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Contextual advertising in games: Impacts of game context on a player's memory and evaluation of brands in video games

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ABSTRACT

Contextual advertising is growing in digital marketing communication. Previous research on traditional media has shown that the surrounding context affects advertising effectiveness. Similarly, the context in a game may influence a player's processing of brands advertised in that game. To examine the effects of contextual advertising in games, the present article affords two independent experiments investigating how positive and negative game contexts influence players' memories and attitudes with respect to brands advertised via billboards in games. Drawing from literature on the limited capacity model, the authors demonstrate that positive and negative game contexts decrease brand memory since they require a high level of cognitive effort. The authors also find that varying a game context influence the perception of brands advertised in the game via the contextual priming mechanism and that positive contexts generate more positive brand attitudes than negative or neutral contexts. The findings have important implications for consumer researchers and marketers, as they indicate how contexts in games can be utilized to establish brand awareness and increase positive brand perceptions in contextual advertising using games.

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Introduction

Context-aware technology is one of the greatest contributions to the world of advertisement, and contextual advertising is a form of digital advertising that involves placing advertisements for display among relevant contents (Davies 2013). Context-aware technology enables targeted advertising in games that takes advantage of atmospheric conditions and specific game contexts (Davies 2013), and it can be used for in-game advertising (Boyd and Lalla 2009). Today's game developers seek ways to incorporate contextual advertising without interrupting players' natural gaming experience. As a recent example, MediaBrix has created an innovative contextual in-game advertising platform that introduces ways to develop the best coherence between game playing and contextual advertisements (Shaul 2013). In particular, MediaBrix's contextual in-game advertising achieves its goal by timely placements of advertisements based on the company's study of the storyboard of a game. This

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contextual approach to advertising increases players' receptiveness to advertising brands, compared to other means (Shaul 2013). With the recent growth of contextual advertising in games, it is critical for game developers as well as advertisers to understand the effects arising from a game's different contexts, because these directly or indirectly affect players' gaming experience and consequently influence advertising effectiveness. Previous studies in marketing have shown that the adjacent media context (e.g. program or editorial context) influences memories of and attitudes toward brands advertised in traditional media (e.g. newspapers, magazines, and television). Recent studies have also investigated the effect of context in digital channels such as online banner advertisements (Chun, Song, Hollenbeck, and Lee 2014; Yoo 2011). However, far less research has focused on the influence of context on advertising in games.

Previous studies investigating advertising in video games have mostly focused on the advertising outcomes attained from completely played games (i.e. games played from beginning to end). These studies have demonstrated overall positive memory and attitude outcomes after playing the game (Cauberghe and De Pelsmacker 2010; Redondo 2012; Waiguny, Nelson, and Terlutter 2012). Also of relevance, Glass (2007) found that players positively associated with brands advertised in a game much more quickly than brands not advertised. However, to date, no research has focused on in-game advertising at the level of specific game contexts. Consumers are seeking hedonic and utilitarian value through gaming, and hedonic motive influences game play more positively than utilitarian one (Davis, Lang, and Gautam 2013). To create entertainment and provide pleasurable experience to game players, every game has moments of joyful events such as clearing a level, getting a bonus, or hitting a target, as well as profoundly irritating ones like losing a chance, missing a target, or becoming stuck. These positive and negative contexts have come to be known as a primary feature of video game narratives (King, Delfabbro, and Griffiths 2010). Importantly, players' information processing with respect to advertisements embedded in games may be different for specific game contexts in their game scenarios.

To date, little academic research has empirically investigating the relationship between game contexts and advertising effectiveness. For this reason, the current research extends by examining how game context influences how a player processes advertising messages embedded in a game. Specifically, this research experimentally tests the effects of positive, negative, and neutral game context on ad recall, recognition, and attitude. This research will allow advertisers and game developers to better understand how to more effectively leverage games for advertising purposes.

Literature review

The influence of game context on brand memory – the limited capacity model

Gaming researchers have employed the limited capacity model (LCM) to understand how consumers (or players) handle the demanding information processing that game playing requires (Dardis, Schmierbach, and Limperos 2012; Gross 2010; Peters and Leshner 2013). According to Lang (2000, 2006), messages are processed when sufficient mental resources are available. Individuals have limited mental resources, and an individual's mental capacity is often not great enough to process all available information. Messages mediated through games require active behavioral responses (e.g. handling a joystick or clicking mouse buttons)

and high cognitive engagement (e.g. deciding which direction to move or predicting an opponent's reaction), and consequently they are believed to engage a large amount of cognitive resources. During game playing, a person's primary focus is on the game itself, and therefore processing advertised messages within the game is a secondary task (Lee and Faber 2007). Since people prioritize their information processing while playing games, advertisements are processed with cognitive resources that are not being used for the primary task. For this reason, memory traces for the secondary information (the advertisements) might not be strong enough for retrieval during a memory search (Lang and Basil 1998; Shapiro 1999).

Gaming involves both automatic and controlled allocation of cognitive resources (Lee and Faber 2007). The amount of resources a player can devote to an in-game stimulus might vary depending on the level of interactivity of the given task (e.g. driving a car and shooting an enemy), characteristics of the player (e.g. previous gaming experience and gaming skills), and the characteristics of the stimulus (e.g. size, color, sound and in-game events). In particular, different games require different amounts of mental resources, and most games involve highly stimulating audiovisual sensory information (e.g. alarm sounds, bonus points, aggressive enemy avatars and powerful weapons) and more engaging in-game tasks (e.g. participating in combat, winning a reward, being killed by an enemy).

Video games are usually negatively or positively valenced, and this content is dynamically manipulated to afford more entertainment and enjoyment to players by providing fun, excitement, suspense, arousal, or relief (Bryant and Vorderer 2013). According to some psychological research, highly emotional events are more likely than mundane events to be stored in memory (LaBar and Cabeza 2006). However, another school of thought holds an opposing point of view and assumes that emotional reactions often lead to memory trade-offs, enhancing memory for select features of an event while impairing memory for other aspects. For example, memories of emotional events are oblivious to details of certain parts of the events and are more likely to focus on minor aspects of those events, missing the important ones (Brown and Kulik 1977). More recent studies also support the idea that memory can be partially focused on an emotion-provoking event (Holland and Kensinger 2013; Levine and Edelstein 2009; Mather and Sutherland 2011).

Along the same line, Lang, Newhagen, and Reeves (1996) suggested that emotional program contexts (i.e. positive or negative emotion-inducing programs) influence the mental resources required to process embedded information. Due to the emotionally engaging nature of game playing, it is likely that large amounts of cognitive resources are needed to process advertisements within emotional contexts. The present study assumes that emotion-provoking contexts will cause cognitive overload and thus have a negative impact on advertisement processing. Thus, we hypothesize that brand memory will be lower for a brand presented within a positive game context than for a brand presented within a neutral game context, and that brand memory will be impaired when a brand is presented within a negative game context compared to presentation in a neutral game context:

H1a: A billboard presented in a positive game context will show lower brand recall and recognition scores than a brand presented in a neutral game context.

