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Brand placements in video games: How local in-game experiences influence brand attitudes

Moritz Ingendahl[1,2] | Tobias Vogel[3] | Alexander Maedche[4] | Michaela Wänke[1]

[1]Department for Consumer and Economic Psychology, University of Mannheim, Mannheim, Germany

[2]Social Cognition Lab at Ruhr University Bochum, Bochum, Germany

[3]Department for Social Sciences, Darmstadt University of Applied Sciences, Darmstadt, Germany

[4]Institute of Information Systems and Marketing (IISM), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

Correspondence

Moritz Ingendahl, Department for Consumer and Economic Psychology, University of Mannheim, Mannheim, Germany.
Email: moritz.ingendahl@ruhr-uni-bochum.de

Present address

Moritz Ingendahl, Social Cognition Lab at Ruhr University Bochum, Bochum, Germany.

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Abstract

Brand placements are omnipresent in video games, but their overall effect on brand attitudes is small and varies substantially between studies. The present research takes an evaluative conditioning perspective to explain when and how brand placements in video games influence brand attitudes. In two experiments with a 3D first-person video game, we show that only brands encountered during positive in-game experiences benefit from the placement, but not those encountered during negative in-game experiences. Building on the cognitive processes underlying evaluative conditioning, we also show that brand attitudes largely depend on the memory for the pairing of a brand with positive/negative in-game experiences. Pairing memory and thus also evaluative conditioning effects increase when players attend to the pairing of brands and positive/negative experiences, for example, when such pairings are a central part of the game's storyline. Overall, our findings show that evaluative conditioning and its cognitive mechanisms can be utilized to explain and predict advertising effects in applied settings, such as brand placements in video games.

KEYWORDS

advertising, affect transfer, brand attitudes, brand placement, evaluative conditioning, memory, video games

1 | INTRODUCTION

Brand placements, the "paid inclusion of branded products or brand identifiers through audio and/or visual means within mass media programming" (Karrh, 1998, p. 33), have become increasingly popular in video games (Guo et al., 2019). As a famous example of such brand placements in games, Monster Energy drinks were placed in 2019s award-winning adventure *Death Stranding*. In this game, Monster Energy can be consumed to increase the protagonist's stamina. Even in politics, video games provide a platform for advertising, as demonstrated by Barack Obama billboards along the tracks of the racing game *Burnout Paradise* or ads for the Biden/Harris Campaign 2020 in *Animal Crossing*. An extreme form of advertising in video games are the so-called advergames, a whole genre of games with the sole purpose of advertising specific brands (Cauberghe & De Pelsmacker, 2010). Worldwide, the market revenue of advertising in video games was around 6.71 billion $ in 2021, and is predicted to be twice as large in

Moritz Ingendahl and Tobias Vogel contributed equally to the study.

2028 (Vantage Market Research, 2022), reflecting the significance of this media for marketing and advertising.

One reason for the wide use of in-game brand placements is the expectation that they improve brand attitudes (Wise et al., 2008). However, this expectation seems to clash with the empirical reality: A recent meta-analysis shows that the effect of brand placements in video games on brand attitudes is small and heterogenous ($r_c = 0.11$; van Berlo et al., 2021). Some studies even show negative effects (e.g., Mackay et al., 2009; Mau et al., 2008), suggesting that in-game placements can even harm a brand. Therefore, it is essential both from a scientific and an applied perspective to further understand the processes and moderating conditions of brand placement effects.

The present research contributes to this reseach gap by offering a parsimonious explanation why the overall effect of brand placements on brand attitudes is small and heterogenous. We do so by building on evaluative conditioning research (De Houwer et al., 2001). Over the last 40 years, evaluative conditioning research has produced many insights into how and when presenting a neutral stimulus (e.g., a brand) in the context of a valenced stimulus (e.g., in-game experiences) changes the evaluation of the presented stimulus (Hofmann et al., 2010). Looking at brand-placement effects from an evaluative conditioning perspective provides several advantages: First, it might explain why previous research has found mixed results regarding whether brand placements in video games increase brand attitudes. Second, it allows for specific hypotheses and defines the conditions when brand placements will lead to positive brand attitudes. Third, by doing so, it offers straightforward recommendations on how to place brands in video games effectively.

2 | VIDEO GAMES, EVALUATIVE CONDITIONING, AND BRAND ATTITUDES

The central assumption underlying the hypothesis that in-game brand placements lead to more favorable brand attitudes is that playing video games is usually a fun and joyful experience. This positive affect is expected to influence brand attitudes positively (Grigorovici & Constantin, 2004; Nelson & Waiguny, 2012; Roettl et al., 2016; van Berlo et al., 2021; Waiguny et al., 2012, 2013; Wise et al., 2008). Such reasoning often builds on the attitude-towards-the-advertisement concept 1986 (MacKenzie et al., 1986), according to which the attitude towards the advertisement transfers to the advertised brand. Many researchers consider the game as an advertisement and consequently expect that the attitudes toward the game influence brand attitudes (Martí-Parreño et al., 2013; Mau et al., 2008; Wise et al., 2008).

Another framework that has been discussed is evaluative conditioning (e.g., Waiguny et al., 2013). Evaluative conditioning is an empirical effect defined as the change in the liking of a conditioned stimulus due to its joint co-occurrence with other positive/negative unconditioned stimuli (De Houwer et al., 2001; Hofmann et al., 2010). It is presumed to be a major influence in advertising effectiveness (Allen & Janiszewski, 1989; Sweldens et al., 2010). For example, a brand (conditioned stimulus) is presented with a celebrity endorser (unconditioned stimulus), and as a result, brand attitudes become more favorable. Using the evaluative conditioning perspective, some researchers argued that a video game itself might serve as a positively valenced stimulus that increases the liking for the placed brand (e.g., Waiguny et al., 2013). Yet, given the mixed evidence regarding brand placement effects (van Berlo et al., 2021) it may be worthwhile to take a closer look at the precise conditions for evaluative conditioning effects to occur. These conditions involve the timing of the pairing, and the memory of the pairing.

