ABSTRACT

Advergaming serves as a new and valuable form of online advertising, especially for companies that target young consumers. This study examines the impacts of cognitive overload with placement prominence on respondents' brand recall, recognition and brand attitudes. An experiment was conducted on a group of university students with an exposure to an advergame under low and high cognitive load stimulus. Results showed that brands that are placed prominently are better recalled in high cognitive load condition. However, cognitive overload doesn't have any significant effect on the recognition of the main brand in which the advergames is specifically designed. Moreover, there is no difference in recall of subtly placed products in low and high cognitive load conditions. However, there is a significant difference in brand attitude in different cognitive loads. The study both investigated the context of advergames and as well in-game advertising (IGA) situations. The results of the study have both practical and theoretical implications.

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INTRODUCTION

Traditional advertising media are being replaced by new ways to communicate with the customers, and many companies are on game now. Consumers are engaged in a media that is focused on entertainment and this new form of advertising strategy is called branded entertainment. As a new form of branded entertainment (Wise, Bolls, Kim, Venkataraman & Meyer, 2008) advergaming can be defined as placing advertising messages, logos, and trade characters within games (Mallinckrodt & Mizerski, 2007). By the use of advergames, the companies can deliver their advertising messages through video games (Hernandez & Chapa, 2010). On the other hand, in game advertising (IGA), which is usually confused with advergames, is defined as inclusion of products within a digital game (Terlutter & Capella, 2013). There is a difference between advergames and IGA (Winkler & Buckner, 2006). In advergames the products or brands are given a prominent role within the online video game and they have an essential role in gaming experience (Hofmeister-Toth & Nagy, 2011). Most of the time advergames are made available to the consumers via websites and they are mostly free of charge (Grossman, 2005). On the other hand, IGA is the application of the product placement in advergames or in any other type of digital games, e.g. video games. They are sponsored paid placements in which the payment is done to the owner of the advergame. The difference between the general advergame environment and IGA can be seen in Figure 1 and 2.

The most challenging issue in the design of advergames is not knowing under which conditions advergames can be effective on consumer perceptions (Redondo, 2012). Therefore, understanding the effects of external stimuli like cognitive load on brand recognition and brand recall will provide important evidence about the issue. As brand placements in games have an interactive nature, playing advergames triggers cognitively involving experiences (Cauberghe & DePelsmacker, 2010). The cognitive resources that are available to the audience during message processing situations are called cognitive load (Grigorovici &

Figure 1. The advergame environment in Magnum Advergame
This study aims to define the possible effects of cognitive load on brand recall for both the main brands and the placed brands in advergames during game play experience.

Advergaming is a technique that offers extensive exposure to branded content. Besides its promotional benefits, the literature on consumer memory on advergames is limited (Hernandez & Minor, 2011). This study aims to investigate a cause-effect relationship between cognitive load and brand recall in the context of an advergame. Also, testing the effectiveness of advergames in terms of brand recognition and brand attitude are considered as fundamental issues and measures (An & Stern, 2011).

In this study an experimental design was used with the manipulation of cognitive load during gameplay. The subjects in the experiment group were given cognitive load objects during the game, and a recall test – which involves exposing to a stimulus – will be used to measure the brand recognition (main brand), brand recall (IGA brands) and brand attitude (main brand) of the subjects. The authors believe that this study will provide useful insights for both academicians and practitioners.

**BACKGROUND**

Advergames serve as a new medium especially in markets for younger audiences as they use internet and mobile technologies constantly and have a tendency to engage in online and interactive gaming (Santos, Gonzalo & Gisbert, 2007). Placing advertising messages in different media is not a new strategy. Before advergames, advertisers were still placing their advertising messages in movies, television programs and video games. This form of a hybrid advertising strategy is called *product placement*. An early definition of product placement by Balasubramanian (1994) is “a paid product message aimed at influencing audiences via the planned and unobtrusive entry of a branded product into a television program (movie or a video game).” Product placements are a good strategy to prevent the avoidance of the audience towards advertising messages. In the video game industry, the product placement strategies are mostly called “in-game advertising (IGA)”.

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*Figure 2. Example of IGA in Magnum Advergame*
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As the integration between product placement and media has evolved; a new form of promotional content called branded entertainment has emerged. Branded entertainment is defined by Hudson and Hudson (2006) as “the integration of advertising into the entertainment content; whereby brands are embedded into storylines of a movie, television program or other entertainment medium.” A new and growing form of branded entertainment is advergames. “Advergame” is a term that combines the words “advertising” and “video game” (Grossman, 2005). Advergames present a developing field within the online electronic games industry and are used to promote specific products and/or brands (Dahl, Eagle & Báez, 2009). With the interactivity (Lee, Park & Wise, 2014), entertainment (Martí-Parreño, Aldás-Manzano, Currás-Pérez & Sánchez-García, 2013) and with their viral component, advergames act as an important source in shaping consumers’ attitudes towards the brands they promote (Alina, 2013).

