The Effects of Interactive Brand Placements in Online Games on Children’s Cognitive, Affective, and Conative Brand Responses

Eva van Reijmersdal*
Jeroen Jansz
Oscar Peters
Guda van Noort

Author Note
Eva A. van Reijmersdal (PhD, University of Amsterdam) is assistant professor at the Amsterdam School of Communications Research ASCoR, University of Amsterdam, The Netherlands; Jeroen Jansz (Ph.D., Leiden University) is special professor at Erasmus University Rotterdam, The Netherlands; Oscar Peters (Ph.D., University of Twente) is managing director of the Institute for Behavioral Research, University of Twente, The Netherlands. Guda van Noort (PhD, VU University Amsterdam) is assistant professor at ASCoR, University of Amsterdam.

The authors thank Neil van der Veer and Sjoerd Buitinga, Newcom Research & Consultancy for the data collection.

Correspondence concerning this article should be addressed to Eva van Reijmersdal, ASCoR, University of Amsterdam, Kloveniersburgwal 48, 1012 CX Amsterdam, The Netherlands, T: +31 (0)20 5253986, F: +31 (0)20 5253681, e.a.vanreijmersdal@uva.nl
Abstract

This study investigated how persuasive messages integrated in an online game affects children’s cognitive, affective, and conative responses to the brand, as well as their attitude toward the game itself. An experiment conducted among 2453 girls between the ages of 11 and 17 demonstrated that confrontation with interactive brand placement in the game resulted in more positive attitudes toward the game, higher top of mind awareness of the brand, more positive brand images, and more favorable behavioral intentions. In addition, consistent with persuasion literature and theories on child development, this study showed that there was a three-way interaction effect between exposure to the brand placement, age, and prior brand use for behavioral intentions. The youngest girls who had no prior experience with the brand were more strongly influenced by the brand placement than the oldest girls who had no prior brand experience.

*Keywords:* Brand placement, in-game advertising, online games, interactivity
The Effects of Interactive Brand Placements in Online Games on Children’s Cognitive, Affective, and Conative Brand Responses

The internet is becoming a larger part of everyday life. A substantial portion of the time spent online is devoted to playing online games (Benjamin, 2010; Jung & Kang, 2010). Therefore, advertisers are increasingly using online games to disseminate their messages and reach an attentive audience (Klein, 2009; Wise, Bolls, Kim, Venkataraman, & Meyer, 2008). For example, McDonald’s offers Sims players the opportunity to franchise a restaurant within the game, and cars such as a Subaru Impreza or a BMW 120d can be used for racing in the game ‘Gran Turismo.’

Persuasive messages in (online) computer and video games, known as in-game advertising or brand placement in games, is the integration of branded products or brand logos into existing online or video games, similar to brand placement in movies (Lee, Choi, Quilliam, & Cole, 2009; Yang, Roskos-Ewoldsen, Dinu, & Arpan, 2006). The scientific research on uses and effects of online games is increasing (e.g., Barlett, Vowels, Shanteau, Crow, & Miller, 2009; Benjamin, 2010; Tobin & Grondin, 2009; Williams, Yee, & Caplan, 2008), however, the effects of persuasive messages integrated into games need more attention. The research has not kept pace with developments in the gaming industry. Although many studies on brand placement in games have been conducted recently, there are at least five lacunae in the literature that are addressed by the present study.

First, brand placements in games are increasingly interactive, for example when gamers can visit a virtual branded shop and buy products or when gamers can drive in a branded car (Lee et al., 2009). However, previous studies on in-game advertising and advergames mainly focused on billboard style ads, which do not allow interaction with the brand (e.g., Mau, Silberer, &
Actual interaction with branded products within an enjoyable game environment is believed to have a stronger impact on gamers’ brand responses (Lee et al., 2009). Therefore, previous findings for static brand placement in games might not hold for interactive brand placement.

Second, the focus on billboard style ads is related to the bias in previous research toward racing, sports, and shooting games, which often include static in-game advertising. In-game advertising in other popular game genres, such as fantasy and role-playing games, has been neglected. Therefore, results from previous studies cannot be generalized to a) interactive brand placement and to b) placement in other game genres.

Third, games increasingly engage children and adolescents with rich and animated interactive brand imagery in a playful environment (Bailey, Wise, & Bolls, 2009; Mallinckrodt & Mizerski, 2007; Nairn & Fine, 2008). However, most studies on the effects of in-game advertising have focused on adults (e.g., Nicovich, 2005; Yang & Wang, 2008; Yang et al., 2006). But, the literature on children and advertising has shown that children and adolescents respond very differently to advertising than adults due to cognitive, emotional, and social differences between adults and children (Livingstone & Helsper, 2006; Valkenburg & Cantor, 2001). Consequently, the effects of in-game advertising on adults cannot be assumed to hold for children as well.