2.1 | The timing of the pairing

Although theorizing on evaluative conditioning is not explicit about how to define an unconditioned stimulus, evaluative conditioning is—by definition—an effect due to the joint *co-occurrence* of stimuli (Hofmann et al., 2010). That is, the conditioned and the unconditioned stimulus must appear in close temporal proximity and must not be separated by more than a few seconds (e.g., Gast et al., 2016). For brand placements in video games, this implies that it is less relevant how the overall game is experienced (e.g., whether the game as a whole is liked), but primarily which particular in-game experiences occur in the very moment the brand is presented.

Importantly, these momentary in-game experiences are not necessarily positive, even if the overall game is enjoyed. Video games are a multifaceted media, and the elicited experiences vary tremendously throughout a game (e.g., Bender & Sung, 2021; Ravaja et al., 2008). Video games may, in fact, resemble an emotional rollercoaster: For instance, in a racing game like *Burnout Paradise*, the position in the race constantly changes, with players taking the lead and falling back in rapid succession. A player may pass two competitors at once by taking a shortcut in one second but be knocked off course in the next second. Thus, the affective experience changes within seconds, and analogously, the presented brands will co-occur momentarily with positive or negative in-game experiences. Accordingly, from the definition of evaluative conditioning and the dynamic nature of video games follows that brand placements in video games do not per se lead to more favorable brand attitudes. Instead, the effect of a brand placement on brand attitudes depends on the valence of the in-game experience at the very moment the brand is encountered in the game.

H1: Brands encountered during positive in-game experiences are evaluated more favorably than brands encountered during negative in-game experiences (evaluative conditioning effect).

2.2 | The role of pairing memory

With evaluative conditioning as a framework, it is also possible to predict under which circumstances brand placements have the strongest influence on brand attitudes.

Evaluative conditioning is most likely a multiprocess phenomenon (Hofmann et al., 2010; Sweldens et al., 2010). Still, one well-supported mechanism is that a link between the conditioned stimulus (e.g., the brand) to the unconditioned stimulus (e.g., the celebrity endorser) is established in memory (e.g., Gast, 2018; Sweldens et al., 2010). Upon a future encounter of the conditioned stimulus (e.g., the brand), the memory representation of the unconditioned stimulus (e.g., the celebrity endorser) is retrieved, leading to the positive evaluation of the brand. Consistent with such reasoning, evaluative conditioning effects largely depend on the memory for the pairing of the conditioned and unconditioned stimuli (Hofmann et al., 2010; Hütter et al., 2012; Sweldens et al., 2014). Although there are also some findings on evaluative conditioning without memory for the pairing (Hütter & Sweldens, 2013; Hütter et al., 2012; Sweldens et al., 2010), the overall evidence clearly speaks for stronger effects in case of pairing memory (Hofmann et al., 2010).

For brand placement in video games, this means that the following requirements must be met for strong evaluative conditioning effects: Players must not only remember that a brand was placed in a game, but moreover, the specific affective experience with which the brand was encountered. Thus, we expect:

H2: Evaluative Conditioning effects for brand placements in video games (H1) increase with memory for the pairing of brands with positive/negative in-game experiences.

2.3 | Attention, pairing memory, and brand centrality

Memorizing the pairing of a brand with a positive/negative in-game experience requires at least some amount of attention (e.g., Pleyers et al., 2009). This can be a challenge for placements in video games: According to the limited capacity model of motivated mediated message processing (Lang, 2000), attention is a finite resource devoted mainly to primary tasks. This leaves only a small residue for secondary tasks. In video games, playing the game is the primary task, whereas processing the brands and their surrounding contexts is often secondary (Grigorovici & Constantin, 2004; Lee & Faber, 2007), resulting in weak pairing memory. Accordingly, evaluative conditioning effects on brand placements will be weak in many gaming situations.

One straightforward strategy to direct players' attention to the pairing of brands and in-game experiences is to make processing the brands a primary task. Specifically, one could integrate the brands into the game's story and make them a *central* part of the gameplay (cf. Nelson & Waiguny, 2012). Brand centrality can be defined as the extent to which "a brand takes a pivotal role and is placed as a central part" in the gameplay (Hofman-Kohlmeyer, 2021, p. 75). Often, it is conceptualized as the "proximity/closeness of a brand to the primary task" within a game (Jeong et al., 2011, p. 62; Jeong & Biocca, 2012). In our introductory examples, the Barack Obama billboards were peripheral to the core gameplay of the racing game, thus being unlikely to be noticed and remembered by many players. In contrast, the Monster Energy drinks in Death Stranding were central to the game because consuming them increases the characters' stamina. In extreme cases, brands are even the main element of the game, as in advergames (Cauberghe & De Pelsmacker, 2010; Nelson & Waiguny, 2012). For instance, in the classic advergame Pepsi Man, the player's main task is to collect as many Pepsi cans as possible and bring them to thirsty people. Such central placements are more likely to be recalled later (Cauberghe & De Pelsmacker, 2010; Chaney et al., 2018; Jeong & Biocca, 2012; Van Reijmersdal et al., 2012). Although previous studies did not assess memory specifically for pairings of brands and in-game experiences, we expect that it also benefits from brand centrality.

H3: Players' pairing memory for brands and in-game experiences is stronger when brands play a central (vs. peripheral) role in the gameplay.