Previously academics and practitioners have defined advergames as a special form of IGA. The reason behind this conceptualization is most of the time the design and attributes around the main brand being promoted within the game evokes prominent product placement in video games. What is more, both IGA and advergames make use of the entertainment media. According to Winkler and Buckner (2006) there are differences between advergames and IGA. With IGA companies are basically buying space for their advertisements in games and within an advergame or any online game (An & Kang, 2014). Generally multiple brands are placed and promoted in video games (Yang, Roskos-Ewoldsen, Dinu & Arpen, 2006). On the other hand, an advergame is a digital game that is designed around a brand (Wise et al., 2008). To summarize, in IGA, a number of brands and products are embedded within the game; but in advergame, the game is specifically designed and created to promote a particular brand and the brand becomes the part of the entertainment that is created by the game (Terlutter & Capella, 2013; Winkler & Buckner, 2006).

Placement Prominence and Its Relation to Audience Responses in IGA and Advergames

The way of the placement occurs in a digital game may be critical in terms of achieving the desired brand awareness, attitude or purchase intentions. Placement prominence can be defined as “the extent to which the placement possesses characteristics designed to make the brand/product central focus of audience attention” (Gupta & Lord, 1998). IGA can be integrated into the game play in two ways: prominently or subtly (Terlutter & Capella, 2013). In prominent placement, the brand is visually and verbally placed with a longer duration and they are integrated with the storyline or the content (Gupta & Lord, 1998; Lee & Faber, 2007). In subtle placements brands are only visually made available to the audience without any integration with the medium (Gupta & Lord, 1998; Van Reijmersdal, Rozendaal & Buijzen, 2012).

Product placements can be used to achieve different cognitive, affective and conative responses like, increased brand awareness, brand recall and recognition, and to create desired changes in brand attitude and purchase intentions (Cholinski, 2012; Williams, Petrosky, Hernandez & Page, 2011). There is an expected difference between prominent and subtle placements in terms of audiences’ cognitive and affective responses. Most of the research on product placement considers the way the brands are placed in a medium to be associated with cognitive responses like brand recall and recognition (Gunawardena & Waiguny, 2014; Van Reijmersdal et al., 2012). Prominently placed brands are expected to be easily recalled and recognized (Gupta & Lord 1998; Lee & Faber 2007; Van Reijmersdal et al., 2012). The reason behind the higher levels of recall is associated with the high level of integration of the placement and the game (Chaney Lin & Chaney, 2004; Peters & Leshner, 2013). In a gaming environment, the
audience is highly focused and shows interest to the content. As a result, they process the environment more attentively (Cauberghe & DePelsmacker, 2010). When the product is not prominently placed, the expected level of recognition is lower (Lee & Faber, 2007). Like cognitive responses, affective responses like brand attitude are also expected to be different based on the placement prominence. There are conflicting opinions in literature in terms of these outcomes. Some studies suggest that prominent placements are expected to create a more negative affective response, as they are more visible to the audience and such placements are evaluated as intrusive (Kinard & Hatman, 2013; Shiv, Edell & Payne, 1997; Van Reijmersdal, 2009; Hernandez, Chapa, Minor, Maldonado & Barranzuela, 2004). Some other findings state that the placement of products in video games and advergames, when compared with other media like movies or television shows, receive a more positive attitude from the audience (Bellman, Kemp, Haddad & Varan, 2014; Williams, et al., 2011). In other studies, it is suggested that the advertising messages in a gaming environment are presented differently than other media, the players would ignore or not notice the persuasive elements embedded within the game (Raney, Arpan, Pashupati & Brill, 2003). The same situation also applies to advergaming environment.

As advergames become a more popular medium more research has been conducted on understanding and examining the possible outcomes of advergames. As in IGA, advergames also used to achieve certain results. Previous research concerning advergames, like studies on IGA, has focused on affective responses (Hernandez et al., 2004; Winkler & Buckner, 2006) and cognitive responses (Nelson, 2002; Gross, 2010; Hernandez & Minor, 2011; Lai & Huang, 2011; Cauberghe & DePelsmacker, 2010; Lee & Faber, 2007; Peters & Leshner 2013). Glass (2007) suggested that advergames present more favorable outcomes than IGA in non-branded games. Expected changes in attitudes and perceptions are created differently in an advergame due to their certain attributes like interactivity they provide (Kleeberger & Hummel, 2002).

Brands are embedded into an advergame in different ways. The first approach is the passive form of placement, which basically refers to the IGA applications. However, a distinct feature that advergames present is placing the brand as a major part of the game and allowing the gamers to interact with these placements. This type of product placement is an active form of placement (Nelson, 2002; Lee et al., 2014). Advergames are mostly used to create and enhance product awareness with engaging the gamer with the product or brand that is being promoted (Tina & Buckner, 2006). Previous research on the possible effects of interactivity suggest that as brands are associated with the gaming environment combined with a certain level of interactivity, gamers feel higher levels of involvement with the brand (Nelson, 2002) and also they create more positive attitudes towards the brand and the advergame (Goh & Ping, 2014; Sukoco & Wu, 2011; Hernandez, 2011). With their interactivity feature advergames enhance the value of brand advertisements, as they create control and communication between the medium and player (Ghirvu, 2011).

Another important feature of advergames is their entertainment aspect (Martí-Parreño et al., 2013). Entertainment received by playing an advergame induces a better gaming experience and this good experience results in higher levels of brand recall and positive attitude (Adis & Jun, 2013; Vermeir, Kazakova, Tessitore, Cauberghe & Slabbink, 2014). The interactivity and enjoyment provided by advergames makes them stronger than typical product placements and IGA (Cauberghe & DePelsmacker, 2010).