Fourth, there are hardly any empirical tests of the effects of in-game advertising beyond memory among any population (Mallinckrodt & Mizerski, 2007). As stressed by Balasubramanian, Karrh and Patwardhan (2006), it is important to focus on the cognitive, affective, and conative effects of brand placement to really advance our understanding of this
phenomenon. In addition, effects of brand placement on attitudes toward the game itself remain largely unstudied.

Fifth, the few studies on the effects of brand placement in games that have been conducted have generally neglected moderators of these effects. However, Mallinckrodt and Mizerski (2007) showed that game effects are moderated by age, gender, and socioeconomic background.

The present study adds to the literature as it addresses these five lacunae by examining the effects of (1) interactive brand placement in (2) an online role playing game (3) targeted at children on (4) cognitive, affective, and conative responses. In addition, (5) moderator effects of age and brand use are scrutinized.

Theory and Hypotheses

Brand placement in games can affect reactions toward the brand, but also toward the medium vehicle itself, in this case the game. The literature has often focused on the effects of brand placement on the brand itself; however, the effects of brand placement on the appreciation of the game remain largely unstudied. It has been shown that the positive evaluation of a medium vehicle (e.g., television program, magazine) can spill over to the brands that are integrated (Mau et al., 2008; Nelson et al., 2006; Van Reijmersdal, Neijens, & Smit, 2007; Wise et al., 2008), but whether the reverse is true remains unclear.

Some studies found negative effects of brand placement in a game on attitudes toward the game. Mau et al. (2008) showed that billboards in the first person shooter game Counter Strike had a negative effect on attitude toward the game. Additionally, Hernandez et al. (2004) showed that gamers who thought brand placements were intrusive had more negative attitudes toward racing and sports advergames. Reactance theory explains these findings (Brehm & Brehm, 1981;
A brand in a game may be not appreciated because it is perceived as intrusive, commercial, and an attempt to persuade. Players may feel that their autonomy is violated (Friestad & Wright, 1994; Nebenzahl & Jaffe, 1998). As a reaction, people become negative about the agent that is trying to persuade, in this case the game itself (Mau et al., 2008).

However, some studies on brand placement in games have found positive effects on attitudes toward the medium vehicle based on verisimilitude or perceived realism (Gupta, Balasubramanian, & Klassen, 2000; Nelson, 2002; Nelson & Devenathan, 2006). For example, Nelson (2002) showed that gamers thought that branding on billboards along racing tracks in the game ‘Gran Turismo’ added to the game’s realism. Verisimilitude effects especially hold for settings that include advertising in real life, such as billboards around racing tracks or sports arenas. When advertising is not present, the experience of the game does not resemble real life and is perceived as less realistic. Thus the positive effect of brand placement in games on the attitude toward the game seems to depend on whether the placement adds value to the game (Herandez et al., 2004; Mau et al., 2008). However, these studies did not compare games with and without (interactive) brand placements; they only asked gamers and viewers what they thought about the brand placements. Thus, the causal effects of brand placement in games on reactions toward the game itself have not received much attention.

Contrary to the static placements that were studied in previous research, the present study examines an interactive brand placement that adds challenge, information, and rewards to the game. Therefore, the following hypothesis was formulated:

**H1:** Interactive brand placement in an online game has a positive effect on attitudes toward the game.
Besides effects on responses to the game, interactive brand placement might have effects on responses to the placed brand as well. The literature on brand responses has predominantly focused on the effects of static brand placements in games. The effects of billboards, static logos or branded products on cognitive and affective responses to the brand have been studied (e.g., Grigorovici & Constantin, 2004; Lee & Faber, 2007; Mau et al., 2008; Nelson et al., 2006; Schneider & Cornwell, 2005; Wise et al., 2008; Yang et al., 2006). However, the gaming industry has developed, and is increasingly using, interactive brand placements (Lee et al., 2009).

Based on the literature pertaining to interactivity, presence, immersion, and virtual experience, we can expect that the effects of interactive brand placements differ from those of static placements. Interaction with brands in a gaming environment can evoke feelings of being present in the game and feelings of actual product use (Lee, 2004; Lee et al., 2009; Mallinckrodt & Mizerski, 2007; Molesworth, 2006; Sweetser & Wyeth, 2005). This virtual product experience may transfer to real life and influence reactions to the brand and the “real” product. Examples of virtual product experience in games are driving a branded car or opening a virtual bank account and receiving interest on money earned in the game. Research has shown that media that provide experiences that are perceived as real result in stronger attitude formation than those that do not (Coyle & Thorson, 2001; Lombard & Ditton, 1997; Molesworth, 2006). Some studies even showed that, when recalling virtual experiences from memory, distinctions between real and virtual experiences disappeared (Shapiro & Lang, 1991; Shapiro & McDonald, 1992). This explains why virtual interactivity with a brand in a game is considered to be of great influence on gamers (Lee et al., 2009). Especially when interaction with a brand takes place in an enjoyable context, the effects on brand responses may be very strong. In other words, these research
approaches suggest that interaction with brands in a playable context enhance information processing and persuasion (Molesworth, 2006).

