing a game will not have more positive brand attitudes than when they do not select sponsor brands and are only exposed to them while playing the game.

Specifically:

H3: Participants in an online computer game where participants select known sponsor brands before playing a game will not have more positive brand attitudes towards them compared to participants in an online computer game where they do not select the sponsor brands

2.7   Purchase intentions

Purchase intentions refer to the likelihood of buying a brand or the likelihood of switching from one brand to another (Armstrong, Morwitz, and Kumar, 2000; Keller et al., 2008). Product placements have been associated with increased purchase intent, particularly when products appear in sitcoms, for example, Ally McBeal in Nick and Nora pajamas, Frasier and Friends in Starbucks and New World Coffee, and Cosmopolitan martinis in Sex and the City (Russell and Stern, 2006; Williams et al., 2011). However, Ong and Meri (1994) did not find a relationship between brand appearances and purchase intentions.

Very few studies have been published on the direct impact of product placement within online computer games on consumers' purchase intent. Cianfrone et al., (2008) examined SVG in-game advertisements effects on gamers' purchase intentions. Gamers were randomly assigned to 1 of 2 conditions: (a) experimental, playing an SVG with advertisements or (b) control, playing an SVG without advertisements. Mean purchase-intention scores were not significantly different between groups. Embedded billboards were found to have a limited effect on product purchase intentions in a study by Chaney et al., (2004). The above results could have been due to the immersive nature of online computer games. It is therefore expected that players of an online computer game have higher purchase intention scores for sponsor brands when they select them before they play the game, than for brands placed in the game they didn't select themselves.

Specifically:

H4: Participants in an online computer game where participants select sponsor brands before playing the game will have higher purchase intention scores for the brands compared to participants in an online computer game where they do not select the sponsor brands

3 Method

3.1 Experimental design

An experiment was designed with gamers randomly assigned to 1 of 2 game conditions: (a) experimental, playing an online football manager game with sponsor brands already embedded in the game or (b) experimental, with gamers selecting the sponsor brands and then playing the same game. A third group, a control group answered a questionnaire online but did not play the game.

After playing the online football manager game, the participants in the two experimental groups completed a questionnaire for approximately 5 minutes in order to clear their short-term memory, prior to completing a questionnaire online.

The control group completed the word-fragment test and answered brand attitude and purchase intent questions. They did not answer the recall and recognition questions because it would not make sense to ask them to remember or recognize brands placed in a game they did not play. The control group provides a baseline completion rate for the word fragments.

A collaborator, Digon Games (www.digongames.com), created the two online game scenarios.

3.2 Participants and setting

Students at the University of Iceland were asked to participate in the study. A total of 127 students took part. They were randomly assigned to one of the two game conditions, 36 participants to experiment 1 and 36 to experiment 2. In the control group, 55 participants answered the questionnaire online. It has been found that college students are one of the groups that most frequently plays computer, video and online games (Jones, 2003; Yang et al, 2006).

Participants played the games in computer labs to control for factors which may distract their attention (Schneider and Cornwell, 2005), and thus have an effect on memory of the brands, attitudes towards the brands and purchase intentions. The participants were randomly assigned to two computer labs. In experiment 1, the participants played the game with the sponsor brands already embedded within the

game; thus they just started playing the actual game. In experiment 2, the participants selected a brand to sponsor their teams in the game, and then played the same game as used in experiment 1. In both cases, participants were exposed to the same five sponsor brands.

3.3 Procedures and stimuli

On arrival at the computer labs, participants were seated in front of computers and told they would be participating in an evaluation of a new online football manager game. Each participant was assigned a number, and told to go to a game Web site developed specifically for this study and log in using a unique ID number provided by the researcher.

After practicing for some time, with a basic training session (Lee and Faber, 2007) participants played three rounds of the game for exactly thirty minutes, to make sure they were exposed to all the brands. Five sponsor brands were used; please see Table 1 for an overview.

Table 1 List of sponsor brands used in the game

Brands	Logo
Apple	
Coca-Cola	
Carlsberg	
Nike	
1x2	

Participants in experiment 1 were instructed to select team outfits (kits) for his/her team(colors), but the sponsor brand had already been pre-selected for his/her team. Then they were asked to make offers for at least 4 players of the other teams. While doing that, they were exposed to the other four sponsor brands. Sponsor brands were embedded in players' kits as well as in the upper right corner of the screen of the individual teams.

