Putting Brands into Play:
How Player Experiences Influence the Effectiveness of In-Game Advertising

Laura Herrewijn
University of Antwerp
Sint-Jacobstraat 2
2000 Antwerp
Belgium
+32 3 265 56 69
laura.herrewijn@ua.ac.be

Karolien Poels
University of Antwerp
Sint-Jacobstraat 2
2000 Antwerp
Belgium
+32 3 265 55 87
karolien.poels@ua.ac.be

ABSTRACT

This study investigates the relationship that exists between the effectiveness of in-game advertising (IGA) and one specific context characteristic: player experiences during gameplay. Gaming is an active experience where a person is drawn into a virtual world and confronted with numerous emotions and experiences. It is argued that these player experiences might have an impact on how a player processes the game environment, including in-game ads. An experimental design was employed in which participants had to play an online computer game that contained in-game ads. Results show that manipulating player experiences had an effect on IGA effectiveness in terms of brand recognition and brand likeability, supporting the notion that player experiences are important context characteristics that have to be taken into account while studying the effectiveness of in-game advertising.

Keywords

Digital games, in-game advertising, advertising effectiveness, player experiences, game difficulty, online experiment

INTRODUCTION

Imagine two people, playing the same digital game. These players will not just engage in ready-made gameplay but will actively take part in the construction of their game experience by bringing their own desires, thoughts, feelings and meaning-making. Consequently, the digital game experience, including the emotional experience, of these two players will never be exactly the same. One player might experience a gaming episode as pleasant, while another is left with feelings of deep frustration. The question then is whether the different emotions and experiences a player encounters while playing

a game have an effect on the way he or she processes elements of the game world, including in-game advertisements?

In-game advertising (IGA) refers to the use of digital games as a medium for the delivery of advertisements. The last couple of years, IGA has developed into one of the fastest growing forms of advertising in terms of yearly spending and anticipated growth, mostly due to the increasing popularity of digital games and the large target audience that can be reached through this medium (Bardzell et al., 2008; Yankee Group, 2006). Yet, although in-game advertising is considered a "hot topic" among advertisers and media firms, academic research concerning the subject is still in its infancy (Bardzell et al., 2008). Therefore, the aim of this article is to contribute to the research on the effectiveness of IGA.

There is considerable evidence that advertising effectiveness in traditional media (e.g. print, radio and television) is influenced by several context characteristics, like the different emotions people encounter or the physical and social environment they are in while being exposed to an advertisement (Bronner et al., 2007; Moorman, 2003; Van Reijmersdal et al., 2010). Yet, research on the effects of context characteristics on advertising in digital games is still limited.

The present study therefore focuses on the relationship that exists between the effectiveness of in-game advertising and one specific context characteristic: player experiences during gameplay. Specifically, the goal is to get an insight in the way emotions and experiences while playing digital games influence player responses to in-game advertising. Digital games have the potential to evoke a wide array of general (e.g. pleasure, arousal) and more specific emotional experiences (e.g. frustration, competence) (Ermi & Mäyrä, 2005; Poels et al., 2009). Prior advertising research studying traditional media already showed that both the general (Pavelchak et al., 1988) and specific (Griskevicius et al., 2009) emotions people feel while watching an advertisement affect the way the audience responds to the advertisement. Consequently, emotional experiences might also exert an influence on the way people process elements in a digital game environment, including in-game advertisements.

To be able to test this, the current study employs a between-subjects experimental design. Participants were asked to play an online computer game that contained several advertisements (billboards). Previous studies indicated that the player experiences of people change whenever the difficulty of the game is altered (van den Hoogen et al., 2008).We therefore manipulated the difficulty of the game, resulting in three experimental conditions: people had to play either an easy, medium or hard game level. After playing the online game, we assessed two effectiveness measures: recognition and likeability of the in-game ad placements. By examining the impact of player experiences on the effectiveness of IGA, the study attempts to fill the gap in the academic literature on in-game advertising in general and on player experiences as context characteristics, more specifically.

PLAYER EXPERIENCES AS CONTEXT CHARACTERISTICS
It is already well-documented in advertising research studying traditional media that context characteristics, like the emotional experiences people encounter while being exposed to an advertisement, have an impact on the way people process the ad (Moorman, 2003). Research on the effects of context characteristics on advertising in digital games, however, is limited. This is surprising, as gaming is an active experience

where a person is drawn into a virtual world and potentially confronted with numerous emotions and experiences. Players have to concentrate to be able to successfully conclude certain tasks and face feelings of control, frustration, relief, euphoria, flow etcetera in the process (Ermi & Mäyrä, 2005; Klimmt et al., 2007; Poels et al., 2009; Sherry, 2004).

Traditional advertising studies already showed that the arousal level and pleasantness of an emotion people feel while encountering an advertisement affect the way they process the ad. For example, it has been documented that people have poorer recall and recognition of commercial content in highly involving and arousing contexts (Coulter & Sewall, 1995; Coulter, 1998; Norris & Colman, 1992). Moreover, when compared with people who are in a negative state of mind, people who are in a positive state of mind are proven to have a more positive brand attitude, a greater intention to try advertised products (Owolabi, 2009) and a better recall of message stimuli (Gardner, 1985) and brand names (Lee & Sternthal, 1999). Finally, people also react more positively to a salesperson who has conveyed positive feelings, and are willing to pay more for his products (Bronner et al., 2007; Puccineli, 2006).

Bearing this in mind, it is not unlikely that the state of mind people are in and the emotional experiences they encounter while playing a digital game, in a similar way, affect the way they observe and process the advertisements that are integrated into the game environment. We therefore argue that player experiences are important context characteristics that have to be taken into account when studying digital games and their effectiveness as an advertising medium. In the current study, the impact of three general emotions and three specific player experiences on the effectiveness of IGA were taken into account.