H1b: A billboard presented in a negative game context will show lower brand recall and recognition scores than a brand presented in a neutral game context.

Furthermore, advertising memory might be lower for a negative game context than for a positive game context. This reduction in memory with respect to negative game contexts

can be explained in terms of the excessive cognitive resources required as a survival function for processing frightening scenarios (Lang, Newhagen, and Reeves 1996). Negative events of high significance are more likely to narrow our memory to focus on the most important features of the event rather than details of minor importance (Beck and Clark 1997). For instance, in a 'weapon-focused' event, witnesses are likely to forget all details other than the weapon (Kensinger, Garoff-Eaton, and Schacte 2007). This phenomenon supports the notion that our memories of highly significant negative events usually focus on their main features, with all else eventually slipping out of these memories (Beck and Clark 1997). For example, in fight games where we are supposed to knock down our rivals, our efforts to protect ourselves make us completely oblivious to anything else around us.

In addition, negative game contexts may require players to construct new strategies to attain a game goal (e.g. obtaining points and reaching an endpoint) when the goal is blocked. For example, soon after a negative occurrence, a player will become busy trying to find new ways to get out of the harmful situation and will thus be mentally engaged in the game to such an extent that everything else is forgotten. In contrast, positive events will ensure tranquility for a player's nerves, allowing the player to relax and pay heed to other simultaneous happenings (if any), by lessening the cognitive effort required on the player's part. Thus, we hypothesize that brand memory will be lower when a brand is presented within a negative game context than when a brand is presented within a positive game context:

H1c: A billboard presented in a negative game context will produce lower brand recall and recognition scores than a billboard presented in a positive game context.

The influence of game context on brand attitudes – contextual priming

Advertisers try to create positive associations with brands, and previous research has focused on positive brand attitude formation through gaming (Acar 2007; Glass 2007; Mallinckrodt and Mizerski 2007; Tina and Buckner 2006). The interactive nature of video games increases participant involvement with brands advertised in games through the mental stimulation of following the games' narratives (Escalas 2004), and the positive affect induced by positive gaming experiences (e.g. beating an enemy and mastering a level) transfers to the featured brand (Homer 2006).

One of the most important challenges for advertisers is that the processing of advertising messages does not occur in a vacuum (Bradley 2007), but rather within complicated surroundings such as adjacent programs. Thus, it is most effective to optimize advertisements within the context of a program (Bradley 2007; Schank 1999). Different critical contextual moments in games elicit responses from their players that subsequently influence the processing of advertisements placed in relation to those critical game contexts (Jeong, Bohil, and Biocca 2011; Melzer, Bushman, and Hofmann 2008; Waiguny, Nelson, and Marko 2013; Yoo and Peña 2011). If a player can form a positive attitude toward embedded brands through experiencing a positive gaming moment, then it is also possible for a player to have negative feelings when experiencing a negative situation (Berkowitz 1986). Thus, advertisers can be more successful in eliciting positive responses to their advertisements if they better comprehend the nature of different game contexts.

Research has demonstrated that contextual advertisement is capable of making changes to people's preset beliefs regarding specific brands by activating certain audience attributes. The resulting change in consumers' attitudes is known as the contextual priming effect

(Yi 1990, 1993). In the contextual priming process, easily accessible attributes of information grab more of a person's attention, and the person will then unwittingly begin to show an interest in those attributes (Higgins, Bargh, and Lombardi 1985; Yi 1990). Because people interpret advertisements depending on currently activated concepts, immediately accessible contexts are more influential when interpreting adjacent messages such as advertisements (Erdley and D'Agostino 1988; Higgins, Bargh, and Lombardi 1985).

Game stories with positive and negative contexts may automatically trigger a series of cognitive and emotional reactions, and these automatic processes influence the player's advertising processing (Grodal 2000). Every negative or positive context will associate the relevant response with the advertised brand. Therefore, the perception of a brand advertised during a game depends upon in-game events occurring when the advertisement appears (Berkowitz 1984; Coulter 1998; Yi 1990), and the evaluation of an advertised brand via in-game advertisements depends on which semantically related attribute is automatically facilitated by the game context (Berkowitz 1984; Coulter 1998; Yi 1990). As a recent example, Steffen, Mau, and Schramm-Klein (2013) found that a player's winning context in gaming positively affects advertising evaluation. We hypothesize that when the game context primes an attribute that has positive implications for the evaluation of the brand, the overall brand evaluation will be more positive, but when the context primes an attribute with negative implications, the overall brand evaluation will be impaired:

H2a: A billboard presented in a positive game context will produce a more positive brand attitude than a billboard presented in a negative game context or in a neutral game context.

H2b: A billboard presented in a negative game context will produce a more negative brand attitude than a billboard presented in a neutral game context.

Study 1

Method

Participants

Participants were from a large research university. College students were deemed an appropriate sample given that their age group make up a significant proportion of the video game player population. In particular, ages 18–35 are the largest group (i.e. 30%) among game player demographics in the USA (ESA 2014a). Gaming is important components of young adults' lives, and attracting the age group is essential to marketers. Thus, advertising through games can bring advertisers' brands to the hard to reach young demographic. This study consisted of 60 participants. Among the participants, 52% were female. All respondents were between the ages of 18 and 25 (M = 20.00, SD = 1.32). Fifty-two percent were Caucasian, 23% were Asian, 18% were Latino, 5.0% were African-American, and the remaining 2% were other. Twenty-seven percent were seniors, 28% were juniors, 32% were sophomores, and the remaining 13% were freshmen. Participants' video game experience varied from 0 to 15 years (M = 6.13, SD = 5.84).

Experimental design and stimuli development

Three game context conditions (positive, negative, and neutral context condition) were created to test context effect in in-game advertising. All participants played an advertisement embedded video game, and the given time for game play was a maximum of seven

minutes. This playtime was carefully determined to give players ample time for complete playing after running a series of pre-tests in the stimuli development stage. A first person shooter (FPS) video game was chosen for the stimuli. The use of an FPS game contributes to an under-researched genre within the in-game advertising literature (Mau, Silberer, and Constien 2008). Further, the ecological validity is greater given that many free online FPS games are funded through in-game advertising (e.g. Quake Live, Battlefield: Play4Free, Alien Arena) and commercial FPS games with in-game advertisements are continuously increasing (e.g. Mercenaries 2, Def Jam, Splinter Cell). In addition, leading game developers such as Sony's PlayStation Network are trying to launch Freemium games (i.e. free version online games) supported by in-game ads (Agnello 2012).

To avoid a potential confound effect from previous exposures, a new game was custom developed with the DirectX 10 graphic engine to meet the requirements of this study (see Figure 1). This video game was similar to commercial FPS games with realistic 3D graphics and stereo sound effect. The game player's avatar was given 'god mode' (i.e. invincibility). This manipulation allowed a player to engage in continuous play without being killed by enemy avatars and reduce the effect from a participant's game skill difference coming from varied gaming experience (Eastin 2006).