So far, only three studies have focused on the effects of interactive brand placements in games. Mackay, Ewing, Newton, and Windisch (2009) showed that interactive brand placement in a racing game increased adults’ brand recall and improved brand attitudes for gamers who had relatively negative preexisting attitudes toward the brand. Yang and Wang’s study (2008) was the only study that focused on the effects of interactive brand placement on all three types of brand responses. They showed that interactive brand placement in shooting and puzzle games affected students’ cognitive, affective, and conative brand responses. Mallinckrodt and Mizerski (2007) showed that interactive brand placements in an advergame affected children’s (5 to 8 year olds) perceptions, preferences, and requests. However, these studies either focused on all three types of responses to the brand, or on children, but none of them focused on the cognitive, affective and conative responses of children to interactive brand placement in a role-playing game. Therefore, this study was designed to examine adolescents’ brand responses to interactive brand placement. The following hypotheses were formulated:

**H2a:** Interactive brand placement in a game has a positive effect on children’s cognitive responses (top of mind awareness of the brand).

**H2b:** Interactive brand placement in a game has a positive effect on children’s affective responses (brand image).

**H2c:** Interactive brand placement in a game has a positive effect on children’s conative responses (behavioral intention toward the brand).

In children and adolescents’ reactions to advertising, age plays an important role. Children of different ages show different reactions to advertising because of differences in
cognitive development, persuasion knowledge, and ability to use techniques to resist persuasion (Friestad & Wright, 1994; John, 1999; Moschis, 1987; Valkenburg, 2004; Valkenburg & Cantor, 2001). As children grow older, they are believed to develop into customers who have the same critical and reflective skills to deal with advertising that adults are supposed to have (John, 1999; Moschis, 1987; Valkenburg & Cantor, 2001).

Although there is a lot of debate about the exact ages at which children become capable of coping with advertising and persuasion attempts, it is assumed that late elementary children (10-12 year olds) still require prompts or cues to activate critical processing of advertising (John, 1999), whereas children aged 13 years and above are assumed to have adult-like cognitive processing capacities. At this age, children become capable of processing advertising at the most elaborate level and of being more critical and skeptical toward the surrounding world, including the commercial environment, due to the development of hypothetical-deductive reasoning skills (John, 1999; Pechmann, Levine, Loughlin, & Leslie, 2005). According to these insights, one could expect that younger children react differently to interactive brand placements in games than older children.

However, studies on brand placement in different media among children did not show age effects. With respect to cognitive responses, Auty and Lewis (2004) showed that children between 6 and 7 years old memorized brands placed in a movie just as well as children between 11 and 12 years old. Similarly, Nelson found no effects of age on children’s (11-15 year olds) attitude toward brand placement in movies (Nelson & McLeod, 2005). In addition, in a study on the effects of advergames on children between 5 and 8 years old, Mallinckrodt and Mizerski (2007) did not find that age moderated affective or conative responses to the brands. However,
they did show that older children showed a better understanding of the persuasive intent and commercial source of the advergame than younger children.

The lack of age effects in case of brand placements in games and movies can be explained by the “hidden nature” of this advertising format. As the brand is completely integrated into the editorial content, in this case a game, the persuasive intent and commercial sender of the message are often unclear (Mallinckrodt & Mizerski, 2007; Nebenzahl & Jaffe, 1998), which might result in less critical attitudes toward the brand placement among people of all ages (Moore & Rideout, 2007; Nairn & Fine, 2008). The skills that older children are supposed to have to process advertising critically might not be sophisticated enough to processes brand placements that are deliberately masked as editorial content (Nairn & Fine, 2008). Even for adults, defenses against persuasion might not become active when confronted with brand placements (Nairn & Fine, 2008), especially when they appear in positive and enjoyable contexts, such as a game. Thus, although the literature on traditional advertising has shown that age moderates its effects, the literature on brand placement seems to show that age does not moderate the effects of these subtle advertising formats. Because of these contradictory findings of age as a moderator of advertising and brand placement effects, the following research question was formulated:

**RQ1**: Does age moderate the effect of interactive brand placement in a game on cognitive (top of mind awareness), affective (brand image), and conative (behavioral intention) responses?

Another possible moderator of brand placement effects is prior brand use or prior experience with the brand. The literature on advertising shows that prior brand use is of great importance to advertising effects (Castleberry & Ehrenberg, 1990). People’s individual
experiences with a brand have such powerful meanings for customers that advertising is unlikely to be able to change their brand perceptions (Castleberry & Ehrenberg, 1990; Romaniuk, 2001).