The general emotions concern the so-called "lower-order emotions" that might occur while playing digital games (Poels & Dewitte, 2006). Lower-order emotions are largely uncontrollable and spontaneous emotional reactions, like pleasure, arousal and dominance, traditionally referred to as PAD-dimensions (Mehrabian & Russell, 1974; Poels & Dewitte, 2006). The *pleasure* dimension refers to the pleasantness or enjoyment of a certain experience, and ranges from unpleasant to pleasant (Ravaja et al., 2005). The *arousal* dimension gives an indication of the level of physical and mental activation associated with the experience, and ranges from very excited or energised at one extreme to very calm or sleepy at the other (Ravaja et al., 2005). Finally, the *dominance* dimension concerns the feeling of control and influence over others and surroundings, and ranges from very dominant to very dominated (Gilroy et al., 2008). In a gaming context, it has already been demonstrated that different in-game events can lead to changes in these PAD-dimensions (Ravaja et al., 2005; van Reekum et al., 2004). For example, compared to positive game events, negative game events (e.g. failing to complete a certain objective) generally lead to lower levels of pleasure and dominance, and higher levels of arousal (Ravaja et al., 2005; van Reekum et al., 2004). Furthermore, former advertising research found that the different PAD-dimensions have an impact on the way people process advertisements and advertising effectiveness, making these emotional states highly relevant to this study (Morris et al., 2002; Newell et al., 2001; Poels & Dewitte, 2008).

The specific player experiences we take into account are challenge, competence and tension. Digital games often provide players with an activity that is goal-directed. Moreover, every game puts players to a certain *challenge*, which in combination with the skills of the player will determine whether the player is able to reach this goal (Poels et

al., 2009). When players fulfil a goal or master a specific skill, they will perceive a certain amount of *competence*: they will feel successful and skilful, which often evokes positive emotions like pride and euphoria (Poels et al., 2009). On the other hand, however, failing to reach these goals often leads to feelings of *tension*, like frustration, irritation and even anger (Klimmt et al., 2007; Poels et al., 2009).

Because we wanted to study the effects player experiences have on the effectiveness of IGA, it is important to know which factors can lead to variations in these player experiences. It has already been shown that the intensity of different player experiences can change whenever the *difficulty* of the game is increased from easy to medium to hard (van den Hoogen et al., 2008). For example, levels with a higher difficulty were found to mostly lead to higher levels of arousal and high arousal experiences like frustration and challenge. Easier levels on the other hand were found to mostly lead to lower levels of arousal and low arousal experiences like pleasure, dominance and competence. In the present study, we therefore manipulated the difficulty of the online computer game participants had to play and propose that this will have an effect on a multitude of player experiences. In the case of the particular game used in the experiment, we expect that compared to the more difficult game levels, the easier game levels will be less challenging and arousing, but also easier to master in a short amount of time, thus leading to more pleasure, dominance and competence and less tension.

Because higher levels of pleasure, dominance and competence will go together with positive emotional experiences (e.g. enjoyment, pride, euphoria), we expect people to experience more positive emotions in the easier levels. Furthermore, greater amounts of tension, challenge and arousal are expected to lead to negative emotional experiences in the case of the particular game used, because the levels with a higher difficulty were designed to be significantly harder to master in a short amount of time, potentially leading to negative experiences like frustration and irritation. Therefore, compared to easy levels, we expect people to experience less positive emotions, more negative emotions and more arousal in levels with a higher difficulty. In other game contexts, however, it is quite possible that arousal and challenge are associated with positive emotional experiences like enjoyment (e.g. when a satisfying balance between the challenges of the game and the skills of the player can be reached) (Grigorovici & Constantin, 2004).

EFFECTS OF PLAYER EXPERIENCES ON BRAND RECOGNITION AND BRAND LIKEABILITY

If the manipulation of game difficulty indeed leads to differences concerning the emotions and experiences of the player, we expect that the brand recognition and brand likeability of players will vary accordingly. In the following sections we formulate hypotheses concerning the effects of player experiences on brand recognition and brand likeability, and elaborate on how this might have an impact on the manipulation of game difficulty.

Effect on Brand Processing

Positive vs. negative experiences: hedonic contingency hypothesis
People who are playing digital games can be confronted with both positive and negative experiences. As already mentioned, traditional advertising studies showed that, compared to people who are in a negative emotional state, people who are in a positive emotional state have a better recall and recognition of message stimuli and brand names (Gardner,

1985; Lee & Sternthal 1999). The explanation for this effect is based on the *hedonic contingency theory* (Lee and Sternthal, 1999; Wegener et al., 1995). This theory states that people who are in a positive state of mind are interested in sustaining their positive emotional state. As a consequence, they will scrutinise the hedonic consequences of a particular action. This means that, compared to individuals who are in a negative state of mind, individuals who are in a positive state of mind will analyse persuasive messages more closely for their hedonic consequences, resulting in a more elaborate processing of information, and thus better recognition scores (Wegener et al., 1995).

Arousal and challenge: the limited capacity model of mediated message processing hypothesis

Game environments often present players with highly demanding, engaging and arousing experiences (Grigorovici & Constantin, 2004). Based on the *limited capacity model of mediated message processing* (Lang, 2000), we propose that this arousing and engaging character of digital games might have consequences for the effectiveness of in-game advertising. The limited capacity model states that a person's ability to process information is limited. Moreover, it has been shown that highly involving and arousing environments consume more of people's cognitive resources, resulting in people focussing their attention primarily on the most essential information and tasks at hand, while being distracted from secondary information (e.g. commercial content) (Grigorovici & Constantin, 2004; Klimmt & Vorderer, 2003; Lang, 2000). For example, in television and magazine advertising settings it has already been demonstrated that viewers have poorer recall and recognition of commercial messages in highly involving and arousing contexts (Coulter 1998; Coulter & Sewall 1995; Norris & Colman, 1992).

Because people may encounter varying levels of positive, negative and arousing experiences while playing digital games, we expect these theories to also apply in the case of in-game advertising. More specifically, because easier game levels are suggested to lead to more positive emotional experiences, less negative experiences and less arousal, we propose the following hypothesis:

H1: Compared to the more difficult game levels, the easier game levels will generate more elaborate brand processing and thus lead to a better recognition of in-game ad placements.