Research in video games has demonstrated that product placement can affect brand memory and attitudes in terms of how the ad 'fits' within the content of the message (Gross 2010; Hernandez et al. 2004). For example, an in-game billboard for a women's clothing placed in FPS might trigger visual attention, but the incongruency could cause negative affect toward the game as well as the embedded brand (Lee and Faber 2007; Russell 2002). Therefore, through a series of pre-tests, highly relevant advertisements were chosen. In each game condition, four large billboards were posted (see Figure 2).

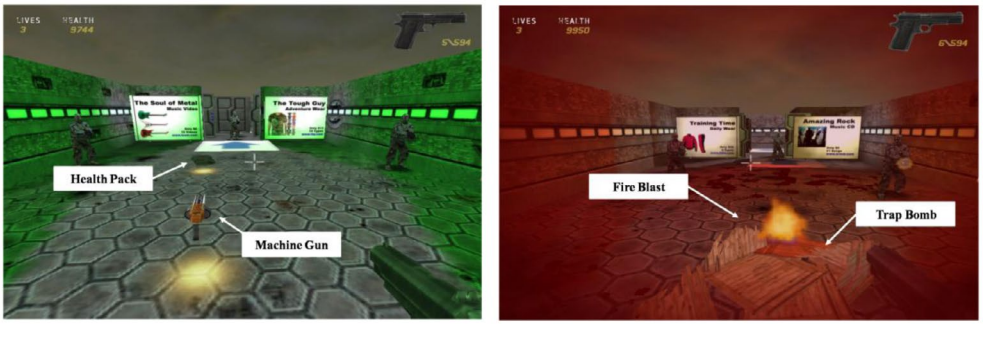

Figure 1. Game context manipulations.

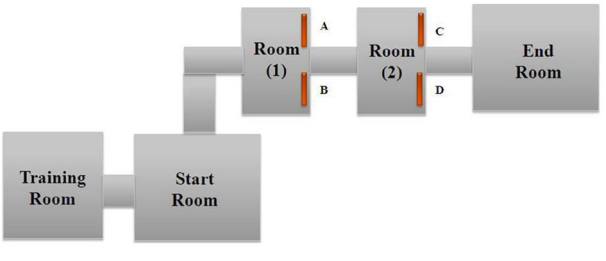

Figure 2. Game environment layout.

As to the products advertised in the video game, the products needed to be (1) relevant to the participants, and (2) important to the participants. Here, relevant and important advertisements should encourage participants to elaborate information processing. To select the adequate product categories, a pretest was conducted ($N = 145$). Participants ranked their top-four most important product categories among the 15 product categories. From the categories, the top four categories (electronics and computers, apparel, shoes and jewelry, and music) were further tested on congruency with shooting games. Within the top four categories, 18 fictitious brands were developed from similar product advertising.

To select the brands that best represent high congruency with a FPS game, 25 undergraduate students participated in another pre-test. These participants rated the perceived congruency of each of the 18 fictitious brands on four different aspects of congruency. Adapted from Lee and Faber (2007), the congruency measures consisted of: (1) it is likely that a product would be seen in FPS games, (2) the images I associate with a product are related to the images I associated with FPS games, (3) a product represents a lifestyle associated with those who like to play FPS games, (4) an advertisement for a product is a good fit for FPS games. All measures were assessed along seven point (1 = strongly disagree, 7 = strongly agree) scales. Items were collapsed to create an overall congruency index. Cronbach's alpha for each game–product congruency index ranged from 0.81 to 0.97. Based on this pretest, the four most congruent brands were chosen for the manipulation. The congruent brands were Amazing Rock ($M = 5.76$, SD = 0.83), Tough Guy Wear ($M = 5.59$, SD = 1.13), The Soul of Metal ($M = 5.48$, SD = 1.40), and Training Time ($M = 4.82$, SD = 1.36). Each brand was advertised in a single in-game poster with its brand name, product category information, a simple product visual, a brand website URL, and other product related messages (see Figure 1).

The stimuli consisted of a virtual space containing five separate rooms with hallways connecting each room. Every embedded advertisement was highly noticeable with no visually blocking obstacles. Among the four advertisements, two were located in Room 1, and the other two were located in Room 2. The participants played the same game three times, after that, the program stopped the game automatically. When each time a gamer plays the game, the order of advertisements was randomized by the algorithm to eliminate potential order effects. Thus, exposure to the advertisements was held consistent (see Figure 2).

To test the hypotheses, three types of game environments were programmed: the positive, negative, and neutral context condition. The positive game context was defined as an in-game situation with an overt depiction of credible rewards (e.g. obtaining points or energy). In contrast, the negative context was defined as an in-game situation with the overt depiction of a credible punishment (e.g. losing points or energy) to a player. In particular, the context manipulation was held in terms of the three aspects of video game contents: (1) enemy avatars, (2) in-game objects, and (3) auditory stimulus. Regarding the enemy avatars, more aggressive and harder to kill avatars were assigned to the negative context. In contrast, less aggressive and easy to kill avatars were included in the positive context. In addition, to manipulate the game environment in terms of a game object, a machine gun and a health pack were provided to the participants in the positive context. In the negative context, participants had to pass a trap bomb and a fire blast. Lastly, in each condition, a positive or negative auditory message was clearly announced (i.e. positive: 'You got a health pack and machine gun!' and negative: 'You are in the dead zone. Get out of here right now!').

Procedures

Participants were tested in a lab setting. The computer program randomly assigned participants to the each experimental condition ($N = 20$ per each condition). Similar to Eastin and Griffiths (2006), before participants were exposed to the stimuli, they were thoroughly trained on how to play the game. This has been done to minimize the effects from each player's different level of self-efficacy related to the FPS video game (Davis and Lang 2012). In addition, participants were instructed to wear headphones during gaming and all games were played on a personal computer equipped with a 3D graphic accelerator card and connected to a 19-inch high-definition (HD) liquid crystal display screen. To prevent possible gender effect, the voice of in-game announcements was randomized in terms of the gender of the announcer. The maximum length of time given for game play was seven minutes, and all participants finished within the given time ($M = 6.21$, SD = 0.68). After finishing the game, participants were guided to a different PC preloaded with a series of questions asking (1) brand recall, (2) brand recognition, and (3) brand attitude using an on-line questionnaire. Once the survey was completed, participants explained their assumptions about the purpose of the study. None of the participants indicated any awareness of the specific hypotheses tested ($N = 0$). After filling out the questionnaire, participants were fully debriefed.

Dependent measures

Brand memory

To gage the memory for the brands embedded in the game, this study applied unaided recall and recognition measurements (Nelson 2002; Russell 2002). For unaided recall, the participants were asked to recall the advertised brand names without being cued ($M = 0.26$, SD = 0.54). As a follow up question, recognition was assessed by asking respondents to select the names of the advertised brands among eight brands. In the examples, the other four fictitious brands did not appear in the game ($M = 1.48$, SD = 1.46).