The participants in experiment 2 were first asked to choose a brand from one of the five brands to sponsor his/her team, as well as the kits for his/her team before he/she started playing the game. Then they were also asked to make offers for at least 4 other players of the other teams. While doing that, they were also exposed to the other four sponsor brands. Sponsor brands were also embedded in the kits of the players as well as in the upper right corner of the screen of the individual teams.

Both groups were then instructed to set up their teams for the first game. After the 1st game was played, participants viewed the results and were exposed to the sponsor brands of their own team as well as that of their opponents. This exact procedure was repeated two more times for both experiments.

Thus, in experiment 1, the participants played the game with the sponsor brands already embedded within the game. In experiment 2, the participants selected a brand to sponsor his/her team in the game, and then played the same game used in experiment 1.

Immediately after playing the game, participants in the experiments completed a questionnaire for approximately 5 minutes in order to clear their short-term memory, prior to completing the main questionnaire.

3.4   Survey instrument

The online questionnaires were created with QuestionPro (www.questionpro.com). The one for the game players contained 16 questions; the first question required participants to check whether they participated in experiment 1 or experiment 2. The one for the control group contained 8 questions.

The gamers were then asked to answer questions which assessed their implicit and explicit memory (recognition and recall of brands), attitude towards the brands,

purchase intent and prior game-playing experience. Finally, there were some background questions for example gender of the participants, age group, and so on.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) v.20.0 program and visual processing in Microsoft® Excel. A number of statistical tests were conducted.

3.4.1 Implicit memory test

To measure implicit memory, a word-fragment completion task was given, similar to the one used in the study by Yang et al., (2006). Game players were required to fill in the missing letters in 15 word fragments, five that appeared in the game (e.g., _oc_-_o_a for "Coca-Cola") and 10 foils. See appendices 1 and 2.

3.4.2 Explicit memory test

Explicit memory was measured using both recall and recognition tests.

Brand recall

Brand recall was measured by asking participants to list all the brands that appeared in the game. If an advertised brand was not listed or if a non-advertised brand was listed, it was coded as an incorrect response. An answer was coded as correct if it was completely correct or if it appeared correct but was slightly misspelled. Since there were five different sponsor brands in the game, the number of correct responses could range from zero to five.

Brand recognition

Brand recognition was measured by presenting participants with 15 possible brands. They were then asked to indicate whether they appeared in the game. Of the 15 brands listed, 5 were advertised in the game, while the others were foils. Different foils were used than in the implicit memory test. See Table 2 for the list of both sponsor brands and foils used. The control group did not complete the recognition task. The answers were coded either as Yes or No depending on whether the participants recognized the brands being advertised or not.

Table 2 List of brands used in the brand recognition test

Brands in game	Foils	Foils
1x2	OXO	Kronan
Coca-Cola	Ladbrokes	Nokia
Apple	Adidas	Icelandair
Carlsberg	Henson	Ryan Air
Nike	Noatun	Tesco

3.4.3 Brand attitude

For each of the experimental games and the control group, brand attitudes towards each of the 5 sponsor brands were measured using 3 7 point semantic differential scales (Mackenzie and Lutz, 1989; Nelson, 2002; Yoo and Pena, 2011). For example: "For me, the brand Apple is _____; response alternatives included endpoints such as Good/Bad; Positive/Negative; and Valuable/Worthless.

3.4.4 Purchase intention

Purchase intention was measured using 3 7 point semantic differential scales (Yoo and Pena, 2011). Participants were asked to state how likely they are to purchase products from the sponsor brands from "now until Christmas", where, 1="extremely unlikely" and 4="neutral" and 7="extremely likely"; 1="definitely false"; 4="neutral" ; 7="definitely true"; and 1="strongly disagree" and 4="neutral" and 7="strongly agree".

4   Results

A total of 127 students participated in the study. They were randomly assigned to one of two game conditions, 36 participants to experiment 1 and 36 to experiment 2. In the control group 55 participants answered a questionnaire online. In experiment 1, most participants (86%) were between the ages of 18 and 25, 14% were between the ages of 26-34; 31 were male and 5 female. In experiment 2, the majority was also between the ages of 18-25 (92%); 28 were male and 8 female. In the control condition, 51% were between the ages of 18 and 25, 36% in the ages from 26-34; 18 were male and 37 female.