Logically, if evaluative conditioning effects for brands placed in video games depend on pairing memory and pairing memory increases with brand centrality, then brand centrality should also enhance evaluative conditioning effects:

H4: Evaluative conditioning effects on brands placed in video games are stronger when brands play a central (vs. peripheral) role in the gameplay.

Our hypotheses are depicted in Figure 1.

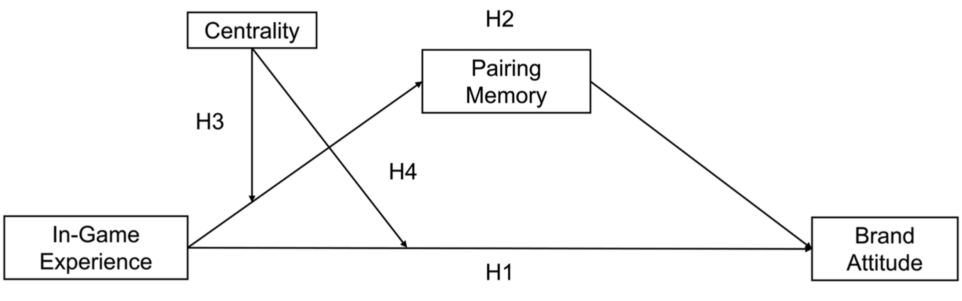


FIGURE 1 Overview over our research model

2.4 | Overview over the experiments

Two experimental studies tested the postulated hypotheses using a three-dimensional (3D) first-person video game with placements of fictional brand names. In both studies, players encountered some of the brands during positive in-game experiences and others during negative experiences. In both studies, we manipulated how central the brands were to the gameplay. In Study 1, we assessed brand attitudes and pairing memory to conduct a mediation analysis. Study 2 further scrutinized the influence of pairing memory using a well-established process-dissociation technique from evaluative conditioning research (Hütter et al., 2012).

3 | STUDY 1

3.1 | Method

3.1.1 | Design and sample

This experiment had a 2 (centrality: central vs. peripheral; between-participants) × 2 (experience: positive vs. negative; within-participants) mixed design. We based our sample sizes on an a priori power analysis conducted with GPower (Faul et al., 2007), assuming a mixed analysis of variance (ANOVA). We used the basic evaluative conditioning effect of $d = 0.52$ ($\sim f = 0.25$) found in the meta-analysis of Hofmann et al. (2010) as the first indicator of the effect size for H1. We doubled the resulting $N = 34$ ($\beta = 0.2$, $\alpha = 0.05$) to prepare for the case that effects only emerged if brands were central to the gameplay. Hence, $N = 78$ students (74.4% female, $M_{age} = 22.36$) from a local university participated in exchange for course credits and the possibility to win one of three 10€ amazon vouchers.

3.1.2 | The game

We created a new online 3D first-person game for this experiment, which we called MarsLab 3D. Screenshots of the game can be found in Figure 2, and more detailed technical information on the game is provided in Supporting Information A.

Once the game was loaded, an instruction screen explained the scenario to the players. The player's task was to save the planet Earth from an epidemic. A medical research base on the planet Mars stored a curing serum. The player should collect as many containers with