Brand attitude

As a second measure of effectiveness, an attitude toward the brand scale (MacKenzie and Lutz 1989) was included for each of the four brands. Participants were asked to indicate their attitude toward the brands featured in the game on a three-item, seven-point, semantic differential scale: good/bad; pleasant/unpleasant; and favorable/unfavorable ($M = 3.99$, SD = 1.14). The attitude scale proved reliable in each brand: Amazing Rock ($\alpha = 0.79$), Tough Guy Wear ($\alpha = 0.90$), The Soul of Metal ($\alpha = 0.87$), and Training Time ($\alpha = 0.86$).

Covariates

Game experience and game-play frequency were included as covariates. Both game experience and game-play frequency influence how individuals memorize advertisement messages and evaluate brands because previously structured schema for gaming and game-play skills influence the amount of cognitive resources devoted to processing Lee and Faber 2007). Game experience was assessed by asking participants their years of game-play experience (e.g. How many years have you been playing video games?) ($M = 6.13$, SD = 5.84). Game frequency was measured by asking participants to indicate their frequency of game play in recent months (score = 1 for 'rarely' and score = 7 for 'often') ($M = 3.25$, SD = 2.18). Gender was also treated as a covariate since young males prefer and spend more time playing shooting

games (ESA 2014). This exposure difference could influence information processing during game play (Eastin 2006).

Results

Manipulation checks

Game context and perception

To examine participants' overall perceptions toward the context, a manipulation check was conducted. Here, a perceived positiveness measure consisting of four items (negative/positive, beneficial/harmful, unpleasant/pleasant, and good/bad) was assessed using a seven point (1 = strongly disagree, 7 = strongly agree) scale. An index was produced by averaging the responses to the items ($\alpha = 0.85$). An analysis of variance (ANOVA) found a significant result for context perception, $F(2, 57) = 23.85$, $p < 0.01$, $\eta_p^2 = 0.45$. Tukey *post hoc* tests (Tukey's HSD) demonstrated that participants in the positive context condition reported significantly higher perceived positiveness ($M = 4.90$, SD = 1.19) in comparison to the participants in the negative context condition ($M = 2.60$, SD = 1.18) ($p < 0.01$) and the neutral context condition ($M = 4.11$, SD = 0.77) ($p < 0.05$). Further, the neutral context ($M = 4.11$, SD = 0.77) was perceived more positively than the negative context ($M = 2.60$, SD = 1.18) ($p < 0.01$). In sum, the experimental conditions were perceived differently from each other. Therefore, game context manipulation proved to be successful in terms of a player's context perception.

Game context and attention amount

A four-item, Likert-type scale (1 = strongly disagree, 7 = strongly agree) attention to media scale was adopted from the MEC Spatial Presence Questionnaire (Vorderer et al. 2004). Example items include 'I devoted my whole attention to the game' and 'The game captured my senses'. An ANOVA indicated the attention investment to game play was significantly different by the game conditions, $F(2, 57) = 8.12$, $p < 0.01$, $\eta_p^2 = 0.37$. Tukey's HSD demonstrated that participants in the positive context reported significantly higher attention to game play ($M = 5.63$, SD = 0.74) in comparison to the participants in the neutral context ($M = 4.25$, SD = 1.30). Further, the negative context was required more attentional resources ($M = 6.33$, SD = 0.84) than the neutral context. There was no significant attention difference between the positive context condition and the negative context condition. However, the negative context condition ($M = 6.33$, SD = 0.84) required marginally higher attention resource allocation than the positive context condition ($M = 5.63$, SD = 0.74). Overall, the experimental conditions were different from each other in the expected direction.

The influence of game context on brand memory

For H1, after controlling for game-play experience, $F(1, 54) = 5.39$, $p < 0.05$, game-play frequency, $F(1, 54) = 0.61$, $p > 0.05$, and gender, $F(1, 54) = 0.98$, $p > 0.05$, ANCOVA revealed that the game context influenced the recall of the embedded in-game brand names, $F(2, 54) = 4.97$, $p = 0.01$, $\eta_p^2 = 0.15$. In addition, *post hoc* tests using the Tukey HSD test indicated that participants in the neutral context condition showed significantly higher recall ($M = 0.55$, SD = 0.75) in comparison to the positive context condition ($M = 0.15$, SD = 0.36) as well as the negative context condition ($M = 0.10$, SD = 0.30). Further, the recall rate for the positive context condition ($M = 0.15$, SD = 0.36) was significantly higher than the negative context condition ($M = 0.10$, SD = 0.30).

Game context also influenced brand recognition, $F(2, 54) = 4.99$, $p = 0.01$, $\eta_p^2 = 0.15$, while controlling for game-play experience, $F(1, 54) = 0.42$, $p > 0.05$, game-play frequency, $F(1, 54) = 4.72$, $p < 0.05$, and gender, $F(1, 54) = 0.50$, $p > 0.05$. Post hoc tests further revealed that participants in the neutral context condition showed significantly higher recognition ($M = 2.25$, SD = 1.55) in comparison to participants assigned to the negative context condition ($M = 0.75$, SD = 1.06). However, there was no recognition difference between the neutral context condition ($M = 2.25$, SD = 1.55) and the positive context condition ($M = 1.45$, SD = 1.39). Thus, data partially supported H1a and H1b. Finally, the recognition rate for the positive context condition ($M = 1.45$, SD = 1.39) was significantly higher than the negative context condition ($M = 0.75$, SD = 1.06). Thus, data confirmed H1c (see Figure 3).

The influence of game context on brand attitude

After controlling for game-play experience, $F(1, 54) = 1.75$, $p > 0.05$, game-play frequency, $F(1, 54) = 0.041$, $p > 0.05$, and gender, $F(1, 54) = 1.53$, $p > 0.05$, a significant main effect for attitude toward the embedded brands was detected, $F(2, 54) = 4.25$, $p < 0.05$, $\eta_p^2 = 0.10$. Tukey's HSD showed significant main effects in the predicted directions. Participants in the positive context condition ($M = 5.32$, SD = 1.26) reported more positive evaluations of the advertised brands in the game than participants in the neutral context condition ($M = 4.14$, SD = 1.08). Furthermore, as expected, the results showed the participants assigned to the positive context rated the embedded brands more positively ($M = 5.32$, SD = 1.26) in comparison to the negative context ($M = 4.00$, SD = 1.02). Thus, H2a was supported by the data. However, there was no significant main effect between the negative context condition ($M = 4.00$, SD = 1.02) and the neutral context condition ($M = 4.14$, SD = 1.08). Therefore, the data were unable to support H2b. However, the negative context condition ($M = 4.00$, SD = 1.02) and the neutral context condition ($M = 4.14$, SD = 1.08) were different from each other in the expected direction overall (see Figure 3).