The majority in the experimental groups had played online games for more than 4 years (n= 72; m= 4.12). When they were asked how many times a week they played football manager games, 69.4% in experiment 1 replied never, 11.1% replied 1 time a week, 8.3% 2-3 times a week and 11.1% more than 5 times a week. In experiment 2, 86.1% replied never, 2.8% 1 time a week, 5.6% 2-3 times and 5.6% more than 5 times a week.

Descriptive statistics for the background variables for the groups are presented in Table 3.

Table 3 Descriptive statistics for the background variables for the different groups

Background variable	Category	Experimental Group 1 (n=36)		Experimental Group 2 (n=36)		Control Group (n=36)		Total (n=127)	
		n	%	n	%	n	%	n	%
Gender	Male	31	86%	28	78%	18	33%	77	61%
	Female	5	14%	8	22%	37	67%	50	39%
Age, years	18-25	31	86%	33	92%	28	51%	92	72%
	26-34	5	14%	2	6%	20	36%	27	21%
	35-44	0	0%	1	3%	5	9%	6	5%
	44 or older	0	0%	0	0%	2	4%	2	2%
Computer game experience	< 2 years	4	11%	1	3%			5	7%
	2-5 years	2	6%	1	3%			3	4%
	6-8 years	2	6%	7	19%			9	13%
	9-12 years	9	25%	6	17%			15	21%
	> 13 years	19	53%	21	58%			40	56%
Times playing football manager games a week	0 times	25	69%	31	86%	54	98%	110	87%
	2-3 times	4	11%	1	3%	0	0%	5	4%
	4-5 times	3	8%	2	6%	1	2%	6	5%
	> 5 times	4	11%	2	6%	0	0%	6	5%
Disposable income	< 50.000 kr.	7	19%	5	14%	5	9%	17	13%
	50.001 - 100.000 kr.	2	6%	4	11%	6	11%	12	9%
	100.001-150.000 kr.	7	19%	6	17%	4	7%	17	13%
	150.001 - 200.000 kr.	3	8%	2	6%	10	18%	15	12%
	200.001 - 300.000 kr.	3	8%	1	3%	8	15%	12	9%
	> 300.000 kr.	12	33%	11	31%	17	31%	40	31%
	Do not want to answer	2	6%	7	19%	5	9%	14	11%
Nationality	Icelandic	33	92%	32	89%	48	84%	112	88%
	Other nationality	3	8%	4	11%	7	12%	15	12%
School (department	Education	2	6%	0	0%	4	7%	6	5%
	Humanities	0	0%	1	3%	9	16%	10	8%
	Engineering and Natural Science	19	53%	26	72%	15	27%	60	47%
	Social Sciences	12	33%	7	19%	13	24%	32	25%
	Health Sciences	3	8%	2	6%	14	25%	19	15%

4.1 Memory

4.1.1 Implicit memory test: Word-fragment test

The proportion of the 5 brands correctly completed by participants was analyzed using a one-way ANOVA (analysis of variance) with three conditions (experiment 1, experiment 2, or control group).

As expected, the proportion of the 5 brands correctly completed was higher for those who participated in experiment 2, M = .60, SD = .21; $F(2,126) = 15.04$, $p < .001$, than the proportion correctly completed by the ones in experiment 1, M = .37, SD = .16,

or those in the control condition who played no game, M = .37, SD = .24. The results can be seen in Figure 3.
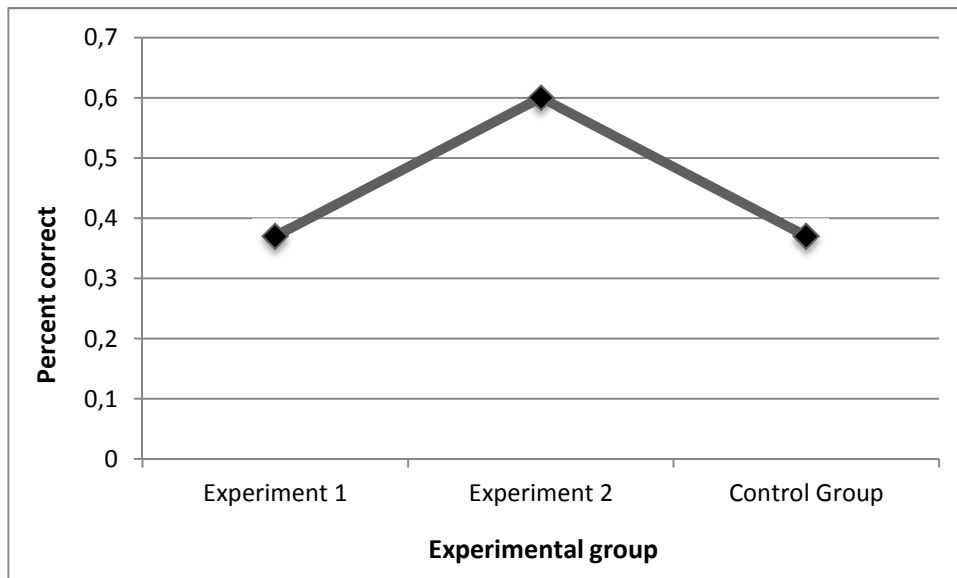
Figure 3 Performance on word-fragment test