When compared to other forms and media used in typical product placements advergames also hold the difference in terms of duration and exposure. Unlike movies and television programs, gamers playing an advergame can be exposed to the advertising messages for longer periods and more than once (Waiguny, Nelson & Terlutter, 2012).
Cognitive Load and Multitasking Effects

Cognitive load theory, originated in the 1980s, is an instructional theory based on knowledge of human cognition (Sweller, Ayres & Kalyuga, 2011). Since its inception, it has used aspects of human cognitive architecture to generate experimental, instructional effects. As it was put by Kahneman (1973), and developed in the cognitive psychology, limited cognitive capacity theory posits that human attention and cognitive capacity is limited at any given time. Thus, the allocation of limited cognitive capacity influences the processing and outcomes of stimuli we encounter (Kahneman, 1973). In more detail, in the theory, it is stated that “one’s total attention capacity can be split into primary tasks and secondary tasks” (Kahneman, 1973; Lynch & Srull, 1982). The former is the spare capacity that has the second priority.

There are some conditions that cognitive resources are depleted and less capacity is left for further processing of information. Some examples of those conditions are; (1) high involvement (Klimmt & Vorderer, 2003), (2) multi-tasking (Paas, Renkl & Sweller, 2003; Sukoco & Wu, 2011), (3) presence of redundant information (Sweller, 2011; Moore & Rideout, 2007).

Klimmt and Vorderer (2003) differentiated between two levels of involvement; low and high. Following their argument, a highly involving environment consumes more of users’ cognitive resources, leaving less capacity for processing further messages. According to Lewis and Porter (2010) video game environments, which are very similar to online games, entail high cognitive load conditions because of users’ high involvement.

Another cognitive source depleting condition is multi-tasking. According to the cognitive load theory, participants seem to experience a cognitive overload when they are exposed to multi tasks at a given time. Having done two tasks simultaneously reduces their capacity to process information. Human cognitive architecture meets the requirement for high-element interactivity by its combination of working and long-term memory (Paas, et.al., 2003). Working memory, in which all conscious cognitive processing occurs, can handle only a very limited number—possibly no more than two—of interacting elements (Paas, et.al., 2003).

The third condition is the presence of redundant information. Redundant information is defined as any unnecessary information. Processing unnecessary information imposes an extraneous cognitive load (Sweller, 2011). Especially when the participants process the message, which mostly evokes their affective responses, their cognitive response could be reduced (Sukoco & Wu, 2011).

The advergames are presented in an environment that requires high engagement of the game player. In the study by Huh, Suzuki-Lambrecht, Lueck & Gross (2015), derived from the existing literature, some important characteristics of advergames offer explanations for advergames’ diminished cognitive effects compared to those of other media: (1) the higher interactivity of game play demanding more cognitive resources than viewing noninteractive media; (2) no fixed content structure or story line in advergames, demanding greater cognitive efforts from the game player to understand and learn the content; and (3) the multimodal, entertaining, and immersive nature of advergames diverting consumer attention from processing and remembering information (Buijzen, Van Reijmersdal & Owen, 2010; Nelson & Waiguny, 2012; Panic, Cauberghe & DePelsmacker, 2013; Verhellen, Oates, DePlasmacker & Dens, 2014; Waiguny, Nelson & Terlutter, 2014; Waiguny & Terlutter, 2011). Following limited cognitive capacity theory (Kahneman, 1973; Lang, 2000), it can be assumed that the more cognitive capacity devoted to achieve goals of the game, the less will remain to process in game advertisements.
The Moderating Impact of Placement Prominence on Cognitive Load

Stated by the cognitive overload studies, the split of information processing between different tasks creates an increased cognitive load while the tasks are competing for the attention (Rosen, 2008; Lee & Shen, 2009; Hernandez, 2011). Visual stimuli further increase the load as the player’s eyes switch between the different tasks (Brasel & Gips, 2011). As a result, stated by Hembrooke and Gay (2003), “due to higher cognitive load and divided attention, recall and recognition of specific content is often reduced.”

Although the previous discussion leads to the tentative assumption that when the cognitive load is high, the recall and recognition of the brands tend to be low, brand placement and cognitive load may interact in their effects on cognitive and affective outcomes. A study by Lee and Faber (2007) has demonstrated the effect of placement prominence on brand memory and attitudes in traditional brand placements. The majority of the previous research in traditional media found a positive relationship between placement prominence and cognitive variables as brand recall and recognition (Clark & Pavio, 1991; Brennan & Babin, 2004). Brennan and Babin (2004) found that visually prominent brands have the highest amount of recognition.

Inferring from the literature, it is argued that even with an increasing cognitive load, prominent placements are more effective than subtle placements. In high cognitive load condition, since there is limited capacity for the working memory, highly visible brands have a higher chance to be recognized by the player, thus the memory. As verified by Gunawardena and Waiguny (2014) subtle placements within the peripheral area of the movie will give rise to a greater decrease in recall and recognition than the prominent placements. On the other hand, subtle placement is not easy to discover in natural setting. Increasing the cognitive load on player will probably result in no change in cognitive responses in subtle placement condition. Combining the literature on cognitive load theory and placement prominence, the following hypothesis are proposed as the basis of the study:

H1: In prominent brand placement, high cognitive load results in a higher brand recall than low cognitive load condition.