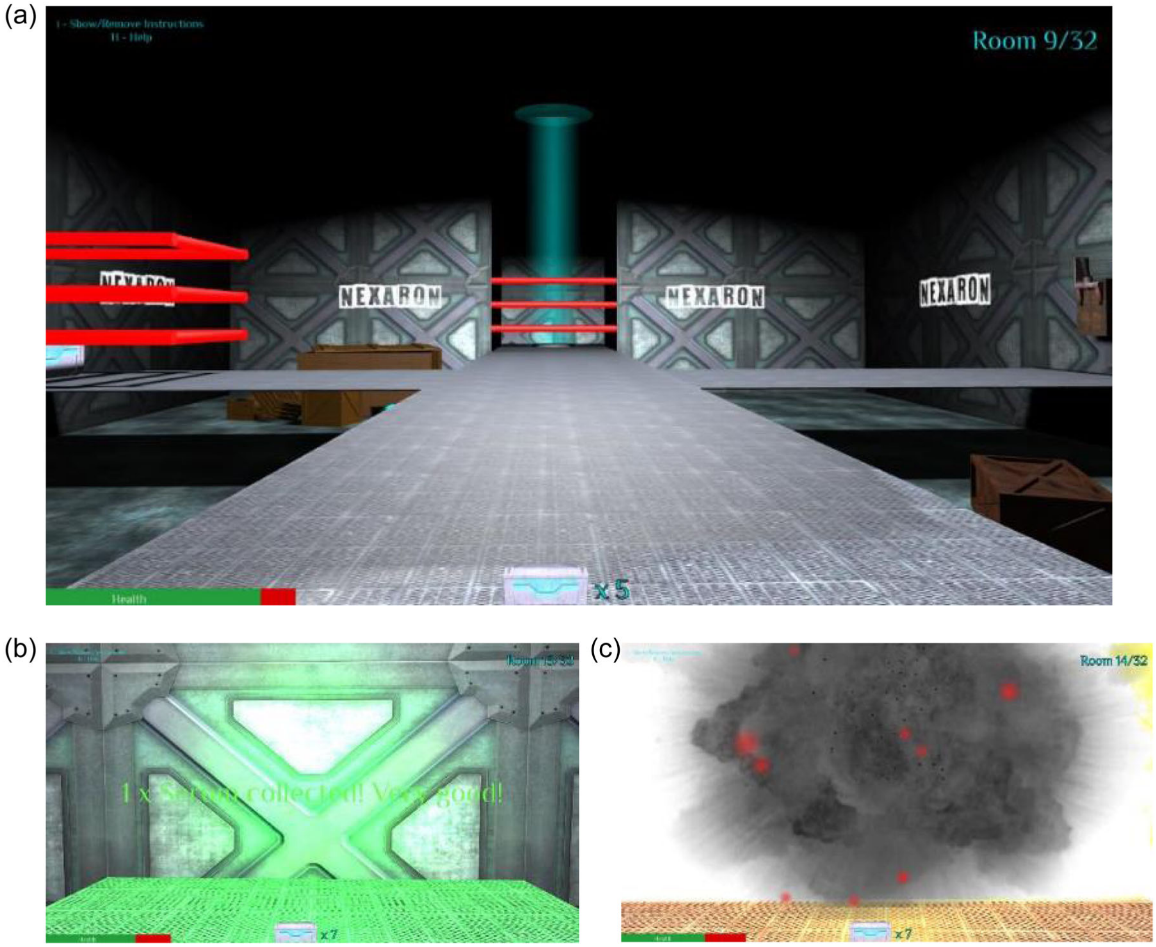


FIGURE 2 Screenshots from the Game. Screenshots from the game (a) when entering a storage room, (b) when collecting serum, and (c) when a container exploded. With each explosion, the life bar was reduced, and with each collected serum a counter was updated.

serum as possible. Several storage rooms with serum containers had to be passed on the way to the spaceship. But as the serum was of varying quality, the containers could explode in some rooms. Depending on the brand centrality condition, additional information was presented and highlighted in the instructions (see Independent Variables). The full instructions can be found in Supporting Information A.

After reading these instructions, the players had to pass through 32 storage rooms. Players had to navigate on a gangplank toward a serum container in each room. Upon opening, the player either collected a serum or the container exploded (Figure 1b,c). Once the player had opened the container, the player could use a teleporter to get to the next storage room. After 32 rooms, an endscreen announced that the player would now fly to Earth to save humankind, and the player was directed to a follow-up questionnaire (see Dependent Variables).

In each room, one fictitious brand name was displayed in six places (see Figure 2a). A pilot study (see Supporting Information A) had identified six fictitious brand names (e.g., STAREBO, DEMADOS) as neutral in liking. For each participant, two of these brand names were randomly chosen as the brand names for the positive in-game experience condition, two for the negative in-game experience condition, and the other two were not presented during the game but served as a neutral baseline in the brand evaluations. Players encountered each of the four conditioned brands eight times (in eight different rooms), and the sequence in which a player went through the 32 rooms was randomized for each player. This random selection of brand names and random sequence of rooms for each participant eliminated all possible confounds of brand names and order of experiences.

3.1.3 | Independent variables

In-game experience. For brands encountered in the positive in-game experience condition, the container held unspoiled serum in 75% (6/8) of the rooms where that specific brand was displayed on the walls and only exploded in 25% (2/8) of the rooms (see Figure 2 for screenshots). For brands encountered in the negative in-game experience condition, the container exploded in 75% of the rooms and held unspoiled serum in 25%. We used 75%/25% instead of 100/0% probabilities to increase the external validity of our research, as in many gaming situations brands will not occur exclusively with positive/negative experiences. Using 75%/25% stimulus distributions is sufficient for evaluative conditioning effects (e.g., Peters & Gawronski, 2011).

Brand centrality. In the peripheral condition, participants were merely instructed to hurry as humankind needed the serum as fast as possible. The brands were not mentioned at all. In the central condition, participants were informed that the walls displayed the brands that had produced the specific container with serum. As players were motivated to avoid storing any spoiled serum in the future, they should memorize which brand had produced spoiled serum. After the first room, participants were once more given these instructions to remind them of their task.

3.1.4 | Dependent variables

The pregame and postgame questionnaires were implemented in Sosci Survey (Leiner, 2019). After providing informed consent, participants were directed to the game. After finishing the game, participants were redirected to the questionnaire, which assessed the following variables in this order:

First, brand attitudes were assessed. Participants rated the four brands displayed in the game and the two undisplayed baseline brands according to how much they spontaneously appealed to them on a slide bar from 1 (very negative) to 101 (very positive). The order of the brands was randomized for each participant. Next, brand memory and pairing memory were assessed. To assess brand memory, participants had to estimate how many times each of the six brands had been presented in the game (0–8). For pairing memory, participants had to give probability judgments (0%–100%) on how many times the container had exploded, given a specific name was shown in the room. Next, we assessed whether participants had paid attention to the centrality instruction. Participants had to indicate their specific task by choosing one of four alternatives, among them the actual tasks of the central and the peripheral condition. As it was essential for the centrality manipulation that participants were aware of their task, we excluded seven participants who did not answer this question correctly. Therefore, all analyses in the result section were run with $N = 71$ participants.[1]

Afterward, we assessed three self-developed scales as a manipulation check for the centrality manipulation. For convergent validity, four items measured how much players had paid attention to the brands in the game (brand attention, $\alpha = 0.84$). For discriminant validity of our manipulation, game affinity ($\alpha = 0.80$) contained four items on how well participants could handle the controls and whether they had previous experience with (similar) computer games. Game liking ($\alpha = 0.91$, two items) measured how much they liked the game or had fun while playing. All items ranged from 1 to 7 and were presented in random order. Exploratory factor analyses showed a reliable loading pattern for three factors (see Supporting Information A). Last, participants answered several technical questions about their user behavior (e.g., whether they had experienced technical problems or used a mouse or a touchpad).

3.2 | Results

3.2.1 | Manipulation check

As intended by the manipulation, brand attention was higher in the central condition than in the peripheral condition, $M_{central} = 5.18$, $M_{peripheral} = 3.63$, $t(69) = 4.23$, $p < 0.001$. As predicted, the two conditions did not differ in game liking or game affinity, all $ts < 1.02$, all $ps > 0.312$.

[1]Note that all results in both studies fully replicate without any data exclusions (see https://doi.org/10.17605/OSF.IO/QKHTS for data and analysis scripts).