Therefore, hypothesis 1 was supported. Participants perform better on an implicit memory test (i.e. they have higher word-fragment completion rates) when they select sponsor brands that appear in an online computer game before playing the game than when they do not.

The performance of players in experiment 1 and the control group were not significantly different.

4.1.2 Explicit memory test

Recall

To measure the recall of the brands in the game, the proportion of the correct recall of the 5 sponsor brands was compared using an independent t-test with two conditions (experiment 1, experiment 2). The highest recall score possible was 5, while the lowest was 0.

As hypothesized, brand recall was significantly influenced by the different experimental conditions (experiment 1 and 2); t(70) = 12,80; p < 0,001. It was

significantly higher for participants in experiment 2 (M = 3.69; SD = .86) than for participants in experiment 1 (M = 1.06; SD = .89). See Figure 5. Average recall scores for the sponsor brands in experiment 1 was 21% and for Experiment 2, 74%.
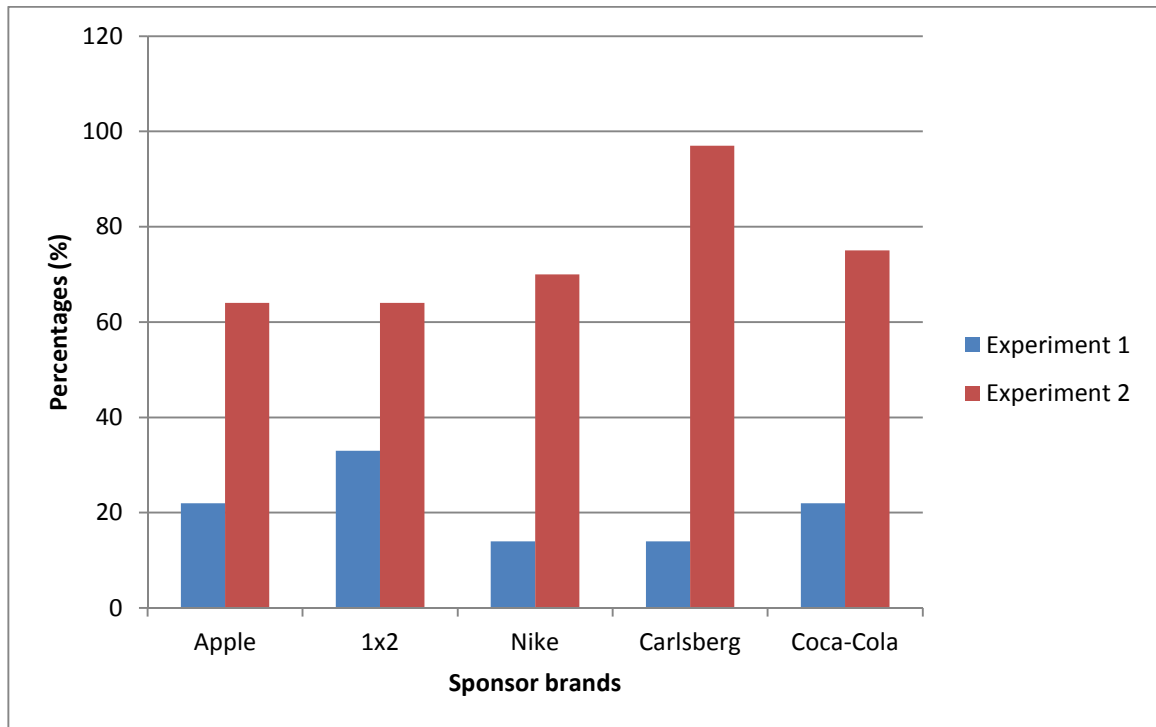
Figure 4 Brand recall scores in experiment 1 versus experiment 2

Therefore, hypothesis 2a was supported; recall rates for brands that appear in an online game where participants select the sponsor brands before playing an online game will be greater than when they do not select them.