H2: In subtle brand placement, there is no significant difference in brand recall between high cognitive load and low cognitive load condition.

H3: In high cognitive load condition, the recognition of the brand that the advergame is specifically designed will be higher, compared to low cognitive load condition.

Although, researchers have found that prominent placements generate higher brand recall and recognition than subtle placements (Gupta & Lord, 1998; Schneider & Cornwell 2002; Van Reijmersdal, 2009), some researchers argue that better recall does not necessarily improve attitude. There is evidence in the literature about the changes of brand attitude with the cognitive load. Yoon, Choi and Song (2011) demonstrated that, in movies, under conditions of high cognitive load, the player’s attitude towards a brand is more favorable. Therefore, the following is hypothesized:

H4: In high cognitive load condition, brand attitude is more positive than low cognitive load condition.
MAIN FOCUS OF THE CHAPTER

Issues, Controversies, Problems

Throughout the theoretical background section, it was stated that the cognitive overload is a working memory depleting process (Klimmt & Vorderer, 2003; Paas et.al., 2003; Sukoco & Wu, 2011; Sweller, 2011; Moore & Rideout, 2007). At a condition of overload, attention is directed primarily to the main task; in our case it is game play. All the remaining tasks are regarded as secondary thus has the second priority. In such a condition, it is expected that in game advertising is considered as the secondary, since the main task is to play the game in given directions. However, the question remains how the loaded working memory is influenced with an addition of new a condition, which is placement prominence. Reviewing the literature, it was found that on traditional settings, especially prominent placement has considerable impact on brand recognition and recall (Clark & Pavio, 1991; Brennan & Babin, 2004; Gunawardena & Waiguny 2014).

According to researchers, better recall does not necessarily improve attitude (Yoon, Choi & Song, 2011). Therefore, another question is the effect of cognitive overload on brand attitude toward the brand that the advergame is specifically designed for.

One another problem in the product placement literature is, advergames and IGA are mostly used interchangeably. However, they are two distinct terms. The main difference between these two concepts is the placement of the brand within the game. In the study, IGA and advergame are treated as two different concepts. The effectiveness of each is measured in terms of brand recall and recognition in the presence of cognitive overload.

To summarize, main focus of the study is to investigate the differences in terms of brand recall and recognition between subtle and prominent placements in a cognitive overload condition. Additionally, the effect of cognitive overload on brand attitude is studied.

The Study

To investigate the proposed hypotheses, a 2 (cognitive load (CL): high vs low load) by 2 (brand placement (BP): subtle vs prominent placement) experiment was conducted. Experiment was designed with a web-based casual online advergame to obtain a natural setting to ensure external validity. That’s because this type of casual games is usually played during leisure times.

The Method

Experimental Stimuli

It was decided to use an existing advergame. Although it is not possible to control all influencing factors, the advantage is; since participants are really playing the game, it adds real realism to the experiment (Waiguny, Nelson & Marko, 2013). After reviewing several advergames (e.g. Lego Speed Champions, Lego Star Wars, NASCAR - Hungry for Speed, T. Rowe&Price’s and Disney’s The Great Piggy Bank
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Adventure, MINI Maps: Google Maps Racing Advergame etc.), Magnum was selected for the experiment. It was available online at http://pleasurehunt.mymagnum.com/. The reasons for selecting Magnum were:

1. It was very easy to understand and play, does not require any skill.
2. There was a very easy challenge, which was collecting points by picking up small Magnum ice creams. At the same time, challenge inserted a cognitive load to the participant which was considered as the low-load condition.
3. It had 6 different in-game advertised brands, 3 of them were prominent placements, and 3 of them were subtle placements – these placements were determined with a pretest which was described below.

Subtle and prominent placements were determined based on the definition by Gupta and Lord (1998). In line with the definition of prominence, the brands were highly visible and the game character was in interaction with the brands. On the other hand, subtly placed brands were not very easy to perceive, although the brand name appeared on the screen. At the same time the interaction of the game character with the products was not much apparent contrary to the prominent placement. Still in order to be sure that the brands were perceived as subtly or prominently placed, a pretest with 10 respondents was conducted. After playing the game for 10 minutes -it is the duration of the real experiment- participants received a list of 6 brands, and asked whether they saw them in the game. The result revealed that 3 prominently placed brands (Samsung, Dove and Urbanears) had a mean score of M=3.49 (sd = 0.59), and 3 subtly placed brands (YouTube, Saab and Spotify) had a mean score of M=2.91 (sd = 0.67). When two means were compared t(9)=6.12, p<0.000, it was concluded that the placement prominence was successful.

Manipulation

In the study there were two levels of cognitive load; high and low. Advergames intrinsically insert cognitive load to the player (Huh, et.al, 2015; Mayer & Moreno, 2003). So, the advergame itself with no additional condition is considered as the low level cognitive load. Brünken, Plass and Leutner (2003) suggested the feasibility of the dual-task approach as a viable alternative to the most commonly used measure of cognitive load. In the study by Beilock and Ramirez (2011) students are forced to a secondary task as to memorize either two (low load) or six (high load) letters, to be loaded cognitively, as they solved math problems. Research has shown that remembering numbers can effectively manipulate cognitive load (Macrae, Hewstone, & Griffiths, 1993; Shiv, Britton, & Payne, 2004). Derived from the literature, to obtain high cognitive load condition, participants were asked to remember a 7-digit number while playing the advergame. This method was also applied by Lee and Shen (2009). Participants were instructed that they would be asked to write down the number later. So, a dual task approach was achieved.