Effect on Brand Evaluation

Positive vs. negative experiences: spill-over hypothesis

In the case of brand evaluation, traditional advertising studies showed that people who are in a positive emotional state evaluate brands more positively compared to people who are in a negative emotional state (Owolabi, 2009). An explanation for this effect is offered by the *mood congruency model* (Bower, 1981). Bower (1981) found that a person's state of mind influences the person's judgment by increasing the accessibility of congruent thoughts. Positive feelings enhance persuasion by priming positive thoughts, while negative feelings prime negative thoughts. In an advertising context, various studies showed that a person's psychological response to the context spills over to his or her attitude towards the advertisement, influencing it in a similar direction (e.g. Aylesworth and MacKenzie, 1998; Goldberg and Gorn, 1987; Murry et al., 1992). This so-called *spill-over hypothesis* (e.g. Pavelchak et al., 1988; De Pelsmacker et al., 2002; Moorman et al., 2006) therefore proposes that when the context in which an advertisement is shown conveys positive feelings, the advertisement will also be evaluated positively (and vice

versa for negative feelings). In a similar way, we expect this theory to be relevant in the case of in-game advertising. More specifically, because we expect easier game levels to lead to more positive emotions and less negative emotions, we propose the following hypothesis:

H2: Compared to the more difficult game levels, the easier game levels will lead to a more favourable evaluation of the in-game ad placements and thus a higher brand likeability.

Player Experiences as Mediators

If the results of the statistical analyses indicate that increasing the difficulty of the game indeed manipulates several player experiences, and that this also has a significant effect on the brand effectiveness variables, we expect to find that several player experiences weaken and therefore mediate this relationship between game difficulty and brand effectiveness. Because it is uncertain which player experiences will turn out to be the main mediators in this study, we are unable to outline specific hypotheses concerning the mediation model (see *Figure 1*) at this time. Instead, we formulate the following research question:

RQ: Which player experiences can be considered as mediators of the effect of game difficulty on brand recognition and brand likeability?

To be able to answer this general research question, we will perform both simple and multiple mediation analyses.
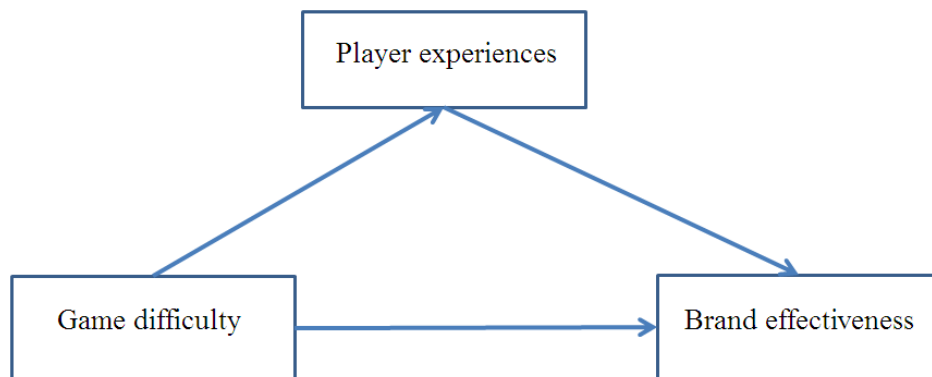

Figure 1. Mediation model.

METHOD

Materials

An online computer game, called *Flight of the Strihuhn* (Herrewijn & Ratarf Games, 2010), was developed for the purpose of this study. The game was a 2D platform game in which the principal character was a little bird who had to complete several tasks (e.g. collecting berries and balloons while avoiding obstacles) in order to beat its opponents and finish the game. Because we wanted to check how and to what extent player experiences influence the effectiveness of IGA, we manipulated the difficulty of the game, resulting in three experimental conditions: participants had to play either an easy, medium or hard level. Compared to the more difficult game levels, the easier levels

contained less obstacles, making it easier for the player to manoeuvre through the game environment.

Procedure

A total of 99 participants were recruited by placing invitations for the online experiment on several online forums (e.g. *9lives*, *ZGeek*) and social networking sites (e.g. *Facebook, Twitter*). Participants played the online game at home, without the presence of a researcher, which is advantageous for the external validity of the study. However, this also means we were not able to keep everything under control, like the size of the computer monitor the participants used to play the game and the amount of attention the participants devoted to the experiment. To keep variations in these variables to a minimum, the online game was always played in full screen mode and in the same display resolution (1024 x 768). The participants were also explicitly asked to concentrate on the experiment as much as possible. Additionally, we included some controls on our data, to check whether participants really played the game and filled out the questionnaires correctly. We were able to check the players' scores, how many times their character died in-game and whether they answered all the questions in a non-random way.

After downloading and starting the game, participants had to answer some questions concerning their socio-demographic (gender, age) and gaming characteristics (game frequency). Subsequently, the first phase of the experiment could start. This phase consisted of playing a neutral game level without in-game advertising. This first level was similar for all participants and its main goal was to explain the basics of the game.

Upon completion of the first level, participants were automatically and randomly assigned to one of the experimental conditions (easy, medium or hard game level). Apart from the difference in difficulty, these levels looked exactly the same. Each time, five billboards of fictitious brands were integrated into the background of the game. The choice to integrate fictitious instead of real brands was made in order to make sure that participants would not be influenced by their prior experiences with specific brands. The billboards included brands of shoes (*B&L*), a radio channel (*Radio Cirius*), a mobile phone (*iStar*), a soft drink (*Cuhna*) and a fast food chain (*MacBurger*) (see *Figure 2*).