Recognition

For the calculation of the recognition rates, the hit response rate was determined by calculating the proportion of correct recognition of brands appearing in each experiment. For example, if the participants said "yes" to a brand (e.g. Nike) that actually appeared in the football manager game, this response was considered a hit, or a correct response. False alarms were registered if the participants indicated that they saw a brand that did not actually appear in the game. Hit and false alarm rates from both game conditions are presented in Table 4.

Table 4 Comparison of recognition rates for brands from the two different experiments

	Hit	False alarm
Experiment 1	0.30	1.00
Experiment 2	0.86	0.99

Overall, the correct response rate for the sponsor brands in experiment 1 was 30% and experiment 2, 86%. The recognition rate is high in experiment 2 (M = 4.25; SD = 1.02) and low in experiment 1 (M = 1.50; SD = 1.06). In experiment 1 there were no false alarms and only 1 in experiment 2, thus chance levels were not calculated.

An independent t-test with two conditions (experiment 1, experiment 2) showed that the difference in recognition rates was statistically significant, t(70) = 11.22, p < .001. Thus, hypothesis 2b was also supported: Recognition rates for sponsor brands that appear in an online computer game where participants select the brands before playing the game are higher than when they do not select them.

4.2   Brand attitude

Reliability of the scale used was tested. It was found reliable with a Cronbach alpha value of 0.81. All of the Cronbach alpha values were higher than the minimum acceptable level (0.7). Participants' responses to the three questions were averaged to create an attitude index.

A one-way ANOVA with three conditions (experiment 1, experiment 2, or control group) was used to compare the attitudes towards the sponsor brands. Participants in experiment 2 had more positive attitudes towards the brands, M = 4.49; SD = .90 than the participants in experiment 1, M = 4.28; SD = 1.00 and the control group, M = 4.08; SD = 1.04 even though there was no significant difference between the three groups. Thus, the results support hypotheses 3: Participants in an online computer game where participants select known sponsor brands before playing the game will not have more positive brand attitudes towards the brands than participants who do not select the sponsor brands.

4.3 Purchase intention

Reliability of the scale used was tested. It was found reliable with a Cronbach alpha value of 0.856. All of the Cronbach alpha values were higher than the minimum acceptable levels (0.7). Participants' responses to the three questions were averaged to create a purchase intention index.

A one-way ANOVA with three conditions (experiment 1, experiment 2, or control group) was used to compare the purchase intentions towards the sponsor brands. As predicted, a significant difference was found between the experimental groups in terms of their purchase intentions, $F(2,123) = 8.352$, $p < 0,001$. Purchase intentions were higher for participants in experiment 2, M = 3.42; SD = 1.07 than experiment 1, M = 3.04; SD = 1.16 and the control group, M = 2.49; SD = 1.02. Thus, the results support hypotheses 4: Purchase intentions towards sponsor brands that appear in an online computer game where participants select the sponsor brands before playing the game will be higher than when they do not select them.

As can be seen in table 5, all of the hypotheses were supported.

Table 5 Summary of results

Hypothesis	Result
H1: Participants will show better performance on an implicit memory measure (i.e. they will have higher word-fragment completion rates) for sponsor brands that appear in an online computer game where they select the brands before playing the game than when they do not.	Supported
H2a: Recall rates for sponsor brands that appear in an online computer game where participants select sponsor brands before playing the game will be higher than when they do not select them	Supported
H2b: Recognition rates for sponsor brands that appear in an online computer game where participants select sponsor brands before playing the game will be higher than when they do not select them	Supported
H3: Participants in an online computer game where participants select known sponsor brands before playing a game will not have more positive brand attitudes towards them compared to participants in an online computer game where they do not select the sponsor brands	Supported
H4: Participants in an online computer game where participants select sponsor brands before playing the game will have higher purchase intention scores for the brands compared to participants in an online computer game where they do not select the sponsor brands	Supported