Discussion

Study 1 confirmed the expected effect using a design in which the specific context of the game environment was manipulated as a between-subject factor. The results suggest that a

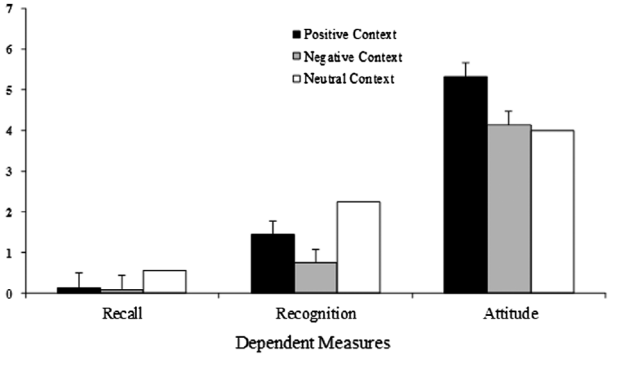

Figure 3. Brand memories and attitudes as affected by the video game context in the between-subject design.

player's memory and attitude are influenced by the contextual factors in games. To accommodate the between-subject design, we created three distinct video games that differed in terms of the game context (i.e. positive, negative, and neutral). The between-subject design was necessary to examine the pure effect coming from a specific game context alone, thus eliminating any potential confounds. Although Study 1 revealed the effect of the game context in the hypothesized direction, exposure to only one of the three contexts (positive, negative, or neutral context) might be an unnatural gaming experience for the participants. This is because most games include various contexts (e.g. achieving points, losing points, and quiet moments) to color a player's gaming experience (King, Delfabbro, and Griffiths 2010). To provide a more conclusive test in a more realistic setting, we designed and conducted a second study to replicate the findings from Study 1 using a within-subject design.

Study 2

In Study 1, we tested and confirmed hypotheses using a between-subject design. This controlled experimental setting can be regarded as a strength of Study 1. However, it also raises questions concerning external validity of the study, since most games have both positive and negative events in their scenarios. To further develop the findings from Study 1, we replicated the study using a naturalistic game narrative that has both positive and negative events as within-subject factors and tested the same hypotheses. In this study, the dependent variables and experimental procedures were the same as those in Study 1, with the only difference between the studies stemming from the experimental design. Thus, in Study 2 we retested the following hypotheses using the same framework presented in Study 1:

H3: In a naturalistic game scenario, a billboard presented in a negative game context will show lower brand recall and recognition scores than a brand presented in a positive game context.

H4: In a naturalistic game scenario, a billboard presented in a positive game context will produce a more positive brand attitude than a billboard presented in a negative game context.

Method

Participants

Participants were from a large university. Sixty students participated and 71% were female. Most respondents (99%) were between the ages of 18 and 25 ($M = 21.00$, SD = 1.22). Fifty-five percent were Caucasian, 23% were Asian, 14% were Latino, 7% were African-American, and the remaining 1% were other. Video game experience ranged between 0 and 20 years ($M = 5.43$, SD = 5.78).

Experimental design and stimuli development

The materials, procedures, and lab settings were consistent with Study 1. For further analysis of effect from a specific context in a game, the data was analyzed by dividing the situations and using each as a within subject factor. That is, the stimulus games were redesigned to have participants experience the both positive and negative contexts in the experiment. In particular, in Study 2, if Room 1 was a positive context, then Room 2 was a negative context, and the order of context manipulation was randomized.

Procedures

Participants played the same stimulus game with the both contexts three times. All participants completed the experiment in approximately 6 min ($M = 6.02$, SD = 0.092). Upon completion of the game, the participants finished an on-line awareness test survey. None of the participants showed any awareness of the hypotheses tested ($N = 0$).

Dependent measures and covariates

Memory measurements were identical to Study 1. Unaided recall ($M = 0.30$, SD = 0.56) and recognition ($M = 1.05$, SD = 1.10) were assessed. In addition, the same attitude measure on a three-item, seven-point scale was used to test participant's evaluation toward the advertised brands ($M = 4.40$, SD = 0.76). The Cronbach alpha scores of attitude measure for each brand were all over 0.80. For the analysis, players' game experience ($M = 6.42$, SD = 6.12), game-play frequency ($M = 3.12$, SD = 2.76), and gender were included as covariates.

Results

The influence of game context on brand memory

Testing H3, a repeated-measures MANCOVA, with game contexts as a within-subject factor, was conducted. After controlling for game-play experience, $F(1, 56) = 2.05$, $p > 0.05$, game-play frequency, $F(1, 56) = 4.04$, $p < 0.05$, and gender, $F(1, 56) = 2.54$, $p > 0.05$, a significant main effect for the influence from the game context on brand recall was detected, $F(1, 56 = 4.05$, $p < 0.05$, $\eta_p^2 = 0.13$. This indicated that the participants in the positive context condition showed significantly higher recall ($M = 0.15$, SD = 1.21) in comparison to the participants assigned to the negative context condition ($M = 0.08$, SD = 0.87). Likewise, brand recognition was higher in the positive context ($M = 1.46$, SD = 1.02) than the negative context ($M = 0.61$, SD = 0.98), $F(1, 56) = 5.46$, $p < 0.05$, $\eta_p^2 = 0.36$, while controlling for game-play experience, $F(1, 56) = 0.44$, $p > 0.05$, game-play frequency, $F(1, 56) = 4.73$, $p < 0.05$, and gender, $F(1, 56) = 0.50$, $p > 0.05$. Thus, the result supported H3 (see Figure 4).

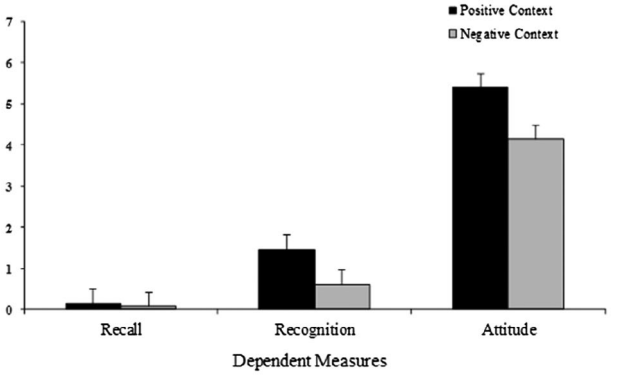

Figure 4. Brand memories and attitudes as affected by the video game context in the within-subject design.

The influence of game context on brand attitude

Again, a repeated-measures MANCOVA tested the influence from the game context on brand attitude. The results showed that participants developed more positive brand attitude within the positive context (M = 5.40, SD = 0.94) compared to the negative context (M = 4.13, SD = 0.92, $F(1, 56) = 4.64$, $p < 0.05$, $\eta_p^2 = 0.27$, while controlling for game-play experience, $F(1, 56) = 0.42$, $p > 0.05$, game-play frequency, $F(1, 56) = 4.73$, $p < 0.05$, and gender, $F(1, 56) = 0.49$, $p > 0.05$. Thus, the result supported H4 (see Figure 4).

General discussion

The present research investigated how game contexts influence players' memories and attitudes with respect to advertised brands in video games. Two studies in combination provide evidence that a player's processing of advertising messages embedded in a game is influenced by the characteristics of the game context. According to the data, players are more likely to remember brands advertised within a neutral game context than within positive or negative game contexts. These results support the LCM and imply that emotional game contexts impair brand memory. This processing overload effect occurs because emotional contexts consume more cognitive resources due to their sensory stimulating and engaging characteristics (Lang 2000; Lang, Newhagen, and Reeves 1996; Shapiro 1999). The memory impairment was stronger in the case of negative contexts.