These billboards were all about the same size and clearly visible and readable. During gameplay, players passed each billboard several times. After finishing the experimental level, participants had to rate their player experiences, followed by a questionnaire concerning their brand recognition and brand likeability towards the five brands shown in the game. On average, the experiment lasted about fifteen to twenty minutes.
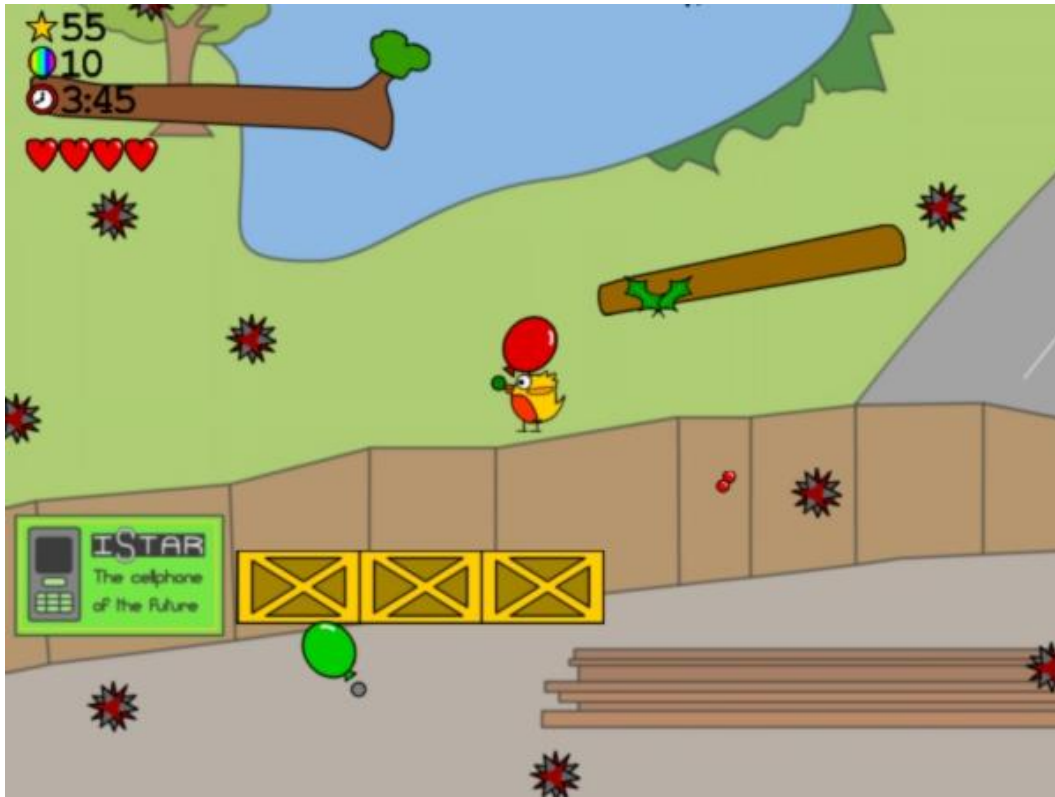
Figure 2. Screenshot of a billboard (*iStar*) in the online computer game *Flight of the Strihuhn*.

Participants

A total of 99 players (79 male, 20 female) participated in the experiment. Every experimental group contained 33 participants. The age of the participants varied between 16 and 50 years old, with an average age category of 21 to 30 years old (16 to 20 years old: 18.2% - 21 to 30 years old: 58.6% - 31 to 40 years old: 17.2% - 41 to 50 years old: 6.1%). 77.8% of the participants played digital games less than fifteen hours per week, 22.2% of the participants played fifteen hours or more. The random assignment of the participants to the experimental groups made sure that the composition of the easy, medium and hard group did not differ significantly concerning their socio-demographic and gaming characteristics (*gender* (χ^2 (2, N = 99) = .125, *NS*), *age* (χ^2 (6, N = 99) = 4.017, *NS*) and *game frequency* (χ^2 (2, N = 99) = .666, *NS*)).

Measures

General emotions. The general emotions of the participants were measured by using the Self-Assessment Manikin (Lang, 1980). The SAM method is based on the PAD-dimensions (Mehrabian & Russell, 1974) and uses three nine-point visual scales on which participants have to indicate how much pleasure, dominance and arousal they felt while playing the computer game. This method is being used and has been validated in both advertising (Morris, 1995; Morris et al., 2002) and gaming research (Chanel et al., 2008; van den Hoogen et al., 2008, 2009).

Specific player experiences. The specific player experiences were measured by asking participants to fill out the in-game Game Experience Questionnaire (iGEQ) (IJsselsteijn

et al., 2008). The iGEQ measures specific player experiences that consist of two statements to which agreement is measured on a five-point intensity scale ranging from 0 ("not at all") to 4 ("extremely"). These components include the dimensions of *competence* ("I felt successful", "I felt skilful"; $r = .78$, $p < .001$), *challenge* ("I felt challenged", "I felt stimulated"; $r = .71$, $p < .001$) and *tension* ("I felt frustrated", "I felt irritable"; $r = .78$, $p < .001$). The iGEQ has been used in several gaming studies and is of sufficient quality to accurately report game-play experience (Gajadhar et al., 2009; Nacke et al., 2010).

Effectiveness measures. The brand recognition of the participants was measured on three levels. First, the recognition questionnaire presented participants with a list of product categories, next with a list of brand names and eventually with a list of the pictures of the integrated billboards. Every time, participants had to indicate which categories, brand names and billboards they remembered encountering in-game. The data that originated from this questionnaire were combined into three recognition variables: $rec_{product}$, rec_{brand} and $rec_{billboard}$. These variables indicate how many product categories ($rec_{product}$), brand names (rec_{brand}) and billboards ($rec_{billboard}$) each participant correctly recognised.

To assess the brand likeability of the participants, they were asked to indicate how positively they perceived the five integrated brands by means of five-point Likert scales ranging from 0 ("strongly disagree") to 4 ("strongly agree"). The data that originated from this questionnaire were combined into one variable: $Brand_{like}$. This variable is an indication of the mean likeability of each participant towards the five brands (Cronbach's Alpha = .71). The term "brand likeability" is used instead of "brand attitude", because the experiment incorporates fictitious instead of real brands. Therefore, it is possible that the players' attitudes towards the integrated brands were affected by their attitudes towards the generic products (e.g. fast food chain).

RESULTS

Effects of Game Difficulty on Player Experiences

It was expected that manipulating *game difficulty* would have a significant impact on the experiences of the players. To check if this was the case, one-way ANOVAs were conducted with the general and specific player experiences as dependent variables (DVs) and the level of difficulty of the game as the independent variable (IV) (see *Table 1*). These analyses showed that the differences between the conditions were significant for all player experiences.

Table 1. Table of means and one-way ANOVAs with the player experiences as the DVs and game difficulty as the IV.

Difficulty		Pleasure	Arousal	Dominance	Competence	Tension	Challenge
Easy (1)	Mean	5.52	3.06	5.27	1.95	.71	1.03
	P.H.T.	*2, ***3	***3	*2, ***3	*2, ***3	*2, ***3	*2, ***3
Med (2)	Mean	4.55	3.94	4.03	1.41	1.29	1.52
	P.H.T.	*1, *3	*3	*1, *3	*1, *3	*1, *3	*1
Hard (3)	Mean	3.61	5.15	2.88	.85	1.91	1.95
	P.H.T.	***1, *2	***1, *2	***1, *2	***1, *2	***1, *2	***1
$F(2, 96)$		12.87***	12.21***	12.94***	12.17***	12.65***	10.28***

Note.   * $p < .05$, ** $p < .01$, *** $p < .001$
        P.H.T. = Post Hoc Tests (Tukey).