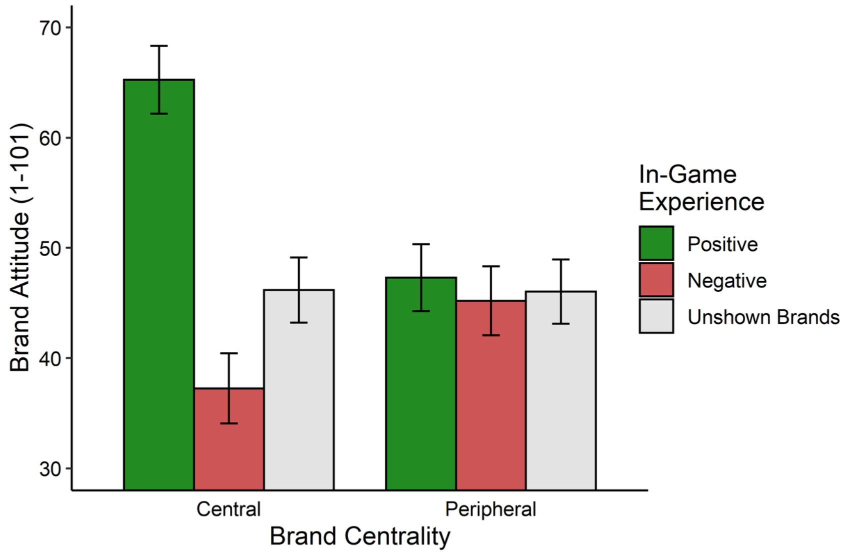


FIGURE 3 Brand attitude by in-game experience and centrality in Study 1. Error bars represent the standard error.

TABLE 1 Post hoc Tukey tests in both studies

		Brand attitude (Study 1)			Presentations (Study 1)			Explosion probability (Study 1)			Brand attitude (Study 2)		
Centrality	**Comparison**	*t*	*P*	*d*	*t*	*p*	*d*	*t*	*p*	*d*	*t*	*p*	*d*
Central	Positive–Negative	6.11	<0.001	0.74	0.49	.876	0.06	−4.88	<0.001	−0.59	8.12	<0.001	0.82
	Positive–Unshown	4.16	<0.001	0.50	15.84	<0.001	1.91						
	Negative–Unshown	−1.88	0.152	−0.23	14.18	<0.001	1.71						
Peripheral	Positive–Negative	0.47	0.887	0.06	1.24	0.433	0.15	−0.93	.355	−0.11	2.22	0.029	0.22
	Positive–Unshown	0.29	0.958	0.03	9.84	<0.001	1.18						
	Negative–Unshown	−0.18	0.982	−0.02	8.09	<0.001	0.97						

Note: *Df* = 69 (98) for all comparisons in Study 1 (2). *d* = Cohen's *d*.

3.2.2 | Brand attitudes

We subjected the brand attitudes to a mixed ANOVA in the R package afex (Singmann et al., 2020) with Greenhouse-Geisser corrections and follow-up Tukey tests in the emmeans package (Lenth, 2019). The mean brand attitudes are shown in Figure 3. As expected (H1), brands encountered during positive in-game experiences were evaluated more positively than brands encountered during negative in-game experiences (see Figure 3), $F(2, 137.74) = 11.13$, $p < 0.001$, $\eta^2_p = 0.139$. Consistent with H4, this effect was moderated by centrality, $F(2, 137.74) = 8.28$, $p < 0.001$, $\eta^2_p = 0.107$. Post hoc comparisons revealed evaluative conditioning effects only in the central but not in the peripheral condition (see Table 1). The centrality main effect was not significant, $F(1, 69) = 2.56$, $p = 0.114$, $\eta^2_p = 0.036$.

3.2.3 | Brand memory and pairing memory

We ran analogous models with brand memory and pairing memory. The results are displayed in Figure 4 and Table 1. Overall, participants could distinguish between shown and unshown brands in the estimated number of brand presentations, $F(1.84, 126.79) = 217.52$, $p < 0.001$, $\eta^2_p = 0.759$, thus showing robust brand memory. Those estimates were more accurate when brands were central (see Figure 4) as reflected by the interaction, $F(1.84, 126.79) = 14.73$, $p < 0.001$, $\eta^2_p = 0.176$. The main effect of centrality was also significant, $F(1, 69) = 5.47$, $p = 0.022$, $\eta^2_p = 0.073$.

Next, we analyzed the effects on pairing memory.[2] For brands in which an explosion occurred in 75% of the encounters (negative in-game experience), participants estimated a higher explosion probability than for brands in which containers only exploded in 25% (positive in-game experience), $F(1, 69) = 17.07$, $p < 0.001$, $\eta^2_p = 0.198$. In line with H3, pairing memory was more accurate when brands were central, $F(1, 69) = 7.98$, $p = 0.006$, $\eta^2_p = 0.104$., and only above chance in the central condition (see Table 1). Estimates were also overall higher in the central condition, $F(1, 69) = 6.87$, $p = 0.011$, $\eta^2_p = 0.091$.

[2]As the probability judgment of an explosion is logically undefined if a brand was not shown in the game, we excluded unshown brands from this analysis.