Procedure

The experiment was conducted in a computer laboratory. Participants were seated in front of a computer screen and told that the game they would play was about an interactive lecture. Participants were assigned randomly to one of the 2 conditions (high or low cognitive load). There were two experimental sessions, one with high load condition and other with low load condition. Each experimental session was about 15 minutes. After they had been informed about the game, they were required to play the game for 10
minutes without any interaction with each other. There was always an instructor present throughout the experiment. After 10 minutes of game play, they were asked to fill an online questionnaire that measured average weekly internet use, gaming experience, gaming time, telepresence experience during play, brand recognition, brand recall and brand attitude.

**Preliminary Analysis**

**Sample**

100 students from several management courses were participated in exchange for an extra course credit. 54 of the respondents were subjected to secondary task while playing the game, keeping the 7-digit number in mind, by definition, considered as the high cognitive load condition. The remaining 46 were left to play the game only, considered as low cognitive load condition.

Sample consisted of 58 females (58%) and 42 males (42%). Average age was 22. Average weekly Internet use was more than 4 hours, gaming experience was 2.9 years and respondents were playing games more than 4 hours per week on average.

Since subjects’ gaming experience and their frequency of game play can affect brand recall (BRc), brand recognition (BRg) and brand attitude (Bra), prior to the analysis, it was required to be sure that groups were not different in terms of average weekly internet use, gaming experience and gaming time. To investigate similarities/differences between groups Pearson chi-square test was applied. According to the results, it was concluded that, the subjects in each group had the same characteristics in terms of their average weekly internet use ($\chi^2 = 4.19$, df=3, p=0.241), gaming experience ($\chi^2 = 6.758$, df=3, p=0.080) and frequency of game play ($\chi^2 = 0.125$, df=2, p=0.939).

**Covariate**

Because the experiment was held on a natural setting by asking the participants to play an existing online game; telepresence, which is known from existing advergames studies to influence BRg, BRc (e.g. Hernandez, 2011; Vermeir et.al., 2014) and BRa (Hernandez, 2011), was included as covariate in the analysis.

Novak, Hoffman, and Yung (2000) define telepresence as an antecedent of flow. It is defined as a feeling of being part of the environment created by the medium (Hoffman & Novak, 1996). In the study by Vermeir et.al (2014); it is stated that telepresence is a constituent element of flow that affects in-game advertising outcomes (Grigorovici & Constantin, 2004; Nelson, Yaros & Keum, 2006). In brief, telepresence is the feeling of being present in a particular situation. Telepresence increases as consumers engage with a medium that is highly interactive and vivid (Suh & Chang, 2006). In other words telepresence is related to the interactivity and vividness components of a technology (Steuer, 1992; Suh & Chang, 2006), and they both need to be present for the audience to feel a certain level of telepresence (Klein, 2003; Suh & Chang, 2006). In an advergame setting due to the certain characteristics of advergames like entertainment and interactivity, the gaming experience is expected to create a certain level of telepresence (Bellman et al., 2014; Klein, 2003). Cauberghe, Geuens, and De Pelsmacker (2011) suggest that the positive effects of brand attitude would increase the telepresence feeling of gamers. Previous studies state that in situations where consumers feel a certain level of telepresence in computer-mediated environments they tend to create a stronger belief towards products being promoted (Kim & Biocca, 1997; Klein, 2003; Suh & Chang, 2006). Telepresence also plays an important role in processing information.
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in a gaming environment. In higher levels of telepresence, felt by the gamers, their attention is highly allocated to game play and they tend to become more attentive to the information provided to them during game play (Besharat, Kumar, Lax & Rydzik, 2013).

Telepresence in online advergames is thought to occur when players mentally become a part of the game and forget about the real world. Thus, none of the groups in the study should go thorough more intense telepresence experience than the other. Telepresence during game play was measured using the scale adopted from Refiana, Mizerski, and Murphy (2005) consisting of 6 items measured on 5-point Likert scale (totally disagree to totally agree).

In another analysis, it was checked whether there were differences between the groups in terms of the telepresence experience. Telepresence of 6 items were calculated ($\alpha = 0.917$, $M=3.36$, $sd=0.037$). The mean score implies that the telepresence experience was only at an average level. At the same time, a one-way ANOVA between groups yielded no significant differences ($F=0.302$, $p=0.585$).

**Dependent Measures**

The dependent variables consisted of cognitive constructs for brand recognition (BRg), brand recall (BRc) and brand attitude (BRa). BRg was assessed by asking two questions: (1) Did you recognize that the game that you just played is designed for a specific brand? Yes/no. (2) Could you write down the brand that the game is designed for? Open-ended question with an empty text box under. To measure BRc, respondents were given the 6 brand names present in the game (Dove, YouTube, Spotify, Saab, Urbanears, Samsung). They were asked whether they could remember having seen them in the game. Each brand name had an option to be answered as either I saw or I didn’t see. Another dependent measure, BRa, was measured by a scale adopted from Batra and Ahtola (1991). Respondents were asked to indicate their degree of agreement about Magnum brand on how good, valuable, useful, wise and joyful the Magnum brand is. Responses were measured on 5-point Likert scale (totally disagree to totally agree).