In general, the results of the analyses demonstrate that, compared to the more difficult levels, the easier levels indeed led to higher levels of *pleasure* ($F(2, 96) = 12.87$, $p < .001$), *dominance* ($F(2, 96) = 12.94$, $p < .001$) and *competence* ($F(2, 96) = 12.17$, $p < .001$), and to lower levels of *arousal* ($F(2, 96) = 12.21$, $p < .001$), *tension* ($F(2, 96) = 12.65$, $p < .001$) and *challenge* ($F(2, 96) = 10.28$, $p < .001$). Thus, the variations in player experiences between the levels were in line with our expectations.

Effects of Game Difficulty on Brand Recognition and Brand Likeability

By altering the difficulty of the game, six player experiences were thus successfully manipulated. To check which effects these player experiences really have on brand recognition and brand likeability, first of all, the influence of *game difficulty* on the effectiveness variables had to be analysed. Again, tables of means and one-way ANOVAs were conducted with brand recognition ($rec_{product}$, rec_{brand} and $rec_{billboard}$) and brand likeability ($brand_{like}$) as the DVs and game difficulty as the IV (see *Table 2*).

Table 2. Table of means and one-way ANOVAs with brand recognition and brand likeability as the DVs and game difficulty as the IV.

Difficulty		$Rec_{product}$	Rec_{brand}	$Rec_{billboard}$	$Brand_{like}$
Easy (1)	Mean	1.39	1.15	2.55	2.15
	P.H.T.	*2, ***3	***3	**2, ***3	*3
Med (2)	Mean	.85	.73	1.73	2.04
	P.H.T.	*1		**1, *3	
Hard (3)	Mean	.36	.33	1.03	1.81
	P.H.T.	***1	***1	***1, *2	*1
$F(2, 96)$		10.30***	7.56***	15.22***	3.01°

Note.   ° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$
        P.H.T. = Post Hoc Tests (Tukey).

These analyses showed that the experimental groups differed significantly concerning $rec_{product}$ ($F(2, 96) = 10.30$, $p < .001$), rec_{brand} ($F(2, 96) = 7.56$, $p < .001$) and $rec_{billboard}$

($F_{(2, 96)} = 15.22$, $p < .001$). The results demonstrated that, compared to the more difficult levels, the easier levels led to a better brand recognition, confirming **H1**.

Finally, the differences between the groups concerning *brand_like* were marginally significant ($F_{(2, 96)} = 3.01$, $p = .054$). The Post Hoc results of these analyses showed that, although in general the differences between groups were only marginally significant, the easy level did lead to a significantly more favourable brand likeability ($p < .05$) compared to the hard level, confirming **H2**.

Next, we checked for correlations between all player experiences, and between the player experiences and the brand effectiveness variables (see *Table 3*). This correlation matrix showed that several player experiences are interrelated, that some of the player experiences (especially *pleasure*, *dominance* and *competence*) are related to brand recognition, and that brand likeability is only related to *pleasure*.

Table 3. Correlation matrix of all player experiences and brand effectiveness variables.

	Pleasur	Dominan	Arousal	Compet	Tension	Challen	Rec$_{product}$	Rec$_{brand}$	Rec$_{billb}$	Brand$_{like}$
Pleasur	1.00	0.54***	0.08	0.44***	-0.47***	0.04	0.29**	0.25*	0.33**	0.26*
Dominan	0.54***	1.00	-0.07	0.51***	-0.49***	-0.14	0.27**	0.21*	0.35***	0.02
Arousal	0.08	-0.07	1.00	0.08	0.21*	0.57***	-0.06	-0.06	-0.21*	0.03
Compet	0.44***	0.51***	0.08	1.00	-0.34***	0.05	0.35***	0.33**	0.38***	0.08
Tension	-0.47***	-0.49***	0.21*	-0.34***	1.00	0.21***	-0.15	-0.14	-0.21*	0.01
Challen	0.04	-0.14	0.57***	0.05	0.21*	1.00	-0.07	-0.06	-0.11	0.11
Rec$_{product}$	0.29**	0.27**	-0.06	0.35***	-0.15	-0.07	1.00	0.70***	0.71***	0.20*
Rec$_{brand}$	0.25*	0.21*	-0.06	0.33**	-0.14	-0.06	0.70***	1.00	0.64***	-0.01
Rec$_{billb}$	0.33**	0.35***	-0.21*	0.38***	-0.21*	-0.11	0.71***	0.64***	1.00	0.09
Brand$_{like}$	0.26*	0.02	0.03	0.08	0.01	0.11	0.20*	-0.01	0.09	1.00

*Note. * $p < .05$, ** $p < .01$, *** $p < .001$*

Effects of Player Experiences on Brand Recognition

Finally, to determine whether the different player experiences (and which of the experiences) mediate the relationship between *game difficulty* and brand effectiveness (and thus answer our **RQ**), we conducted a series of simple mediations using Preacher & Hayes' (2008) bootstrapping methodology for indirect effects (see *Table 4*). Results of these simple mediation tests showed that only *competence* was able to significantly weaken the relationship between *game difficulty* and *rec_product*, *rec_brand* and *rec_billboard*. *Pleasure* was also able to greatly diminish the effect of *game difficulty* on *brand_like*, although the effect of *pleasure* on *brand_like* was not significant.

Table 4. Simple mediation analyses with the brand recognition variables as the DVs, game difficulty as the IV and the player experiences as the mediators (only (marginally) significant results are included) (n = 99, 5000 bootstrap samples).

DV	IV	R^2	B	$t(98)$	BCa 95% CI	
					Lower	*Upper*
$Rec_{product}$	**Diff_M**	.21***	-.43	-1.88		
	Diff_H		-.80	-3.20		
	Competence		.21	2.03	**-0.32**	**-0.01**
Rec_{brand}	**Diff_M**	.17***	-.42	-2.02		
	Diff_H		-.62	-2.65		
	Competence		.18	1.94	**-.30**	**-.001**
$Rec_{billboard}$	**Diff_M**	.27***	-.68	-2.45		
	Diff_H		-1.24	-4.10		
	Competence		.25	2.00	**-0.37**	**-0.10**
$Brand_{like}$	**Diff_M**	.09*	-.05	-.34		
	Diff_H		-.21	-1.38		
	Pleasure		.06	1.68	-.19	.002

Note.   * $p < .05$, ** $p < .01$, *** $p < .001$
Game difficulty was divided into 3 dichotomous variables: Difficulty_Easy (Diff_E), Difficulty_Medium (Diff_M) and Difficulty_Hard (Diff_H). Diff_E is the reference variable.
BCa 95% CI = Bias Corrected and Accelerated Bootstrapping Confidence Intervals. Confidence intervals containing zero are interpreted as not significant.