5 Discussion

Findings of previous research have shown that recall and recognition rates of in-game advertisements are low when brands are embedded in games (Chaney et al., 2004; Lee and Faber, 2007; Nelson, 2002; Yang et al., 2006). Interactive games require players' visual attention and motor actions and they may therefore pay less attention to the brands that are placed as background features (Yang et al., 2006). Chaney et al., (2004) demonstrated that due to the immersion-factor, the higher the level of immersion (higher involvement), the higher the interference and the lower the memory of the brands in an online game. In this experiment, players showed better implicit memory for sponsor brands when they selected them before playing an online game, than for brands placed in the game they did not select themselves and when participants did not actually play the game (control group). Recall and recognition rates (explicit memory) were also significantly higher for game players who selected sponsor brands before playing the game, than those who only played the game with the embedded brands. Hypotheses 1 and 2 were supported, as there was a significant difference between the groups when it came to the implicit and explicit (both recall and recognition) memory of the sponsor brands.

There was not a significant difference between the groups when it came to the attitude towards the brands in the game. Hypothesis 3 which stated that participants in an online computer game who select sponsor brands before playing the game will not have more positive brand attitudes towards the brands than participants who do not select sponsor brands, was therefore supported. Mackay's et al. (2009) findings that participants demonstrated no improvement in their brand attitudes after exposure to the brand in a computer game might explain this research's findings, because it used known as opposed to made up brands, for which participants likely had pre-existing attitudes.

There was a significant difference between the groups when it came to purchase intentions towards the sponsor brands in the game. Hypothesis 4 which stated that participants in an online computer game who select sponsor brands before playing the game will have higher purchase intentions towards the sponsor brands compared to participants in the game who do not select them, was therefore supported. No studies

have been published that the results in this study could be compared to. Chaney et al., (2004) findings showed embedded billboards had a limited effect on product purchase intentions, due to the immersive nature of the games. Selecting sponsor brands before actually playing the game like was done in this experiment can therefore positively influence purchase intentions.

5.1 Contribution to research in marketing

This research is an important contribution to research in in-game advertising. No studies, measuring all the following mindset metrics in the same study on in-game advertising, seem to exist: memory of the brands (implicit and explicit), attitude towards the brands and purchase intentions.

Also, no studies seem to exist that measured the effects of in-game advertising when the game players selected sponsor brands before playing the game, or for that matter consequently whether the effects were greater than when they did not select them.

5.2 Implications for managers

Advertisers, game developers, and media agencies still have much to learn about the relatively nascent world of in-game advertising. It is important to understand how the content and structure of in-game advertising affects the way game players' process the brands in the games.

The results of this study could be of help to the online gaming industry when developing their games. When sponsor brands are selected by the game players before actually playing the game, game players' implicit and explicit memory and purchase intentions increase.

The results could also be of interest to advertisers and media agencies in terms of what type of in-game advertisements (as a marketing communication tool) they should spend their media budgets on.

5.3   Limitations and suggestions for future research

A possible limitation of this study is that the amount of time the game was played (i.e., 30 minutes) may not represent the average time people spend playing online football manager games. Players only played three rounds, and usually this particular online football manager game is played for at least ten rounds and with more interactivity.

The results of this study may be limited to university students. It should be noted that about 30% of the most frequent online game players are younger than 18 years old, and 19% of players are over 50 years old (ESA, 2005). Therefore, future studies could investigate the effect on other age groups as well.

More research is also needed, to confirm and expand the present study's findings. For example how in-game advertising influences experienced players' memory of sponsor brands, attitudes towards the brands, purchase intent, and so forth, since the gamers in the present study had relatively little prior online football manager game experience. It could also be of value to compare the long-term effects of in-game advertising. In relation to the type of game, it would be beneficial to replicate this research using different sporting or other games e.g. car racing games or first person shooter (FPS) games. Such studies would allow comparison with the current study, and conceivably increase the generalizability of its findings.

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Appendix 1: Questionnaire – game players

Dear Participant

This survey is a part of a Master's thesis in Marketing and International Business at the University of Iceland, on the subject of In-Game Advertising. The survey consists of 13 questions, and will take approximately 10 -15 minutes to complete. It is very important to answer <u>all</u> the questions to your best abilities, so please read and follow the instructions very well.