Information processing of brand placement in entertainment media is unconscious in nature (Russell 1998). This may be especially true in the case of dynamic digital media such as video games. That is, game players may not consciously remember brand names, but they still process the information in the game, including advertisements (Russell 1998). The results of the present research show that the participants developed more positive brand attitudes from a positive context than from a negative context. Thus, contextual priming was successful in changing attitudes toward advertised brands when the game context had affective content. These effects were significant in both Study 1 and Study 2. Overall, as expected, the data support the framework of the LCM and contextual priming mechanisms in video games.

Implications

The present study extends the research stream on advertising effectiveness in video games by investigating the contextual influence of game events on the processing of embedded advertising. As indicated by Study 1, in-game advertisements can create awareness advantages in a neutral context compared to advertisements embedded in positive or negative contexts. It is also evident from both of our studies that positive effects of the game context result in positive brand evaluation. Prior studies investing the effects of contexts in games have investigated how advertising outcomes can depend on a player's experience from playing an entire game. However, the focus of the present study was not on the positive brand evaluations obtained from a complete game, but rather on those obtained from the specific contexts a player experiences during game playing which can be of great academic as well as practical importance for explaining the effects of in-game advertising.

Given our findings that the specific game context influences the effects of advertising, advertisers will understand that advertising outcomes can be context dependent even within a single game. For example, an ad for a newly launching brand should be placed in a relatively neutral game context to help players learn the brand name. In contrast, an ad for an already established brand should be embedded in a positive game story situation that has bonus points, energy packs, or other types of positive feedback, to help players form positive attitudes toward the brand. Given dynamic advertisement presentation capabilities, placing advertisements based on game contexts can lead to more successful brand placement. That is, with the progress of technologies, advertisers will be able to determine the optimal times, locations, and occasions for situating advertising messages based on the player's current situation in the playing.

Following the conventions of traditional advertising media planning, the metrics of in-game advertising effectiveness largely rely on the number of ad impressions and exposures, their frequency, and the cost per 1000 impressions (CPM). Practitioners currently use a tracking system that calculates the time, size, and angle of exposure to in-game ads (Murphy 2008). Further, to improve advertising accountability, advertisers place targeted ads tailored to a user's geographic location and demographic profile (Murphy 2008). However, measurements of in-game advertising based on traditional advertising metrics found in the quantitative aspects of media exposure may be insufficient to determine the effectiveness of advertising in highly sophisticated media such as video games. The measurement of in-game advertising effectiveness should be advanced to include the qualitative aspects of message experiences, such as the contextual influences coming from game stories. It is important for advertisers to find ways to customize and update the in-game advertisements to which a player is exposed based on the context the player is currently experiencing.

Limitations and conclusion

Although the findings of this research offer valuable implications, they should be considered in light of several limitations. First, the use of fictitious brands is a key limitation in the present study. We consider the use of fictitious brands to be necessary to control for varying levels of preexisting associations and brand experiences (Lee and Faber 2007). For this reason, a number of recent studies on games have used fictitious brands in their experimental designs (e.g. Choi, Lee, and Li 2013). However, the advertising outcome might be different if real 'known' brands are used (Nelson, Yaros, and Keum 2006). In particular, advertising memory is more salient for known brands than for unkonwn brands (Mau, Silberer, and Constien 2008), and the present research also showed low memory effect. One recommendation is that future studies should attempt to examine the effect of game contexts using real brands with varying levels of customer loyalty or brand involvement. In addition, the present research only employed the brands that best represent high congruency with a FPS game because our primary research interest is testing the context effect in games. However, interaction between the game context and the brand-game congruity is possible. We believe this is also a good potential research topic for future studies.

Second, it is possible that the brand attitude effect is confounded by high excitation from the gaming. For example, players in the negative context were possibly more excited than those in the neutral context, and such excitation from the emotional events may have inflated evaluation of the brands. The authors believe that three to five minutes of time spent on

behavioral activities (e.g. moving to another online-survey computer station) and cognitive activities (e.g. answering recall and recognition questions) might diminish the excitation from the gaming. However, to prevent possible confounding, future research might also attempt to further control by measuring the same attitudinal outcomes after a delay.

Third, student samples in general suffer from the lack of representativeness of the general population (Calder, Phillips, and Tybout 1981). Even though this concern is not critical in the research related to digital media such as video games. Future research might test the same hypotheses with diverse demographics.

Finally, according to our contextual priming framework, the positive or negative affect tied to the positive or negative context impacts brand evaluation. However, as noted by Petty and Cacioppo (1986), this attitudinal response formed under low-effort peripheral processing is rather immediate rather than long lasting. Because of the transitory nature of the contextual priming, playing a game only once may be not enough to produce long-term effects. Ideally, to test the true effects of in-game advertising, research should be conducted over a longer timeframe with frequent exposures. Additionally, first-person shooter games could be considered negatively contextualized by definition, thus, negatively priming participants prior to any game contextualization. Future research might examine our research questions within a longitudinal design that includes game that are not negatively defined.

In conclusion, the present research investigated the factors underlying the effectiveness of advertisements in relation to a game's context. This research showed how advertisers can strategically use game contexts to meet their advertising goals, and it revealed a number of interesting insights. Our research also provides several important suggestions for further research. Based on our findings, advertisers need to make the best use of video games by strategically locating their advertisements in the contexts that will maximize advertising effectiveness.

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References

Acar, A. 2007. "Testing the Effects of Incidental Advertising Exposure in Online Gaming Environment." *Journal of Interactive Advertising* 8 (1): 45–56. doi:10.1080/15252019.2007.10722136.

Agnello, A. J. 2012. "Sony Patents Method for PlayStation in-Game Advertising that Stops Games to Show You a Commercial." Accessed March 28, 2014. http://www.digitaltrends.com/gaming/sony-patents-method-for-playstation-in-game-advertising-that-stops-games-to-show-you-a-commercial/#!BIbp8

Baker, W. E. 1999. "When Can Affective Conditioning and Mere Exposure Directly Influence Brand Choice?" *Journal of Advertising* 28 (4): 31–46. doi:10.1080/00913367.1999.10673594.

Beck, A. T., and D. A. Clark. 1997. "An Information Processing Model of Anxiety: Automatic and Strategic Processes." *Behaviour Research and Therapy* 35 (1): 49–58. doi:10.1016/S0005-7967(96)00069-1.

Berkowitz, L. 1984. "Some Effects of Thoughts on Anti- and Prosocial Influences of Media Events: A Cognitive-Neoassociation Analysis." *Psychological Bulletin* 95 (3): 410–427. doi: 10.1037/0033-2909.95.3.410.

Berkowitz, L. 1986. "Situational Influences on Reactions to Observed Violence." *Journal of Social Issues* 42 (3): 93–106. doi:10.1111/j.1540-4560.1986.tb00244.x.