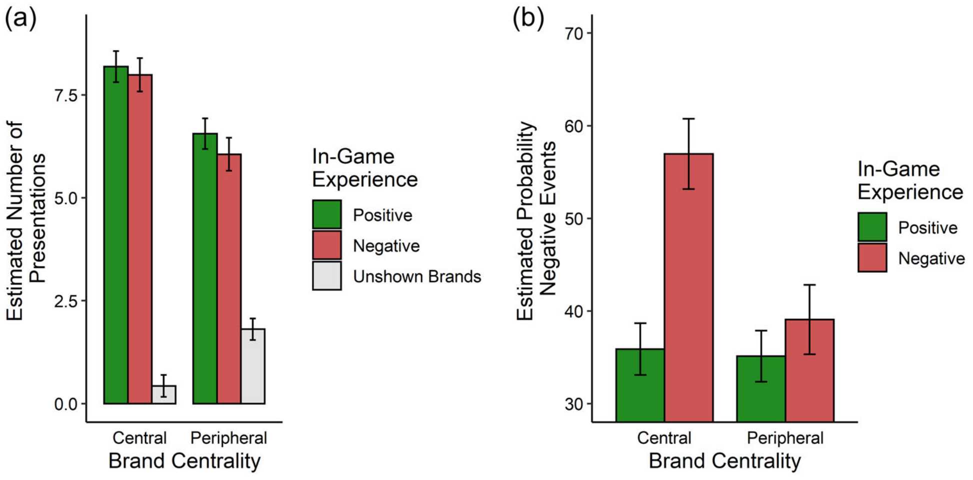


FIGURE 4 Estimated number of brand presentations (a) and estimated probability of negative events (b) by in-game experience and centrality in Study 1. The correct number of presentations was 8 each for positively/negatively conditioned brands and 0 for unshown brands. For the probability judgments, the correct answers were 25 for positively and 75 for negatively conditioned brands. Error bars represent the standard error.

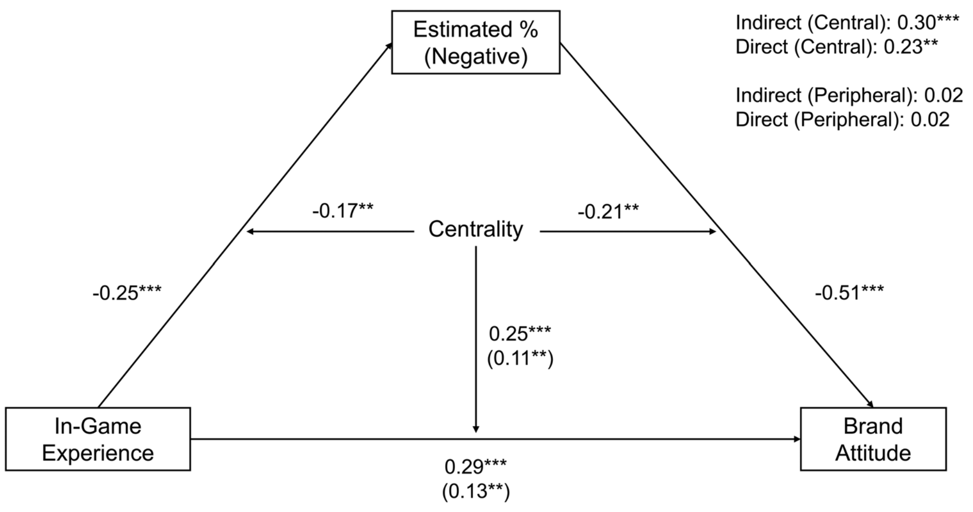


FIGURE 5 Regression coefficients from the mediation model of Study 1. The values in the parentheses refer to the full mediation model when controlling for the mediator. In-game experience (positive = 1; negative = −1) and Centrality (central = 1; peripheral = −1) were effect-coded, the other variables were standardized at the grand mean. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

3.2.4 | Mediation analysis

To further test the role of pairing memory (H2), we conducted a multilevel moderated mediation analysis with the probability estimates as a mediator in lavaan (Rosseel, 2012). All models had random intercepts for participants. Both brand attitudes and probability estimates were standardized (grand mean). The results are visualized in Figure 5; detailed results are provided in Supporting Information B.

As expected, the in-game experience (1 = positive, −1 = negative) predicted the probability judgments and brand attitudes, and the probability judgments predicted brand attitudes. Moreover, each of these paths was moderated by centrality. The effect of in-game experience and the interaction with centrality were weaker but still significant when controlling for the probability judgments (see Figure 5). Thus, there was a partial mediation in the central condition with a significant indirect and direct effect. In the peripheral condition, there was neither an indirect nor a direct effect (see Figure 5).

3.3 | Discussion

Study 1 provides the first evidence for our hypotheses: Brands encountered during positive in-game experiences were evaluated more positively than brands encountered during negative in-game experiences (H1). In line with H4, this effect was stronger when brands were central to the game. Players' pairing memory also depended on the centrality of the brands, supporting H3. In a mediation analysis, pairing memory partially mediated the effect of in-game experiences on brand attitudes, supporting H2. Thus altogether, the results support our theoretical reasoning.

Yet, we need to acknowledge that the methodology in Study 1 may not provide a robust estimate of pairing memory (Hütter et al., 2012). For instance, players might have used their brand attitudes as a heuristic for a brand's co-occurrence with serum rewards or explosions ("If I like this brand, it probably co-occurred with something positive"), thus perhaps overestimating pairing memory. This might have been facilitated further by asking for continuous probability judgments instead of binary recollection or recognition. As we also only find a partial mediation, the question arises if there is also evaluative conditioning in video games without pairing memory. Obviously, this is important not only for understanding the theory behind effects of in-game brand placements, but also for practical purposes because attention and pairing memory will be low in many gaming situations. Study 2 uses a more sensitive measure to further test the role of pairing memory. Namely, we adapt the well-established process-dissociation procedure of memory-dependent and memory-independent processes to evaluative conditioning (Hütter & Sweldens, 2013; Hütter et al., 2012; Jacoby, 1991).