Thank you in advance.

Eloise Freygang
Master student, Marketing and International Business, HÍ
eaf2@hi.is

1. **In which experiment did you participate in?**

   □ Experiment 1

   □ Experiment 2

2. **2. Please complete the following words by filling in the blanks (e.g. Y_H_O for Yahoo).**

   _p_le

   B_t_o_

   _e_si

   _um_

   _oc_-_o_a

   _om_n_'s _iz_a

   _a_su_g

   _a_ls_erg

   Í_l_n_sba_k_

   _as_e_c_rd

   _i_e

   _i_ing

   _x_

   _ag_a_p

   _od_f_n_

3. **Please write down all the brands that remembered seeing in the Football Manager game that you just played.**

_____

_____

4. **Please select all the brands that you remember seeing in the Football Manager game that you just played.**

□ 1x2

□ OXO

□ Coca-Cola

□ Ladbrokes

□ Apple

□ Henson

□ Noatun

□ Icelandair

□ Kronan

□ Carlsberg

□ Nike

□ Nokia

□ Adidas

□ Ryan Air

□ Tesco

5. The following questions are about your opinion on the brands listed below. Please check the proper blank. (1= Strongly disagree, 4= Neutral, 7= Strongly agree).

Statements	Bad	1	2	3	4	5	6	7	Good
1. For me, the brand „Apple" is_____ to me.									
2. For me, the brand „Coca-Cola" is ____ to me.									
3. For me, the brand „Carlsberg" is _____ to me.									
4. For me, the brand „Nike" is _____ to me.									
5. For me, the brand „1x2" is _____ to me.									

Statements	Negative	1	2	3	4	5	6	7	Positive
1. For me, the brand „Apple" is_____ to me.									
2. For me, the brand „Coca-Cola" is ____ to me.									
3. For me, the brand „Carlsberg" is _____ to me.									
4. For me, the brand „Nike" is _____ to me.									
5. For me, the brand „1x2" is _____ to me.									

Statements	Worthless	1	2	3	4	5	6	7	Valuable
1. For me, the brand „Apple" is_____ to me.									
2. For me, the brand „Coca-Cola" is ____ to me.									
3. For me, the brand „Carlsberg" is _____ to me.									
4. For me, the brand „Nike" is _____ to me.									
5. For me, the brand „1x2" is _____ to me.									

6. **The following questions pertain to how likely you would purchase each of the brands listed below. Please check the proper blank consistent with your purchase intent.**

I intend to purchase products from the brand"_____" between now until Christmas. (1=Extremely unlikely; 4=Neutral ; 7=Extremely likely).

Brands	Extremely Unlikely	1	2	3	4	5	6	7	Extremely Likely
Apple									
Coca-Cola									
Carlsberg									
Nike									
1x2									

I intend to purchase products from the brand"_____" between now until Christmas. (1=Definitely False; 4=Neutral ; 7=Definitely True).

Brands	Definitely False	1	2	3	4	5	6	7	Definitely True
Apple									
Coca-Cola									
Carlsberg									
Nike									
1x2									

I intend to purchase products from the brand"_____" between now until Christmas. (1=Strongly disagree; 4=Neutral ; 7=Strongly agree).

Brands	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Apple									
Coca-Cola									
Carlsberg									
Nike									
1x2									

_____next page_____

7. Please mark Yes/No with the following statement:

It makes sense to me that these brands sponsor this type of game.

Brands	Yes	No
Apple		
Coca-Cola		
Carlsberg		
Nike		
1x2		

_____next page_____

Part VI

8. What is your gender?

	Male
	Female

9. Which age group do you belong to?

	18-25
	26-34
	35-44
	44 and older

10. How long have you been playing online games?

_____ years _____months

11. How many times a week do you play football manager games?

	0
	1
	2 – 3
	4 – 5
	> 5

12. What is the disposable income (**ráðstöfunartekjur heimilisins)** of your household per month (including student loans)?

	< 50.000
	50.001 – 100.000
	100.001 – 150.000
	150.001 – 200.000
	200.001 – 300.000
	>300.001
	Do not want to answer

13. Do you think you will play this Football manager game for a fee when it will be released?

	Yes
	No

14. Do you think you will play this online Football manager game for free when it will be released?

	Yes
	No

15. What is your nationality?

_____

16. In which school (department) of the University of Iceland are you?

□ School of Education

   □ School of Humanities

   □ School of Engineering and Natural Sciences

   □ School of Social Sciences

   □ School of Health Sciences

Thank you very much for your participation. If you have any additional comments please leave them in the comment box below:

………………………………………………………………………………………….