Nevertheless, none of the studies on brand placement in games focused on the possible moderator effects of prior brand use; they only focused on effects of unknown or fictitious versus known or real brands in games (Mau et al., 2008; Nelson et al., 2006). These studies showed that familiar or real brands had stronger effects on brand memory and brand attitude than unfamiliar or fictitious brands (Mau et al., 2008; Nelson et al., 2006). To predict the effects of prior brand use, the literature on brand placement in other media can be useful. For example, Barthel Sheehan and Guo (2005) showed that prior brand use was an important moderator of the effects of brand placement in a reality program on brand familiarity (cognitive response) and on attitudes and beliefs about the brand (affective responses). Viewers who had previous experience with the airline were not influenced by the television program, whereas viewers who had no experience with the brand showed more positive beliefs about the brand after watching the show. Thus, after exposure to the program, the beliefs of non-users were more similar to those of users. However, they did not find a difference between users and non-users with respect to the overall attitude toward the brand. Barthel Sheehan and Guo (2005) hypothesized that viewing a program that featured an extended portrayal of different aspects of the brand gave non-users an opportunity to experience the brand in a way that was similar to real-world experience. Non-users lack actual experience to use in developing attitudes and beliefs, but this experience may be imitated by merely watching the brand in the program.

If we translate these results to interactive brand placements in games, it can be expected that an interactive experience with a brand in a virtual environment has a powerful effect on the players, and especially on those who have no prior experience with the brand. The interaction
with the brand might be so rich in imagery that the experience in a virtual environment has the same effect as real product experience (Molesworth, 2006). This would mean that interactive brand placements have a strong effect on all players, but an even stronger effect on non-users of the brand. Because this assumption has never been tested for interactive brand placements in games, we formulated the following research question for effects on cognitive, affective, and conative brand responses.

**RQ2**: Does prior brand use moderate the effect of interactive brand placement in a game on cognitive (TOMA), affective (brand image), and conative (behavioral intention) responses?

In addition to moderator effects of prior brand use and age, it might be expected that these two factors, in combination with exposure to interactive brand placement, lead to three-way interaction effects. It might be that younger children who have no prior experience with the brand are more vulnerable to persuasion by interactive brand placements than younger children who do have prior experience with the brand. In addition, these differences between users and non-users might be less profound in older children, as they have learned to utilize their knowledge about persuasion and to be critical about advertising. Because these assumptions have not yet been tested, we formulated the following research question:

**RQ3**: Do age, prior brand use, and exposure to an interactive brand placement in a game have a three-way interaction effect on cognitive (TOMA), affective (brand image), and conative (behavioral intention) responses?

**Method**

*Design*
The hypotheses and research questions were tested using a quasi-experimental design with two experimental conditions and a control group. Two independent groups of players were questioned at two different times. In the first experimental condition, players were questioned who were exposed to the game before the interactive brand placement was introduced. The players in the second experimental condition participated in the research two weeks after the interactive brand placement was introduced, which was four weeks after those in the first condition filled out the questionnaire. At the same time, players in the control condition, who were not exposed to the game at all, participated in the research.

The control group was questioned at the same time as the second experimental group to control for the effects of brand communication in the period between the two data collections. If the control group and the first experimental groups do not differ from each other on the dependent variables but there are differences between the two experimental groups, effects can be ascribed to the placement.

**Stimulus Material**

*The game “goSupermodel.”* GoSupermodel (GSM) is a simple role-playing game that is available for free online. GSM can be classified as a massively multiplayer online game (Steinkuehler & Williams, 2006). Game play amounts to assuming a model's role: Players can create a virtual model (avatar) that interacts with other virtual models. GoSupermodel is targeted at young girls and is available in 11 countries. The present study focused on the Dutch version, which is comparable to versions in other countries except for differences in the particular brands placed in the game. At the time of the experiment, 1.2 million virtual models had been created by girls using the Dutch version of goSupermodel. This illustrates the popularity of online games, and role playing games in particular among girls and women (Hartmann & Klimmt, 2006). The
aim of the game is social as well as competitive. In terms of the social goal of the game, players can communicate with other models, create social groups, post user generated content, and find new friends. On the competitive side, the aim is to earn as much points as possible by participating in modeling contests, dance competitions, designing clothes, and other contests. The more points you earn, the more popular your model becomes. In some of the contests, players can earn virtual money, so called G money. With the G money, players can buy clothes and accessories for their model or have virtual photo shoots.