Subsequently, we used the non-parametric bootstrapping procedure for multiple mediation (see *Table 5*). These multiple mediation tests confirmed that *competence* was a partial mediator of the relationship between *game difficulty* and *rec_product* and *rec_billboard*. The effect of *pleasure* on the relationship between *game difficulty* and *brand_like* remains the same as in the simple mediation tests, because *pleasure* was the only player experience that significantly correlated with *brand_like* (see *Table 5*).

Table 5. Multiple mediation analyses with the brand recognition variables as the DVs, game difficulty as the IV and the player experiences as the mediators (n = 99, 5000 bootstrap samples).

DV	IV	R^2	B	$t(98)$	BCa 95% CI	
					Lower	*Upper*
Rec$_{product}$	**Diff_M**	.21***	-.41	-1.71		
	Diff_H		-.75	-2.76		
	Pleasure		.04	.56	-.21	.07
	Dominance		-.001	-.01	-.17	.15
	Competence		.19	1.68	**-.35**	**-.001**
	Total				-.35	.01
Rec$_{brand}$	**Diff_M**	.17**	-.42	-2.02		
	Diff_H		-.60	-2.37		
	Pleasure		.04	.57	-.19	.08
	Dominance		-.02	-.41	-.10	.20
	Competence		.18	1.75	-.32	.002
	Total				-.33	.05
Rec$_{billboard}$	**Diff_M**	.30***	-.55	-1.78		
	Diff_H		-.95	-2.35		
	Pleasure		.09	1.03	-.36	.05
	Dominance		.05	.78	-.30	.07
	Arousal		-.08	-1.09	-.27	.03
	Competence		.24	1.69	**-.40**	**-.001**
	Tension		.15	1.14	-.03	.30
	Total				-.63	.04

Note.   * $p < .05$, ** $p < .01$, *** $p < .001$
Game difficulty was divided into 3 dichotomous variables: Difficulty_Easy (Diff_E), Difficulty_Medium (Diff_M) and Difficulty_Hard (Diff_H). Diff_E is the reference variable.
BCa 95% CI = Bias Corrected and Accelerated Bootstrapping Confidence Intervals. Confidence intervals containing zero are interpreted as not significant.

DISCUSSION AND CONCLUSION

Prior advertising research studying classical media (e.g. print, radio and television) has shown that the context in which an advertisement is presented can have an influence on how the message is processed by the audience (Moorman, 2003). The emotions people encounter and the state of mind they find themselves in while being exposed to an advertisement are very important aspects of this context (Bronner et al., 2007; Van Reijmersdal et al., 2010). Yet, although advertising studies acknowledge the importance of context effects on the effectiveness of advertising in traditional media, research concerning the effects of context characteristics on the effectiveness of advertising in digital games is limited.

Therefore, the aim of this article was to focus on the relationship that exists between the effectiveness of in-game advertising and one specific context characteristic: *player experiences during gameplay*. Playing digital games has the potential to evoke numerous emotions and experiences, which might have an impact on the way players respond to in-game advertising. To be able to test the effect of player experiences on the effectiveness of IGA, a between-subjects experiment was employed in which participants had to play an online computer game that contained several advertisements. The difficulty of the game was manipulated, which was expected to affect several general and specific player experiences, theoretically also leading to differences concerning brand recognition and brand likeability.

First of all, the study analysed the influence of game difficulty on the player experiences. The results of these analyses showed that all player experiences varied between the conditions, meaning that our manipulation had been effective. Easier levels led to higher amounts of pleasure, dominance and competence and to lower amounts of arousal, tension and challenge. This means that participants in the easier levels experienced more positive emotional experiences, less negative emotional experiences and less arousal. Subsequently, the impact of game difficulty on the brand recognition and brand likeability of participants was examined. The results of the analyses showed that, compared to the more difficult levels, easier levels led to a more positive brand recognition and brand likeability. These findings seem to be in line with the spill-over, hedonic contingency and limited capacity model hypotheses that were formulated.

Because the results demonstrated that variations in game difficulty manipulated a multitude of player experiences and led to differences in brand recognition and brand likeability, mediation analyses were conducted. These mediation analyses showed that particularly competence was able to significantly weaken the relationship that existed between game difficulty and brand recognition. These results seem to provide support for the hedonic contingency hypothesis, with competence evoking positive emotions like pride and euphoria, leading to a positive effect on brand processing (Lee & Sternthal, 1999; Wegener et al., 1995). An additional explanation may be that, if people are better at playing a game, more of their attention can be devoted to the surroundings (e.g. billboards). This may also be related to the limited capacity model of mediated message processing (Lang, 2000), which predicts that more experienced (and thus competent) players utilise fewer cognitive resources when playing digital games because the mental and motoric actions they need to perform in order to complete the goals of the game eventually become automatic (Lang, 2000; Lemon, 2006).

An explanation for the strong mediating effect of competence may be that competence was the dimension most closely related to our manipulation of game difficulty. By

increasing the difficulty of the game, our goal was to make it harder for people to achieve their goals and complete their tasks, most and foremost manipulating competence, but also related experiences like tension, dominance and pleasure.

Finally, the results of the mediation tests also demonstrated that the player experience of pleasure was also able to greatly diminish the effects of game difficulty on brand likeability. However, the effect of pleasure on brand likeability could not be proven significant. This means we were not able to provide conclusive support for our spill-over hypothesis. Nevertheless, the impact of pleasure on the effectiveness of IGA, and more specifically on brand likeability, is an area worth exploring in future studies.

The reason for the low number of significant mediation effects in this study may lie in the fact that by altering the difficulty of the game, a wide array of (mostly interrelated) player experiences were manipulated. This way we were able to get an overall picture of the impact of player experiences, but the specific effects of the dimensions could not be fully analysed yet. The challenge for future research therefore lies in finding ways to manipulate the different dimensions separately, in order to be able to examine their specific effects.