Dear participant

    This survey is a part of a Master's thesis in Marketing and International Business at the University of Iceland, on the subject of In-Game Advertising. The survey consists of 8 questions, and will take approximately 10 minutes to complete. It is very important to answer all the questions to your best abilities, so please read and follow the instructions very well.

    Thank you in advance.

    Eloise Freygang
    Master student, Marketing and International Business, HÍ
    eaf2@hi.is

1. **Please complete the following words by filling in the blanks (e.g. Y_H_O for Yahoo).**

   _p_l_

   B_t_o_

   _e_si

   _um_

   _o_a-_o_a

   _om_n_'s _iz_a

   _a_su_g

   _a_ls_erg

   Í_l_n_s_a_k_

   _as_e_c_r_

   _i_e

   _i_ing

   _x_

   _ag_a_p

   _o_af_n_

_____next page_____

2. **The following questions are about your opinion on the brands listed below. Please check the proper blank. (1= Strongly disagree, 4= Neutral, 7= Strongly agree).**

Statements	Bad	1	2	3	4	5	6	7	Good
1. For me, the brand „Apple" is_____ to me.									
2. For me, the brand „Coca-Cola" is _____ to me.									
3. For me, the brand „Carlsberg" is _____ to me.									
4. For me, the brand „Nike" is _____ to me.									
5. For me, the brand „1x2" is _____ to me.									

Statements	Negative	1	2	3	4	5	6	7	Positive
1. For me, the brand „Apple" is_____ to me.									
2. For me, the brand „Coca-Cola" is _____ to me.									
3. For me, the brand „Carlsberg" is _____ to me.									
4. For me, the brand „Nike" is _____ to me.									
5. For me, the brand „1x2" is _____ to me.									

Statements	Worthless	1	2	3	4	5	6	7	Valuable
1. For me, the brand „Apple" is_____ to me.									
2. For me, the brand „Coca-Cola" is _____ to me.									
3. For me, the brand „Carlsberg" is _____ to me.									
4. For me, the brand „Nike" is _____ to me.									
5. For me, the brand „1x2" is _____ to me.									

_____next page_____

3. **The following questions pertain how likely you would purchase each of the brands listed below. Please check the proper blank consistent with your purchase intent.**

I intend to purchase products from the brand"_____" between now until

Christmas. (1=extremely unlikely; 4=neutral ; 7=extremely likely).

Brands	Extremely Unlikely	1	2	3	4	5	6	7	Extremely Likely
Apple									
Coca-Cola									
Carlsberg									
Nike									
1x2									

I intend to purchase products from the brand"_____" between now until

Christmas. (1=Definitely False; 4=neutral ; 7=Definitely True).

Brands	Definitely False	1	2	3	4	5	6	7	Definitely True
Apple									
Coca-Cola									
Carlsberg									
Nike									
1x2									

I intend to purchase products from the brand"_____" between now until

Christmas. (1=Strongly disagree; 4=neutral ; 7=Strongly agree).

Brands	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Apple									
Coca-Cola									
Carlsberg									
Nike									
1x2									

_____next page_____

4. What gender are you?

	Male
	Female

5. Which age group do you belong to?

	18-25
	26-34
	35-44
	44 and older

6. What is the disposable income (**ráðstöfunartekjur heimilisins)** of your household per month (including student loans)?

	< 50.000
	50.001 – 100.000
	100.001 – 150.000
	150.001 – 200.000
	200.001 – 300.000
	>300.001
	Do not want to answer

7. What is your nationality?

_____

8. In which school (department) of the University of Iceland are you?

□ School of Education

□ School of Humanities

□ School of Engineering and Natural Sciences

□ School of Social Sciences

□ School of Health Sciences

Thank you very much for your participation.

Appendix 3: Questionnaire - clear short term memory

What is your favorite colour?

_____

What is your favorite fruit?

_____

Which sitcom character do you relate to the most?

_____

If you knew that this was your last day on earth, how would you spend it?

_____

If you were granted three wishes, what would they be?

_____

What would you do if you won the lottery?

_____