4 | STUDY 2

Separating memory-dependent and memory-independent effects on brand attitudes is not trivial because both lead to the same outcome under normal conditions (Figure 6): If players recollect that a brand co-occurred with a positive in-game experience (represented by the probability *m*), they will indicate positive attitudes. If players do not recollect the pairing, but memory-independent evaluative conditioning occurred (represented by the probability *a*), they will also report positive attitudes. Last, even in the absence of any evaluative conditioning, they could report positive attitudes because of chance or response tendencies (probability *r*). Merely from the reported attitudes, one cannot distinguish between the three influences and cannot estimate their probabilities.

Therefore one needs to create conditions under which these processes lead to different outcomes. To do so, we apply the process-dissociation procedure (Hütter et al., 2012; Jacoby, 1991). This procedure is a well-established technique for isolating different cognitive processes (see Hütter & Klauer, 2016), which has also been used in consumer research (e.g., Hütter & Sweldens, 2018; Shapiro & Krishnan, 2001). The logic is as follows:

Participants in a so-called *inclusion condition* are instructed to report positive (negative) attitudes if they explicitly remember that a brand co-occurred with a positive (negative) in-game experience. If they have no explicit memory, they should answer according to their attitude towards the brand (positive if positive, negative if negative). Crucially, participants in an *exclusion condition* are told to reverse their responses in the latter cases. So, if they do not remember, they should answer "negative" in case of a positive attitude, and "positive" in case of a negative attitude towards the brand. Thus, remembering and not remembering lead to different outcomes in this exclusion condition. Thereby the probabilities of *m*, *a*, and *r* can be estimated

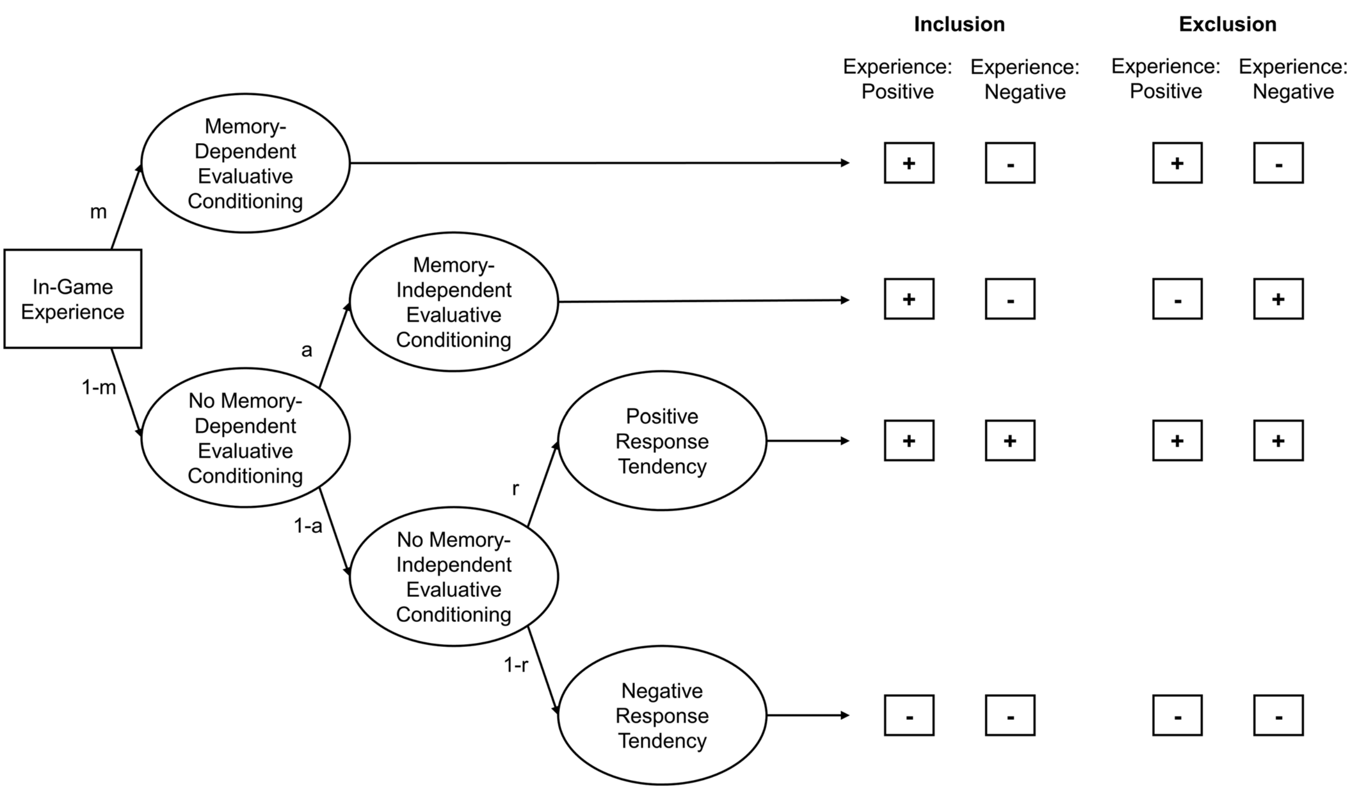


FIGURE 6 Illustration of the process-dissociation procedure in Study 2. "+" and "−" refer to "positive" and "negative" answers.

from the empirical data. The estimated probabilities indicate if there is memory-dependent evaluative conditioning (i.e., the probability m is larger than zero) and memory-independent evaluative conditioning (i.e., the probability a is larger than zero). Furthermore, these probabilities should also be sensitive to the brands' centrality to the game. If brands are central, memory-dependent effects (*m*) should be significantly higher than when brands are peripheral. Memory-independent effects (*a*) and response tendencies (*r*) should be unaffected by brand centrality.

In Study 2, we adapted this process-dissociation technique to the video game context to test the contribution of pairing memory. The rest of the procedure was similar to Study 1, thus providing robustness tests for Hypotheses 1–4.