*Interactive brand placement.* The interactive placement that was examined in the present study was for a large Dutch bank. In the virtual game environment of GSM, players were able to visit the bank’s office. At the starting page of the game, a clickable logo of the bank led to the bank’s office. In the bank’s office, players could open an account for their G money that enabled them to earn interest. A virtual employee of the bank, called Yvette, was present to answer questions about money, saving, and interest. This brand placement is highly interactive, because players could walk around in the bank’s office, talk to the employee and receive feedback, open an account, and earn interest.

*Procedure*

Via a link on the site of goSupermodel, the first experimental group, which was exposed to the game without the brand placement, was invited to fill out a questionnaire about the game. The respondents could click on a link on the website, to fill out the questionnaire. The respondents in the second experimental condition, who were exposed to the interactive brand placement in the game, were invited to fill out the questionnaire via a link on the site of goSupermodel two weeks after the bank’s office was introduced. Again, a direct link to the questionnaire was placed on the website. Nearly all of the respondents in the second condition
encountered the brand in the game (99% visited the virtual office of the bank). Those who did not were removed from the sample.

Because the measurements took place at two different points in time (before and after introduction of the bank in the game), the possibility existed that some respondents responded to both questionnaires, which would violate the design with two independent groups. Therefore, the respondents in the second condition who had responded to the first questionnaire were removed from the sample.

The respondents in the control condition were subscribers to a national panel that represents the Dutch population and is administrated by a research and consultancy company. Only the respondents who were not familiar with goSupermodel and who belonged to the same demographic group as the respondents in the experimental condition were invited via e-mail to voluntarily participate in the research. Thus, these respondents did not play goSupermodel and were not exposed to the brand placement. The control group was questioned at the same time as the second experimental group.

Before filling out the questionnaire, it was made clear that participation in the research was voluntary and that the girls could stop filling out the questionnaire anytime they wanted. In addition, the participants were told that the questionnaires were anonymous and would only be used for analyses by the researchers.

First, general questions about demographics and gaming behavior were posed. Questions about the attitude toward and use of goSupermodel followed. Next, questions about brand awareness, brand image, and behavioral intentions were posed. Finally, the girls were debriefed and thanked for their cooperation.

*Participants*
A total of 2748 girls between 10 and 17 years old ($M = 12.68, SD = 1.68$) participated in the research by filling out the online questionnaire. The game goSupermodel is targeted at girls and therefore, boys were removed from the sample ($n = 3$). More than one-third of the girls were in primary school (39%). The first condition included 1477 girls ($M_{\text{age}} = 12.40, SD = 1.47; 41\%$ users of the integrated brand, $SD = 0.49$), the second condition included 974 girls ($M_{\text{age}} = 12.86, SD = 1.65; 47\%$ users of the integrated brand, $SD = 0.50$), and the control condition included 297 girls ($M_{\text{age}} = 13.50, SD = 2.32; 30\%$ users of the integrated brand, $SD = .46$).

**Measures**

**Dependent variables.** General attitude toward the game was measured by asking respondents to grade goSupermodel on a scale ranging from 1 (*negative*) to 10 (*positive*), $M = 8.88, SD = 1.17$ (Van Reijmersdal et al., 2007; Yang & Roskos-Ewoldsen, 2007).

The cognitive response was operationalized as top of mind awareness (TOMA) and was measured by asking to write down all banks the girls knew in the sequence in which the banks came to mind (Gruber, 1969). If the name of the bank that was placed in the game was mentioned first, this brand was considered to have the highest TOMA, which was coded as 1; other answers were coded as 0 ($M = .58, SD = .49$).

To examine the affective response to the interactive brand placement, brand image was measured with the question “I think [bank name] is…” followed by 13 different characteristics, including friendly, modern, dedicated, and trendy, on a scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). These characteristics were based on the image that the bank aimed for by placing its brand in goSupermodel. A factor analysis showed that these items loaded on one factor (Eigenvalue = 8.88, $R^2 = .68$); scale items were averaged to create a single measure of brand image (Cronbach’s alpha = .86; $M = 4.68, SD = 1.53$).
The conative response (behavioral intention) toward the brand was measured on a scale ranging from 1 (*absolutely not*) to 4 (*absolutely yes*) by three questions, for example “Do you intend to open an account at [name bank]?” (Luarn & Lin, 2005). There was also an option, ‘do not know,’ this score was recoded into missing. Scale items were averaged to create a single measure of behavioral intent (Cronbach’s alpha = .83, $M = 2.47$, $SD = 0.90$).