**Findings**

**Brand Recall (BRc)**

As proposed in Hypothesis 1, we assume that the effect of cognitive load on brand recall for prominent placements would be higher in a high cognitive load situation. First, BRc for the prominently placed brands were calculated. The results indicated that prominent placements received a 64.7% recall ($M=4.0867$; $sd =0.39$). To test the hypothesis, we calculated a single factorial ANCOVA with cognitive load as the independent and BRc for prominent placement (BRc$_p$) as the dependent variable. Telepresence experience during game play served as a covariate. As expected there was a main effect of cognitive load on BRc$_p$ (BRc$_p$ in high cognitive load condition; $M=4.27$, $sd=0.39$ versus BRc$_p$ in low cognitive load condition; $M=3.87$; $sd=0.70$) in which the difference was significant ($F=6.165$, $p= 0.017$). As the results of the ANCOVA yielded a significant difference based on the degree of cognitive load our data succeeded in supporting hypothesis 1 (H1).

Next as theory on IGA suggests that there is either low or no difference in terms of BRc for subtle placements, we hypothesized that there will be no difference in terms of BRc for either high or low
cognitive load conditions. Before testing the hypothesis BRc for the subtly placed brands were calculated. The results indicated that subtle placements received a 48.7% recall (M=3.50; sd=0.64). To test the second hypothesis a second ANCOVA test was conducted using BRc for subtly placed brands (BRc_s) as the dependent, cognitive load as the independent variables, and again telepresence served as the covariate. As expected there was no main effect of cognitive load on BRc_s (BRc_s in high cognitive load condition; M=3.53; sd=0.72 versus BRc_s in low cognitive load condition; M=3.49; sd=0.72) in which the difference between two means was not significant (F=0.12; p=0.912). Although there is a slight difference in terms of means for high and low cognitive situations, the F-test wasn’t able to create statistically significant results. The results were consistent with the hypothesis 2 that was proposed. Consequently, hypothesis 2 (H2) was also supported. Another important finding according to the results is that percentage of BRc for prominently placed brands (68.7%) are relatively higher than percentage of subtly placed brands (48.7%).

The results for BRc also support the findings of previous studies about IGA in which relative differences were found according to placement prominence (Nelson, 2002; Cauberghe & DePelsmacker, 2010; Gunawardena & Waiguny, 2014). The difference between BRc for prominent and subtle placements is summarized in Figure 3.

**Brand Recognition (BRg)**

Hypothesis 3 investigates the effects of cognitive load on brand recognition (BRg) for the brand that the advergame was specifically designed for. The hypothesis proposed that in terms of high cognitive load the brand recognition will be higher compared to low cognitive load condition. To test the hypothesis BRg was used as the dependent and cognitive load as the independent variables, and telepresence was used as the covariate. Almost all of the subjects recognize the brand correctly with a percentage of 94%. A single-factorial ANCOVA was calculated which revealed cognitive load condition did not have any effect on brand recognition (BRg in high cognitive load condition; M=1.93; sd=0.27 versus BRg in low cognitive load condition, M=1.96; sd=0.21; F=0.116; p=0.735). Although there was a slight decrease in recognition when high cognitive load condition was introduced; results of the F-test were not statistically significant. As a result, the third hypothesis (H3) of the study was not supported.

*Figure 3. Effects of cognitive load on BRc for prominent and subtle placements for IGA*
Brand Attitude (BRa)

An analysis of covariance (ANCOVA) was carried out to test the fourth hypothesis of the study. The last hypothesis of the study suggests that in a high cognitive load situation the BRa for the brand that the advergame was specifically designed for will be more positive than low cognitive load condition. To test the hypothesis, we used cognitive load as the independent variable and BRa as the dependent variable. Same as the other hypothesis’ tests, telepresence was used as the covariate. As expected the BRa was more positive in a high level of cognitive load (BRa in high cognitive load condition; M =17.41; sd=2.96 versus BRa in low cognitive load condition M= 15.72; sd=2.34). The results of the ANCOVA have yielded a significant effect between the dependent and independent variables (F=4.466, p=0.028). According to the results hypothesis 4 (H4) was supported.

The findings of the study and the results of the hypotheses are summarized in Table 1.

Figure 4. Effect of cognitive load on BRg for the main brand that the advergame is specifically designed for.

Figure 5. Effect of cognitive load on BRa for the main brand that the advergame is specifically designed for.
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Table 1. Findings of the study

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Expected Outcome</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 Prominent placement x high cognitive load</td>
<td>Higher Brand Recall</td>
<td>Supported</td>
</tr>
<tr>
<td>H2 Subtle placement x cognitive load</td>
<td>No difference in Brand Recall</td>
<td>Supported</td>
</tr>
<tr>
<td>H3 High cognitive load during game play</td>
<td>Higher Brand Recall</td>
<td>Rejected</td>
</tr>
<tr>
<td>H4 High cognitive load during game play</td>
<td>More positive Brand Attitude</td>
<td>Supported</td>
</tr>
</tbody>
</table>

**SOLUTIONS AND RECOMMENDATIONS**

The primary aim of this study was to examine the effect of association between different degrees of cognitive load and brand prominence on players’ cognitive and affective responses to brands advertised in digital games and to the main brand. The study indicates that in high and low cognitive load conditions, placement prominence affects the brand recall of IGA, while brand recognition of the main brand is not affected. Moreover, level of cognitive load affects brand attitude toward the main brand.