Another limitation of the study is that the attention of the participants could not be measured while playing the game. In future research, it is thus important to determine the amount of focus each player is placing on the activity and elements of the game environment, to be able to measure the effectiveness of IGA in greater detail.

Furthermore, several limitations can be formulated concerning the design of the current study. The choice to develop a 2D casual game was made in order to be able to exert a large amount of control regarding the structuring of the gameplay, the integration of the billboards and questionnaires in the game etcetera. However, a lot of different game genres exist, and each genre possibly affects the emotions of the player differently. For example, 2D casual games are mostly lowly immersive, which raises the question whether highly immersive games affect player emotions and the effectiveness of in-game advertising differently. Therefore, although the current study provides a better insight in the way player experiences influence the effectiveness of IGA, we cannot claim that our results apply to all game genres.

Finally, the emotional reactions of the players were measured retrospectively by using self-report questionnaires. This way we were not able to assess the players' experiences while they were actually playing the game.

These limitations need to be tackled in future research in order to get a more detailed picture of the impact of context characteristics, such as player experiences, on the effectiveness of in-game advertising.

Summarised, the study illustrates that manipulating player experiences has an effect on the way people process in-game advertising, supporting the notion that the emotional experiences players encounter while playing games are important context characteristics that have to be taken into account while studying the effectiveness of in-game advertising. The findings of this study might offer valuable insights and create new possibilities for both the gaming and in-game advertising industry. For example, advertisements could be incorporated in digital games while taking into account the specific context of the placement and anticipating the emotional experiences of gamers.

Because the player experience of competence proved to have the strongest effect in the current study, in order to maximise brand recognition, it would be advisable for advertisers to integrate advertisements on moments in the game scenario when the player is feeling very competent and skilful (e.g. right after he has been able to successfully achieve a certain goal, kill a boss character etcetera, evoking positive emotions like pride), while avoiding moments when the player is feeling all but successful (e.g. when the player character is being overwhelmed by superior foes, losing a race,…).

ACKNOWLEDGEMENTS

REFERENCES

Aylesworth, A. B. and MacKenzie, S. B. "Context Is Key: The Effect of Program Induced Mood on Thoughts about the Ad", in Journal of Advertising vol. 27, no. 2 (1998), pp. 17-31.

Bardzell, J., Bardzell, S. and Pace, T. (2008) "Player Engagement and In-Game Advertising". Available at http://www.onetooneinteractive.com/wp-content/uploads/2009/07/otoinsights_in-game_ad_report.pdf (accessed November, 2009).

Bower, G. H. "Mood and Memory", in American Psychologist vol. 36, no. 2 (1981), pp. 129-148.

Bronner, F. E., Bronner, J. R. and Faasse, J. "In the Mood for Advertising", in International Journal of Advertising vol. 26, no. 3 (2007), pp. 333-356.

Chanel, G., Rebetez, C., Bétrancourt, M. and Pun, T. "Boredom, engagement and anxiety as indicators for adaptation to difficulty in games", in Proceedings of the 12th international conference on Entertainment and media in the ubiquitous era (2008), pp. 13-17, Tampere, Finland.

Coulter, K. S. and Sewall, M. A. "The Effects of Editorial Context and Cognitive and Affective Moderators on Responses to Embedded Ads", in Kardes, F. R., and Sujan, M. (Eds.) "Advances in Consumer Research" (1995), pp. 177-183. Provo, UT: Association for Consumer Research.

Coulter, K. S. "The effects of affective responses to media context on advertising evaluations", in Journal of Advertising vol. 27, no. 4 (1998), pp. 41-51.

De Pelsmacker, P., Geuens, M. and Anckaert, P. "Media context and advertising effectiveness: the role of context style, context quality and context-ad similarity", in Journal of Advertising vol. 31, no. 2 (2002), pp. 49 -61.

Ermi, L. and Mäyrä, F. "Fundamental components of the gameplay experience: Analysing immersion", in de Castell, S. and Jenson, J. (Eds.) "Changing Views: Worlds in Play" (2005), pp. 15-27. Selected papers of the 2005 Digital Games Research Association's Second International Conference.

Gajadhar, B. J., de Kort, Y. A. W. and IJsselsteijn, W. A. "Rules of engagement: influence of co-player presence on player involvement in digital games", in International Journal of Gaming and Computer-Mediated Simulations vol. 1, no. 3 (2009), pp. 14-27.

Gardner, M. P. "Mood States and Consumer Behavior: A Critical Review", in Journal of Consumer Research vol. 12 (December 1985), pp. 281-300.

Gilroy, S. W., Cavazza, M., Chaignon, R., Mäkelä, S., Niranen, M., André, E., Vogt, T., Urbain, J., Seichter, H., Billinghurst, M. and Benayoun, M. "An Affective Model of User Experience for Interactive Art", in Proceedings of the 2008 International Conference on Advances in Computer Entertainment Technology (2008).

Goldberg, M. E. and Gorn, G. J. "Happy and Sad TV Programs: How They Affect Reactions to Commercials", in Journal of Consumer Research vol. 14, no. 3 (1987), pp. 387-403.

Griskevicius, V., Goldstein, N. J., Mortensen, C. R., Sundie, J. M., Cialdini, R. B. and Kenrick, D. T. "Fear and loving in Las Vegas: Evolution, emotion, and persuasion", in Journal of Marketing Research vol. 46, no. 3 (2009), pp. 384-395.

Grigorovici, D. M. and Constantin, C. D. "Experiencing Interactive Advertising beyond Rich Media: Impacts of Ad Type and Presence on Brand Effectiveness in 3D Gaming Immersive Virtual Environments", in Journal of Interactive Advertising vol. 5, no. 1 (2004). Available at http://jiad.org/article53 (accessed November, 2009)

Herrewijn, L. and Ratarf Games (2010) Flight of the Strihuhn [PC Computer, Online Game].

IJsselsteijn, W.A., de Kort, Y.A.W. and Poels, K. "The Game Experience Questionnaire: development of a self-report measure to assess player experiences of digital games", FUGA Deliverable D3.3. Eindhoven University of Technology, 2008.

Klimmt, C., Hartmann, T. and Frey, A. "Effectance and control as determinants of video game enjoyment", in Cyberpsychology & Behavior vol. 10, no. 6 (2007), pp. 845-874.