**Background characteristics.** Several background characteristics were measured. Duration of membership in goSupermodel was measured on a scale ranging from 1 (*less than three months*), to 4 (*longer than 12 months*) ($M = 2.88$, $SD = 1.97$). Use of goSupermodel was measured by two questions, namely “How often do you play goSupermodel?” on a scale ranging from 1 (*less than one day a month*) to 5 (*six to seven days a week*) ($M = 4.45$, $SD = .80$) and “On average how much time do you spent playing goSupermodel each time?” on a scale ranging from 1 (*less than half an hour*) to 5 (*more than three hours*) ($M = 3.21$, $SD = 1.23$). We also measured the time spent on online gaming in general, by asking “How often do you play online games?” on a scale ranging from 1 (*almost never*) to 6 (*six to seven days a week*) ($M = 4.11$, $SD = 1.06$). In addition, age in years, level of education, and whether the respondents had an account at the bank in “real life” (prior brand use) were measured. Based on developmental research, age was recoded into three groups: 11-12 year olds (late elementary school), 13-14 (young teenagers), and 15-17 (older teenagers) (Spano, 2004; Valkenburg, 2004).

**Results**

**Randomization and Control for External Events**

The two experimental groups did not differ with respect to their use of goSupermodel and their use of online games. There were small but statistically significant differences between the experimental groups on some background characteristics (age, level of education, duration of
goSupermodel membership, and prior brand use, $p < .05$). To eliminate the effects of these background variables, they were included in the analyses when they correlated significantly with the specific dependent variable.

The experimental groups were questioned at two different points in time. To ascribe differences on the dependent variables between the experimental groups to the stimulus (the brand placement), the possible effects of external events in the time between measurements in the two experimental groups were tested. To do so, the control group was compared to the first experimental group with respect to the dependent variables. Because there was a large difference in sample sizes between these groups, the variance ratio was calculated to guarantee variance homogeneity (Field, 2005). For both Top of mind awareness and brand image, the variance ratio was smaller than 2 (1.01 and 1.60, respectively), thus homogeneity of variance between the control group and the first experimental groups is assumed for the dependent variables.

Logistic regression (for top of mind awareness) and analyses of variance showed that there were no differences between the group who played goSupermodel without the bank placement and the control group, with respect to TOMA, $\text{Exp}(B) = 1.04, B = .04, SE = .08, p = .62$, brand images, $F (1, 1385) = .266, p = .61, \eta^2 < .001$, and behavioral intentions toward the brand, $F (1, 521) = 0.49, p = .49, \eta^2 = .001$, (see Table 1). This means that the cognitive, affective and conative brand responses did not change over time for those who were not exposed to the brand placement. These effects held when controlling for differences in background variables between the two groups.

Before the main analyses for differences between the two experimental groups were conducted, variance ratios were again calculated to guarantee homogeneity of variance (Field,
2005). For all dependent variables, the variance ratios were lower that 1.65, which means that homogeneity of variance is assumed.

**Attitude toward the Game**

With respect to H1, ANCOVA with age and level as education as covariate showed that there is a significant but small effect of brand placement on attitude toward the game, $F(1, 2402) = 29.67, p < .001, \eta^2 = .01$. The results showed that the girls liked the game better with the brand placement ($M = 9.03, SD = 1.00$) than without the brand placement ($M = 8.79, SD = 1.26$).

**Brand Effects**

H2a stated that interactive brand placement in a game has a positive effect on top of mind awareness. Logistic regression analysis with attitude toward the game, brand use, and level of education as covariates indeed showed an effect of brand placement on TOMA, $\exp(B) = 3.75, B = 1.32, SE = .11, \text{Wald (1)} = 138.93, p < .01$. As Table 2 shows, over three quarters of girls who played the game with brand placement mentioned the placed bank first, whereas less than half of the girls who played the game without the brand placement mentioned the bank first. With respect to H2b, ANCOVA, with level of education, attitude toward the game, and brand use as covariates, showed an effect of brand placement on brand image, $F(1, 1998) = 161.26, p < .001, \eta^2 = .08$. As expected, Table 2 shows that playing the game with brand placement leads to a significantly more favorable brand image. With respect to behavioral intention (H2c), ANCOVA, with level of education, attitude toward the game, age and brand use as covariates, showed a similar effect, $F(1, 916) = 70.45, p < .001, \eta^2 = .07$: The girls who played the game with the brand placement showed higher behavioral intentions toward the brand than the girls who were not confronted with the bank in the game, see Table 2.

**Moderation Analyses**
To examine RQ1, RQ2 and RQ3 for TOMA, logistic regression analysis with the experimental conditions, age, prior brand use and the two and three-way interactions between these independent variables and attitude toward the game and level of education as covariates were conducted. These analyses showed that there were no significant two- or three-way interaction effects.