Boyd, G., and Lalla, V. 2009. "Emerging Issues in In-Game Advertising." Accessed March 26, 2014. http://www.dglaw.com/images_user/newsalerts/Boyd_Lalla_Emerging%20Issues%20in%20In%20Game%20adv_Feb09.pdf

Bradley, S. D. 2007. "Dynamic, Embodied, Limited-Capacity Attention and Memory: Modeling Cognitive Processing of Mediated Stimuli." *Media Psychology* 9 (1): 211–239. doi: 10.1080/15213260709336810.

Brown, R., and J. Kulik. 1977. "Flashbulb Memories." *Cognition* 5 (1): 73–99. doi:10.1016/0010-0277(77)90018-X.

Bryant, J., and P. Vorderer. 2013. *Psychology of Entertainment*. London: Routledge.

Calder, B. J., L. W. Phillips, and A. M. Tybout. 1981. "Designing Research for Application." *Journal of Consumer Research* 8 (2): 197–207.

Cauberghe, V., and P. De Pelsmacker. 2010. "Advergames." *Journal of Advertising* 39 (1): 5–18. doi: 10.2753/JOA0091-3367390101.

Choi, Y. K., S. M. Lee, and H. Li. 2013. "Audio and Visual Distractions and Implicit Brand Memory: A Study of Video Game Players." *Journal of Advertising* 42 (2–3): 219–227. doi: 10.1080/00913367.2013.775798.

Chun, K. Y., J. H. Song, C. R. Hollenbeck, and J. Lee. 2014. "Are Contextual Advertisements Effective? The Moderating Role of Complexity in Banner Advertising." *International Journal of Advertising* 33 (2): 351–371. doi:10.2501/IJA-33-2-351-371.

Coulter, K. S. 1998. "The Effects of Affective Responses to Media Context on Advertising Evaluations." *Journal of Advertising* 27 (4): 41–51. doi:10.1080/00913367.1998.10673568.

Dardis, F. E., M. Schmierbach, and A. M. Limperos. 2012. "The Impact of Game Customization and Control Mechanisms on Recall of Integral and Peripheral Brand Placements in Videogames." *Journal of Interactive Advertising* 12 (2): 1–12. doi:10.1080/15252019.2012.10722192.

Davies, R. 2013. "Why Brands have to Grasp Context-Aware Advertising through Mobile Phones." Accessed March 20, 2014. http://www.brandrepublic.com/opinion/1214320

Davis, R., and B. Lang. 2012. "Modeling the Effect of Self-Efficacy on Game Usage and Purchase Behavior." *Journal of Retailing and Consumer Services* 19 (1): 67–77. doi: 10.1016/j.jretconser.2011.09.002.

Davis, R., B. Lang, and N. Gautam. 2013. "Modeling Utilitarian-Hedonic Dual Mediation (UHDM) in the Purchase and Use of Games." *Internet Research* 23 (2): 229–256. doi:10.1108/10662241311313330.

Eastin, M. S. 2006. "Video Game Violence and the Female Game Player: Self-and Opponent Gender Effects on Presence and Aggressive Thoughts." *Human Communication Research* 32 (3): 351–372. doi: 10.1111/j.1468-2958.2006.00279.x.

Eastin, M. S., and R. P. Griffiths. 2006. "Beyond the Shooter Game Examining Presence and Hostile Outcomes among Male Game Players." *Communication Research* 33 (6): 448–466. doi: 10.1177/0093650206293249.

ESA (Entertainment Software Association) 2014a. "Essential Facts about the Computer and Video Game Industry 2015." Accessed January 10, 2016. http://www.theesa.com/facts/pdfs/esa_ef_2012.pdf

ESA (Entertainment Software Association) 2014b. "Industry Facts." Accessed January 10, 2016. http://www.theesa.com/facts/index.asp

Erdley, C. A., and P. R. D'Agostino. 1988. "Cognitive and Affective Components of Automatic Priming Effects." *Journal of Personality and Social Psychology* 54 (5): 741–747. doi:10.1037/0022-3514.54.5.741.

Escalas, J. E. 2004. "Imagine Yourself in the Product: Mental Simulation, Narrative Transportation, and Persuasion." *Journal of Advertising* 33 (2): 37–48. doi:10.1080/00913367.2004.10639163.

Glass, Z. 2007. "The Effectiveness of Product Placement in Video Games." *Journal of Interactive Advertising* 8 (1): 23–32. doi:10.1080/15252019.2007.10722134.

Grodal, T. 2000. "Video Games and the Pleasures of Control." In *Media Entertainment: The Psychology of Its Appeal. LEA's Communication Series*, edited by Dolf Zillmann and Peter Vorderer, 197–213. Mahwah, NJ: Lawrence Erlbaum Associates.

Gross, M. L. 2010. "Advergames and the Effects of Game-Product Congruity." *Computers in Human Behavior* 26 (6): 1259–1265. doi:10.1016/j.chb.2010.03.034.

Hernandez, M. D., S. Chapa, M. S. Minor, C. Maldonado, and F. Barranzuela. 2004. "Hispanic Attitudes toward Advergames." *Journal of Interactive Advertising* 5 (1): 74–83. doi:10.1080/15252019.2004.10722095.

Higgins, E. T., J. A. Bargh, and W. J. Lombardi. 1985. "Nature of Priming Effects on Categorization." *Journal of Experimental Psychology: Learning, Memory, and Cognition* 11 (1): 59–69. doi:10.1037/0278-7393.11.1.59.

Holland, A. C., and E. A. Kensinger. 2013. "The Neural Correlates of Cognitive Reappraisal during Emotional Autobiographical Memory Recall." *Journal of Cognitive Neuroscience* 25 (1): 87–108. doi:10.1162/jocn_a_00289.

Homer, P. M. 2006. "Relationships among Ad-Induced Affect, Beliefs, and Attitudes: Another Look." *Journal of Advertising* 35 (1): 35–51. doi:10.2753/JOA0091-3367350103.

Jeong, E. J., C. J. Bohil, and F. A. Biocca. 2011. "Brand Logo Placements in Violent Games." *Journal of Advertising* 40 (3): 59–72. doi:10.2753/JOA0091-3367400305.

Kensinger, E. A., R. J. Garoff-Eaton, and D. L. Schacte. 2007. "Effects of Emotion on Memory Specificity: Memory Trade-Offs Elicited by Negative Visually Arousing Stimuli." *Journal of Memory and Language* 56 (4): 575–591. doi:10.1016/j.jml.2006.05.004.

King, D., P. Delfabbro, and M. Griffiths. 2010. "Video Game Structural Characteristics: A New Psychological Taxonomy." *International Journal of Mental Health and Addiction* 8 (1): 90–106. doi:10.1007/s11469-009-9206-4.

LaBar, K. S., and R. Cabeza. 2006. "Cognitive Neuroscience of Emotional Memory." *Nature Reviews Neuroscience* 7 (1): 54–64. doi:10.1038/nrn1825.

Lang, A. 2000. "The Limited Capacity Model of Mediated Message Processing." *Journal of Communication* 50 (1): 46–70.

Lang, A. 2006. "Using the Limited Capacity Model of Motivated Mediated Message Processing to Design Effective Cancer Communication Messages." *Journal of Communication* 56 (S1): S57–S80. doi:10.1111/j.1460-2466.2006.00283.x.