The sample chosen for this study consists of university students, which is in line with previous research concerning advergames (Cauberghe & DePelsmacker, 2010; Gross, 2010; Okazaki & Yagüe, 2012; Paisley, 2013). The reason behind the use of university students as sample units is their engagement and interest in playing online games. Young players are the main target for branded entertainment.

**Cognitive Load and Brand Prominence**

One of the findings of the study is: prominently placed brands are better recalled in the presence of high cognitive load than low cognitive load.

According to the cognitive load theory, there is limited cognitive capacity of the human beings, and tasks are allocated based on the given priorities (Kahneman, 1973). After the primary tasks occupy the cognitive capacity, secondary tasks are taken into consideration (Lee & Shen, 2009; Hernandez, 2011). If the primary task has already depleted the capacity, no cognition left for the secondary task. In such a case, the findings of the previous studies suggested a reduced brand recall and recognition of specific content (Hembrook & Gay, 2003). Furthermore, according to Mayer and Moreno (2003), people in multimedia environments experience cognitive overload when dealing with the complexity of both text and pictorial presentations. With the introduction of a new condition, which was placement prominence, in this study, however, the results changed. In the study by Van Reijmersdal et al. (2012), it was found that brand prominence within the game positively influenced children’s recall and recognition of the advertised brand. There were similar findings in studies with adults (Gupta & Lord, 1998; Lee & Faber, 2007; Yang & Roskos-Ewoldsen, 2007).

To our knowledge, placement prominence in different levels of cognitive load is investigated for the first time. The findings of the study are in line with previous studies in placement prominence: the more prominently a brand is placed; the better the brand is recalled (Gupta & Lord, 1998; Lee & Faber, 2007; Yang & Roskos-Ewoldsen, 2007). However, when recall of the brand becomes the secondary task, the expectation is toward a lower recall and recognition of the brands embedded in the game (Hembrooke & Gay, 2003), which is IGA. One of the contributions of the study is to demonstrate the ability of placement prominence to reverse the case. If the brand is placed prominently, especially in high cognitive
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load condition, it is better recalled. It can be explained by the way the placed brands are treated within the game. Interaction of the game character with prominently placed brands is most probably the main reason for that they were recalled better although the player is cognitively loaded. Interactive characteristics of the gaming environment may have taken the attention to the prominently placed brands, while the player is in active use of the brand.

Another explanation could be the secondary task’s demand for more cognitive capacity. With an aroused cognitive capacity, players may be more careful about the gaming environment since they are trying to achieve a goal. While they are competing in the game, the brands, which were highly visible and have an interaction with the character that the player is directing, take their attention. On the other hand, since subtle placements are not easy to discover, degree of cognitive load does not make any difference for cognitive variables on players. In any way, examining the mean scores, it can be concluded that in any level of cognitive load, subtle placements are recalled better than average, but not as high as prominent placements.

Brand Recognition

This study showed no impact of cognitive overload on recognition of Magnum brand, which is called the ‘main brand’ that the advergame was specifically designed for. Regardless of the degree of cognitive load, players recognized the Magnum brand. It is the result of the finding that, there was no significant difference in high and low cognitive load conditions on brand recognition of Magnum.

The result showed the effectiveness of the advergames on cognitive variable, which is the recognition of the main brand. 94% of the respondents recognized the brand correctly. This finding also supported to previous finding of prominent placement. Since throughout the game, the game character is in interaction with the main brand, the result is not a surprise. The advergame is designed in such a way that Magnum brand was in the central focus of player’s attention. It can be said that it is the most prominently placed brand in the advergame.

Result on brand recognition supports the idea of the effectiveness of the advergames.

Brand Attitude

Brand attitude is an affective variable that was found to be influenced by the level of cognitive load in the study. Cognitive load leads to affective processing, in which brand recognition is not influenced but attitudes are.

Previous studies found a positive relationship between the association of a brand with an enjoyable experience and brand attitude. The interaction was suggested through spill-over effect (Grigorovici & Constantin 2004; Raney et al., 2003). Spill-over suggests that the effects of an appreciated context, such as interaction with the game, carry over the embedded commercial messages (Van Reijmersdal et al., 2012). Thus, the commercial message benefits from the positive feelings associated with the context.

In our condition, as the level of cognitive load on player was increased, the attitude toward the main brand became more positive. It may be due to the challenging nature of the advergame. The affective response of the player through the main brand becomes more positive, as the cognitive resources are used effectively. This is in line with the previous findings, as Yoon et al. (2011) demonstrated, in traditional marketing, under conditions of higher cognitive load, the viewer’s attitude towards a placed brand,
which is IGA, is more favorable. Another explanation could be the transfer of entertaining and positive experience to the brand.

The contribution of this study to the literature is providing the evidence for under high cognitive load the attitude toward not only the placed brands but also the main brand of the advergame is more positive in digital games.