To test RQ1, RQ2 and RQ3 for brand image, ANCOVA was performed with the experimental conditions, age, prior brand use and the two and three-way interactions between these independent variables, and attitude toward the game and brand use as covariates were conducted. This showed a significant but very small interaction effect only between prior brand use and the conditions $F(1, 1990) = 4.27, p < .05, \eta^2 = .002$. Figure 1 shows that users of the brand had more positive brand images than non-users, but this difference was smaller when girls encountered the brand in the game. Analysis of the interaction effect showed that non-users’ brand images were stronger affected by the brand placement ($F(1, 1990) = 85.61, p < .01, \eta^2 = .04; M= 3.98, SD = 1.53$ vs. $M = 5.06, SD = 1.36$), than users’ brand images ($F(1, 1990) = 33.34, p < .01, \eta^2 = .02; M= 4.94, SD = 1.49$ vs. $M = 5.61, SD = 1.16$). The figure also shows that non-users of the brand who were exposed to the interactive brand placement had the same brand image as users of the brand who were not exposed to the brand placement. Thus, for brand image, virtual use among non-users of the brand lead to the same brand images as real usage.

To test the research questions for behavioral intention, the same analysis was performed with attitude toward the game and level of education as covariates. There was no interaction effect between the experimental conditions and age, but there was a significant interaction effect between the conditions and prior brand use, $F(1, 908) = 25.95, p < .01, \eta^2 = .03$. However, this effect was qualified by a three-way interaction between the conditions, age and prior brand use, $F$
Figure 2 shows the mean scores for the gamers who were non-users of the brand. It shows that these gamers showed significantly higher behavioral intentions when confronted with the brand placement than when not confronted with the brand placement, and differences between the experimental conditions are significant for all groups of non-users of the brand at $p < .001$. In addition, the youngest girls (non-users) showed significantly more intention after exposure to the brand placement ($M = 2.68, SD = 0.84$) than the oldest girls ($M = 2.16, SD = 0.81, F(2, 908) = 3.62, p < .05, \eta^2 = .008$), although the effect size is very small. This difference was not significant when the girls were not exposed to the brand placement ($M_{\text{youngest girls}} = 1.82, SD = 0.68$ versus $M_{\text{oldest girls}} = 1.55, SD = 0.56, F(2, 908) = 0.96, p = .38, \eta^2 = .002$).

This means that the youngest girls who are non-users of the integrated brand are more influenced by the interactive brand placement in the game than the oldest girls who were also non-users. For users there were no significant differences between the age groups, not for those who were not exposed to the brand placement, $F(2, 908) = 1.61, p = .20, \eta^2 = .004$, and nor for those who were exposed to the brand placement, $F(2, 908) = 0.64, p = .53, \eta^2 = .001$, see Figure 3.

**Conclusion**

The present study adds to the literature on brand placement in games by investigating the effects of an (1) interactive brand placement in (2) an online role playing game on (3) children’s (4) attitude toward the game and their cognitive, affective, and conative brand responses. In addition, (5) moderators of these effects were examined. Four main conclusions emerge from the research.

First, we found that interactive brand placement has a positive effect on top of mind awareness (cognition), brand image (affect), and behavioral intention (conation). These findings suggest that interaction with a brand in a virtual gaming environment influences information
processing, attitude formation, and the intent to act. Earlier research has predominantly focused on static, non-interactive brand placements in games, and has examined mainly cognitive and affective responses. Our study was the first to examine the effects of interactive brand placements in games on all three types of children’s brand responses.

Second, our results show that attitude toward the game itself is positively affected by brand placement. This seems to suggest that the negative effects of static brand placements on attitudes toward the game found in the study of Mau et al. (2008) do not hold for interactive brand placements. Our findings suggest that adding enjoyable, interactive branded components to a game can influence the attitude toward the game positively.

Third, the results show that prior brand use moderates the effects of interactive brand placements in games on brand image and behavioral intention. Children who have no prior experience with the brand were more influenced by the interactive brand placement. The majority of earlier research on the effects of brand placement in games has not differentiated between different groups of players. Previously, it was assumed that the effects of (static) brand placements hold for all players. Our study, however, is the first to show that prior brand use is an important moderator of the effects of interactive brand placement in games. Our findings suggest that interaction with a brand in a virtual setting has the same effect as a real-life experience. The effects on affective responses indeed show that the brand image of non-users who interacted with the brand in the game was the same as the brand image of users who did not interact with the brand.

These results are partially in line with findings from a study on brand placement in television series, which showed that only non-users were affected by watching the brand placements (Barthel Sheehan & Guo, 2005). Our results add to these findings by showing that
users are also influenced in the case of an interactive placement in a game, although less strongly than non-users. The difference in results between the present study and Barthel, Sheehan and Guo’s study (2005) can be explained by the interactivity aspect of the brand placement in the present study. The (virtual) brand experience seems to be much more powerful when people can interact with a brand, receive feedback, and experience the product (Molesworth, 2006) than when they only watch how the brand performs in a television show, as was the case in Barthel Sheehan and Guo’s study. Thus, our findings show that interacting with the brand in an enjoyable game setting can even influence those players who already have strong cognitions, affect, and conation based on their own experiences.