Lang, A., and M. D. Basil. 1998. "Attention, Resource Allocation, and Communication Research: What Do Secondary Task Reaction Times Measure, Anyway?" *Communication Yearbook* 21: 443–473.

Lang, A., J. Newhagen, and B. Reeves. 1996. "Negative Video as Structure: Emotion, Attention, Capacity, and Memory." *Journal of Broadcasting & Electronic Media* 40 (4): 460–477. doi:10.1080/08838159609364369.

Lee, M., and R. J. Faber. 2007. "Effects of Product Placement in on-Line Games on Brand Memory: A Perspective of the Limited-Capacity Model of Attention." *Journal of Advertising* 36 (4): 75–90. doi:10.2753/JOA0091-3367360406.

Levine, L. J., and R. S. Edelstein. 2009. "Emotion and Memory Narrowing: A Review and Goal-Relevance Approach." *Cognition and Emotion* 23 (5): 833–875. doi:10.1080/02699930902738863.

MacKenzie, S. B., and R. J. Lutz. 1989. "An Empirical Examination of the Structural Antecedents of Attitude toward the Ad in an Advertising Pretesting Context." *Journal of Marketing* 53 (2): 48–65. doi:10.2307/1251413.

Mallinckrodt, V., and D. Mizerski. 2007. "The Effects of Playing an Advergame on Young Children's Perceptions, Preferences, and Requests." *Journal of Advertising* 36 (2): 87–100. doi:10.2753/JOA0091-3367360206.

Mather, M., and M. R. Sutherland. 2011. "Arousal-Biased Competition in Perception and Memory." *Perspectives on Psychological Science* 6 (2): 114–133. doi:10.1177/1745691611400234.

Mau, G., G. Silberer, and C. Constien. 2008. "Communicating Brands Playfully: Effects of in-Game Advertising for Familiar and Unfamiliar Brands." *International Journal of Advertising* 27 (5): 827–851. doi: 10.2501/S0265048708080293.

Melzer, A., B. J. Bushman, and U. G. Hofmann. 2008. "When Items Become Victims: Brand Memory in Violent and Nonviolent Games." In Entertainment Computing-ICEC 2008. . Pittsburgh, PA: Springer, 11–22. doi: 10.1007/978-3-540-89222-9_2.

Murphy, D. 2008. "Marketers Look to Keep Score with In-game Advertising." Accessed April 7, 2013. http://www.marketingmagazine.co.uk/article/789613/marketers-look-keep-score-in-game-advertising

Nelson, M. R. 2002. "Recall of Brand Placements in Computer/Video Games." *Journal of Advertising Research* 42 (2): 80–92.

Nelson, M. R., R. A. Yaros, and H. Keum. 2006. "Examining the Influence of Telepresence on Spectator and Player Processing of Real and Fictitious Brands in a Computer Game." *Journal of Advertising* 35 (4): 87–99. doi: 10.2753/JOA0091-3367350406.

Peters, S., and G. Leshner. 2013. "Get in the Game: The Effects of Game-Product Congruity and Product Placement Proximity on Game Players' Processing of Brands Embedded in Advergames." *Journal of Advertising* 42 (2–3): 113–130. doi:10.1080/00913367.2013.774584.

Petty, R. E., and J. T. Cacioppo. 1986. "The Elaboration Likelihood Model of Persuasion." *Advances in Experimental Social Psychology* 19: 123–205. doi:10.1007/978-1-4612-4964-1_1.

Redondo, I. 2012. "The Effectiveness of Casual Advergames on Adolescents' Brand Attitudes." *European Journal of Marketing* 46 (11/12): 1671–1688. doi:10.1108/03090561211260031.

Russell, C. A. 1998. "Toward a Framework of Product Placement: Theoretical Propositions." *Advances in Consumer Research* 25 (1): 357–362.

Russell, C. A. 2002. "Investigating the Effectiveness of Product Placements in Television Shows: The Role of Modality and Plot Connection Congruence on Brand Memory and Attitude." *Journal of Consumer Research* 29 (3): 306–318. doi:10.1086/344432.

Schank, R. C. 1999. *Dynamic Memory Revisited*. 2nd ed. New York: Cambridge University Press.

Shapiro, S. 1999. "When an Ad's Influence is beyond Our Conscious Control: Perceptual and Conceptual Fluency Effects Caused by Incidental Ad Exposure." *Journal of Consumer Research* 26 (1): 16–36.

Shaul, B. 2013. "MediaBrix Touts Success of Breakthrough Moments in Mobile Games." Accessed February 10, 2015. http://www.adweek.com/socialtimes/mediabrix-touts-success-of-breakthrough-moments-in-mobile-games/545315?red=im

Steffen, C., G. Mau, and H. Schramm-Klein. 2013. "Who is the Loser When I Lose the Game? Does Losing an Advergame have a Negative Impact on the Perception of the Brand?" *Journal of Advertising* 42 (2–3): 183–195. doi:10.1080/00913367.2013.774598.

Tina, W., and K. Buckner. 2006. "Receptiveness of Gamers to Embedded Brand Messages in Advergames." *Journal of Interactive Advertising* 7 (1): 3–32. doi:10.1080/15252019.2006.10722123.

Vorderer, P., Wirth, W., Gouveia, F. R., Biocca, F., Saari, T., Jäncke, L., Böcking, S., Schramm, H., Gysbers, A., and Hartmann, T. 2004. "MEC Spatial Presence Questionnaire". Abgerufen von: http://academic.csuohio. edu/kneuendorf/frames/MECFull. pdf (2004).

Waiguny, M. K., M. R. Nelson, and B. Marko. 2013. "How Advergame Content Influences Explicit and Implicit Brand Attitudes: When Violence Spills over." *Journal of Advertising* 42 (2–3): 155–169. doi: 10.1080/00913367.2013.774590.

Waiguny, M. K., M. R. Nelson, and R. Terlutter. 2012. "Entertainment Matters! The Relationship between Challenge and Persuasiveness of an Advergame for Children." *Journal of Marketing Communications* 18 (1): 69–89. doi:10.1080/13527266.2011.620766.

Yi, Y. 1990. "The Effects of Contextual Priming in Print Advertisements." *Journal of Consumer Research* 17 (2): 215–222.

Yi, Y. 1993. "Contextual Priming Effects in Print Advertisements: The Moderating Role of Prior Knowledge." *Journal of Advertising* 22 (1): 1–10. doi:10.1080/00913367.1993.10673391.

Yoo, C. 2011. "Interplay of Message Framing, Keyword Insertion and Levels of Product Involvement in Click-through of Keyword Search Ads." *International Journal of Advertising* 30 (3): 399–424. doi: 10.2501/IJA-30-3-399-424.

Yoo, S., and J. Peña. 2011. "Do Violent Video Games Impair the Effectiveness of in-Game Advertisements? The Impact of Gaming Environment on Brand Recall, Brand Attitude, and Purchase Intention." *Cyber Psychology, Behavior & Social Networking* 14 (7/8): 439–446. doi: 10.1089/cyber.2010.0031.