Managerial Implications

The findings of the study lead to a number of managerial implications for advertising professionals. Advergames are designed specifically to promote a brand. In advergames, there may be advertisements of other brands, which are called IGA. Advergames and branded environments can be valuable vehicles for delivering brand related messages to especially younger audiences. They provide a certain amount of control for both advertisers and game developers.

The first implication for the professionals is the proven effectiveness of advergames both for the main brand and embedded brands. Although this study specifically designed to investigate the effect of cognitive load, the findings showed that whether in the presence or absence of the cognitive load, embedded brands are recalled by more than fifty per cent of the players, main brand is recognized by the majority of the players (94%), and brand attitude is positive toward main brand. All those findings have proven the success of the new form of branded entertainment.

Going for the details, the placement prominence of a brand in an advergame does influence the advertising effects in terms of brand recall, main brands’ recognition and brand attitude, especially in the different levels of cognitive load. This finding is also supported by previous research concerning advergames (Cauberghe & DePelsmacker, 2010)

Cognitive overload is usually created in the advergames by giving multiple instructions to the player or giving a time limit to play the game. It is recommended to the practitioners, even in the game conditions that created cognitive load on player, prominently placed brand that is embedded in the game in an interactive way will be recalled by the young targets. What is more, if there is multi-tasking, the brands will be better recalled, most probably because of aroused attention of the player. On the other hand, trying to embed the brands in the game invisibly, and in a way that is hard to discover will result in low recall rates both in high and low cognitive load conditions.

According to the results, practitioners should not be concerned about the possible negative effects of cognitive overload on brand recognition. Cognitive overload had no effect on recognition of the main brand in either degree; i.e. high or low.

It is among the results that, as players enjoy the game, those positive attitudes are transferred to the brand evaluation. Thus, selecting the target gamers carefully becomes the main issue. For example, in a study by Ozansoy Çadırcı, Sağkaya Güngör and Köse (2015), the gamers were divided into six different segments in which dormant gamers have the most positive attitude toward IGA. The results of this study, together with the literature (e.g. Wise, et.al), imply that carefully selecting the target players should be the main concern of advergamers, so that they should enjoy the game first. Besides entertainment factor, the relevance between the brand and the game is also an important aspect that affects consumer attitudes.

Advergames are designed to be entertaining and this study verified that advertisers are successfully creating favorable affective and cognitive responses with the new form of branded entertainment.
FUTURE RESEARCH DIRECTIONS

Advergames are rather a new, but highly effective marketing concept targeting young consumers. There are many different subjects that they can be studied. This study examines the effect of cognitive load on cognitive and affective responses to advergaming content. Besides contributions to marketing literature this study also has limitations, which provide further opportunities for future research. The first limitation of the study can be considered as the way the cognitive load was manipulated. Cognitive load was manipulated by forcing subjects to remember a seven-digit number. Another way to manipulate the cognitive load could be inherent to the game, such as giving multiple tasks that should be completed in the game. As a result, it can be assumed that for different manipulations of cognitive load the results may differ. Future research may discover various effects of cognitive load on brand recall and recognition. Also the setting and the nature of the sample also cause some limitations. University students were selected as subjects for an extra course credit. As the students were offered an extra credit they might have acted more cautious during the experiment. Applying an experiment for a larger group and with a real life setting, i.e. without any incentives, may provide further information. In this study telepresence was used as the covariate. Using different variables like game involvement, brand familiarity or general attitude towards advergames might yield further interaction effects. Another area of study could be comparing the effectiveness of IGA with the effectiveness of advergames. They can be compared in different mediums, e.g. tablets, mobile devices etc., which is another area for future research.

CONCLUSION

In conclusion we have identified the possible interaction effects of cognitive load on brand recall, brand recognition and brand attitude in an advergaming context. It was investigated that recall of the prominently placed brands differs in high and low cognitive load conditions. Also the results of the study revealed that for different levels of cognitive load there are differences between subtle and prominent placements. The effect of cognitive load on prominently placed brands is higher than its effect on subtly placed brands. This study demonstrates that the recognition of the main brand in an advergame is not affected by cognitive conditions. This finding suggests an important assumption on the effectiveness and success of advergaming content. When the audience interacts with the product or the brand, their recognition and recall of the brand cannot be negatively affected by external stimuli. Cognitive load also have a positive effect on brand attitude. The results of the study demonstrate the importance and effectiveness of advergames as a communication tool for both cognitive and affective responses.

REFERENCES


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**KEY TERMS AND DEFINITIONS**

**Advergames:** Mostly Internet-based video games which promote a certain brand, company or product.

**Brand Recall:** Brand recall is a component of brand awareness. The term refers to the ability of consumers remembering a certain brand name after the exposure of a promotional content.

**Brand Recognition:** Brand recognition is another component of brand awareness; which refers to the ability of consumers to recognize a certain brand over other ones in a marketplace.

**Branded Entertainment:** Branded entertainment is a new form of advertising. The term basically refers to the act of integrating an advertising message or a brand with other entertainment content with the use of media like TV shows, movies or video games (Also known as *Branded Content*).

**Cognitive Load:** Refers to the total amount of mental activity and allocation to a certain task or tasks simultaneously with the task at hand.

**In-Game Advertising:** Refers to the practice of placing product or inserting advertising content in video games.

**Product Placement:** Product placement is the inclusion of a branded product in different media like movies, TV programs or video games.