Fourth, the present study shows that age does not moderate the effects of brand placement on brand responses. However, our results do show that the effect on behavioral intention (conation) is moderated by both prior brand use and age. Younger children who have no prior experience with the brand are more influenced by the brand placement in the game than older children who have no brand experience. These findings suggest that younger children, especially when they have no prior experience with the brand, can more easily be swayed to action by brand placements in games than older children. An important implication of this finding is that younger children are relatively more vulnerable to persuasion from brands in online games.

Our first suggestion for future research is related to the responses that were studied. Although our design was extensive incorporating multiple brand responses (cognitive, affective, and conative), future research might include even more extensive designs by focusing on other cognitive, affective and conative responses. For example, we studied behavioral intention as a conative response, but future research might also focus on buying behavior.
The second suggestion for future research concerns the sample studied. The present study examined brands integrated in a game targeted at young girls. However, our findings might not generalize to boys. Mallinckrodt and Mizerski (2007) showed that boys are more aware of the persuasive intent of advergames than girls. This might influence their brand responses. Therefore, future research is needed to be able to generalize the findings of the present study to boys and to detect differences in brand responses between boys and girls.

The most important theoretical contribution of this study is that it shows that effects of interactive brand placement in games are moderated by individual characteristics, such as prior brand use and age. Therefore, theoretical and empirical models of brand placement effects should not only take into account brand placement or game characteristics, but also the moderating influence of individual characteristics.

The findings of our study suggest that interactive brand integration in games offer advertisers an opportunity to influence children and thereby improve sales. For legislators and parents, however, our finding might be a cause for concern. Our study shows that children are vulnerable to influence by commercial parties who have integrated their messages into online games. Our study suggests that the group that is commercially most interesting for advertisers, namely non-users of specific brands or product, can easily be influenced by brand integrations in games. Especially younger players who have no previous experience with the brand seem to be willing to use the products they played with in games. Therefore, both parents and legislator should think about the risks that children are exposed to when playing online games that include brand integration.

Possible solutions for these risks are prohibiting sponsoring of online games directed at children. A more feasible solution might be to educate both parents and children about the aims
and tactics of advertisers who integrate their brand into online games. The assumption is that understanding persuasive techniques can help children and adults to guard themselves from persuasion. However, the effectiveness of such education in reducing susceptibility to persuasion is still uncertain (Livingstone & Helsper, 2006; Rozendaal, Buijzen, & Valkenburg, 2009).
References


Footnotes

1 As the sample size is large, small differences between in group variances can produce significant Levene’s test of homogeneity of variance. Therefore, variance ratios are used to test the assumption of homogeneity of variance (Field, 2005).
Table 1

*Controlling for External Events: Differences between the Control Group and the First Experimental Group*

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group 1</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of Mind Awareness¹</td>
<td>.49⁺ (.50)</td>
<td>.44⁺ (.50)</td>
</tr>
<tr>
<td>Brand Image²</td>
<td>4.38⁺ (1.59)</td>
<td>4.24⁺ (1.24)</td>
</tr>
<tr>
<td>Behavioral Intention³</td>
<td>2.25⁺ (0.90)</td>
<td>1.89⁺ (0.74)</td>
</tr>
</tbody>
</table>

*Note:* Means scores with standard deviations between parentheses.

¹ Scale: 0 (Bank from the game not mentioned first) – 1 (Bank from the game mentioned first),

² Scale: 1 (*strongly disagree*) – 7 (*strongly agree*)

³ Scale: 1 (*definitely no*) – 4 (*definitely yes*).
Table 2

*Effects of Brand Placement on Dependent Variables*

<table>
<thead>
<tr>
<th>Presence of Brand Placement</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of Mind Awareness¹</td>
<td>.49ᵃ (.50)</td>
<td>.76ᵇ (.43)</td>
</tr>
<tr>
<td>Brand Image²</td>
<td>4.38ᵃ (1.58)</td>
<td>5.32ᵇ (1.30)</td>
</tr>
<tr>
<td>Behavioral Intention³</td>
<td>2.25ᵃ (0.89)</td>
<td>2.82ᵇ (0.80)</td>
</tr>
</tbody>
</table>

*Note:* Means scores with standard deviations between parentheses.

¹ Scale: 0 (Bank from the game not mentioned first) – 1 (Bank from the game mentioned first)

² Scale: 1 (*strongly disagree*) – 7 (*strongly agree*)

³ Scale: 1 (*definitely no*) – 4 (*definitely yes*).
Figure 1

*Interaction Effect of Prior Brand Use and Experimental Condition on Brand Image*
Figure 2

*Interaction Effect between Age and Experimental Condition for Non-users of the Brand on Behavioral Intention*
Figure 3

*Interaction Effect between Age and Experimental Condition for Brand Users on Behavioral Intention toward the Brand*