Klimmt, C. and Vorderer, P. "Media Psychology is not yet there: Introducing Theories on Media Entertainment to the Presence Debate", in *Presence: Teleoperators and Virtual Environments* vol. 12, no.4 (2003), pp. 346-359.

Lang, P. J. "Behavioral Treatment and Bio-Behavioral Assessment: Computer Applications", in Sidowski, J. B., Johnson, J. H. and Williams, T. A. (Eds.) "Technology in mental health care delivery systems" (1980), pp. 119-137. New Jersey: Ablex Publishing.

Lang, A. "The limited capacity model of mediated message processing", in Journal of Communication vol. 50, no. 1 (2000), pp. 46-70.

Lee, A. Y. and Sternthal, B. "The Effects of Positive Mood on Memory", in Journal of Consumer Research vol. 26, no. 2 (1999), pp. 115-127.

Lemon, M. "Grinding the Axe Body Spray: Linking Gamer Experience and Brand Recall in Guitar Hero III", thesis submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College, 2006.

Mehrabian, A. and Russell, J. A. "An approach lo environmental psychology", Cambridge, Massachusetts: The MIT Press, 1974.

Moorman, M. "Context considered. The relationship between media environments and advertising effects", unpublished doctoral dissertation, Amsterdam: University of Amsterdam, 2003.

Moorman, M., Neijens, P. C. and Smit, E. G. "The effect of program responses on the processing of commercials placed at various positions in the program and the block", in Journal of Advertising Research vol. 48, no. 1 (2006), pp. 49-59.

Morris, J. D. "Observations: SAM: the Self-Assessment Manikin", in Journal of Advertising Research vol. 35, no. 6 (1995), pp. 63-69.

Morris, J. D., Woo, C. M., Geason, J. and Kim, J. "Predicting Intentions: The Power of Affect", in Journal of Advertising Research vol. 42, no. 2 (2002), pp. 7-17.

Murry, J. P., Lastovicka, J. L. and Singh, S. N. "Feelings and liking responses to television programs: an examination of two explanations of media-context effects", in Journal of Consumer Research vol. 18, no. 3 (1992), pp. 441-451.

Nacke, L. E., Grimshaw, M. N. and Lindley, C. A. "More than a feeling: Measurement of sonic user experience and psychophysiology in a first-person shooter game", in Interact. Comput. vol. 22, no. 5 (2010), pp. 336-343.

Newell, S. J., Henderson, K. V. and Wu, B. T. "The effects of pleasure and arousal on recall of advertisements during the Super Bowl", in Psychology and Marketing vol. 18 (2001), pp. 1135–1153.

Norris, C. E. and Colman, A. M. "Context Effects on Recall and Recognition of Magazine Advertisements", in Journal of Advertising vol. 21, no. 3 (1992), pp. 37-46.

Owolabi, A. B. "Effect of Consumers Mood on Advertising Effectiveness", in Europe's Journal of Psychology vol. 2009, no. 4 (2009), pp. 118-127.

Pavelchak, M. A., Antil, J. H. and Munch, J. M. "The Super Bowl: an investigation into the relationship among program context, emotional experience, and ad recall", in Journal of Consumer Research vol. 15, no. 3 (1988), pp. 360-367.

Poels, K., de Kort, Y. A. W. and IJsselsteijn, W. A. "Identification and Categorization of Digital Game Experiences. A Qualitative Study integrating Theoretical Insights and Player Perspectives", working paper, Eindhoven University of Technology, 2009.

Poels, K. and Dewitte, S. "How to capture the heart? Reviewing 20 years of emotion measurement in advertising", in Journal of Advertising Research vol. 46, no. 1 (2006), pp. 18-37.

Poels, K. and Dewitte, S. "Getting a line on print ads. Pleasure and arousal reactions reveal an implicit advertising mechanism", in Journal of Advertising vol. 37, no. 4 (2008), pp. 63-74.

Preacher, K. J. and Hayes, A. F. "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models", in Behav Res Methods vol. 40 (2008), pp. 879-891.

Puccineli, N. M "The impact of customer mood on salesperson evaluation", in Journal of Consumer Research vol. 48, no. 2 (2006), pp. 39-54.

Ravaja, N., Saari, T., Laarni, J., Kallinen, K. and Salminen, M. (2005) "The Psychophysiology of Video Gaming: Phasic Emotional Responses to Game Events". Available at http://www.digra.org/dl/db/06278.36196.pdf (accessed May, 2010)

Sherry, J. L. "Flow and media enjoyment", in Communication Theory vol. 14, no. 4 (2004), pp. 328-347.

van den Hoogen, W. M., IJsselsteijn, W. A. and de Kort, Y. A. W. "Exploring behavioral expressions of player experience in digital games", in Nijholt, A. and Poppe, R. (Eds.) "Proceedings of the workshop for facial and bodily expressions for control and adaptation of games" (2008), pp. 11-19. Amsterdam: ECAG 2008.

van den Hoogen, W. M., IJsselsteijn, W. A. and de Kort, Y. A. "Effects of sensory immersion on behavioural indicators of player experience: Movement synchrony and controller pressure", in Atkins, B., Kennedy, H. and Krzywinska, T. (Eds.) "Breaking New Ground: Innovation in Games, Play, Practice and Theory: Proceedings of the 2009 Digital Games Research Association Conference" (2009), London: Brunel University.

van Reekum, C. M., Johnstone T., Banse R., Etter, A., Wehrle, T. and Scherer, K. R. "Physiological responses to appraisal dimensions in a computer game", in Cognition and Emotion vol. 18, no. 5 (2004), pp. 663-88.

Van Reijmersdal, E., Smit, E. and Neijens, P. "How media factors affect audience responses to brand placement", in International Journal of Advertising vol. 29, no. 2 (2010), pp. 279-302.

Wegener, D. T., Petty, R. E. and Smith, S. M. "Positive mood can increase or decrease message scrutiny: The hedonic contingency view of mood and message processing", in Journal of Personality and Social Psychology vol. 69 (1995), pp. 5-15.

Yankee Group. "Advertising and Games: 2007 In-Game Advertising Forecast", (July 2006). Available at http://www.yankeegroup.com/ResearchDocument.do?id=16395 (accessed November, 2009).