4.1 | Methods

4.1.1 | Design

For Study 2, we used a 2 (centrality: central vs. peripheral) × 2 (Instruction: inclusion vs. exclusion) × 2 (in-game experience: positive vs. negative) mixed design with the first two factors manipulated between participants and the third factor manipulated within participants.

4.1.2 | Sample

For the process-dissociation procedure, we calculated an a priori analysis with the software multiTree (Moshagen, 2010). We used rough approximations of the latent probabilities based on previous evaluative conditioning research ($m_c = 0.3$, $m_p = 0.1$, $a_c = 0.2$, $a_c = 0.2$, $r_c = 0.5$, $r_p = 0.5$) and a comparison model where m_c and m_p are set equal (Hütter et al., 2012). This resulted in a minimum of 732 observations (~92 per factor level). As we had to change the stimulus distribution for the process-dissociation procedure (see next section), the necessary number of observations was reached with 61 participants in total. Due to uncertainty about the actual probabilities in our paradigm, we increased the intended sample size by 50%. We added a buffer of $N = 20$ in case participants had to be excluded. Thus, $N = 117$ participants (45.1% female; $M_{age} = 30.01$) were recruited from Prolific Academic and were paid £6.26/h.

4.1.3 | Procedure and materials

Study 2 used the same materials and procedure as Study 1, with the following exceptions: First, we improved the game's hardware requirements and made minor cosmetic changes to the user interface. Second, we translated all materials into English. Third, we used a different stimulus distribution. The process-dissociation procedure by Hütter et al. (2012) required deterministic outcomes (negative US = 100% explosions; positive 0% explosions). Also, we had to do without the unshown brands and increase the number of conditioned brands (see the previous section). Thus, we used 12 brands in Study 2, each presented in three rooms (where the container exclusively contained a serum or exploded).

After finishing the game, participants first worked on the process-dissociation procedure. We adapted the original instructions of Hütter et al. (2012) to our paradigm (see Supporting Information A). Participants should click on a “positive” button for each brand if they remembered that it co-occurred with a serum event and on a “negative” button if it co-occurred with an explosion. Participants in the inclusion condition should also click on the “positive” button if they did not remember the pairing but had a positive attitude towards the brand, and on the “negative” button in case of a negative attitude toward the brand. In the exclusion condition, participants should click on “positive” if they did not remember the pairing but had a negative attitude towards the brand (and vice versa). Note that this manipulation took place after the game. To ensure that participants understood the task, they had to pass six training trials with hypothetical scenarios to proceed to the actual task. We excluded 15 participants because they had failed the centrality attention check or had given obviously impossible/inaccurate answers on the task (e.g., answering “positive” for all brands). Thus, all results reported for Study 2 are based on $N = 102$. After the task, participants indicated their actual attitudes on the continuous rating scales of Study 1. The memory measures from Study 1 were not assessed; the rest of the procedure was identical.

4.2 | Results

4.2.1 | Manipulation check

As before, participants in the peripheral condition reported lower brand attention, $M_{central} = 5.58$, $M_{peripheral} = 4.26$, $F(1, 98) = 13.63$, $p < 0.001$. As in Study 1, all other terms (including the ANOVAs for game liking and affinity) were not significant, all $Fs < 2.86$, all $ps > 0.094$.

4.2.2 | Brand attitudes

The results are visualized in Figure 7. Consistent with H1 and Study 1, players evaluated brands encountered during positive in-game experiences more favorably than those encountered during negative experiences, $F(1, 98) = 57.98$, $p < 0.001$, $\eta^2_p = 0.372$. Moreover, consistent with H4 and the results from Study 1, this effect was moderated by centrality, $F(1, 98) = 22.48$, $p < 0.001$, $\eta^2_p = 0.187$, with stronger effects in the central condition (see Table 1). Irrelevant to our hypotheses, participants in the exclusion condition indicated less favorable brand attitudes, $F(1, 98) = 5.73$, $p = 0.019$, $\eta^2_p = 0.055$. All other terms were insignificant, all $Fs < 2.82$, all $ps > 0.096$.

FIGURE 7 Brand attitude by in-game experience, centrality, and instruction in Study 2. Error bars represent the standard error.

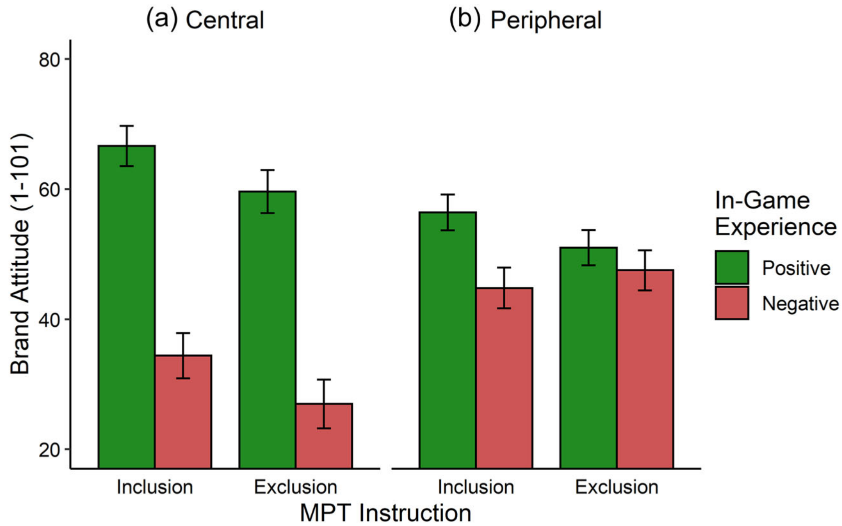
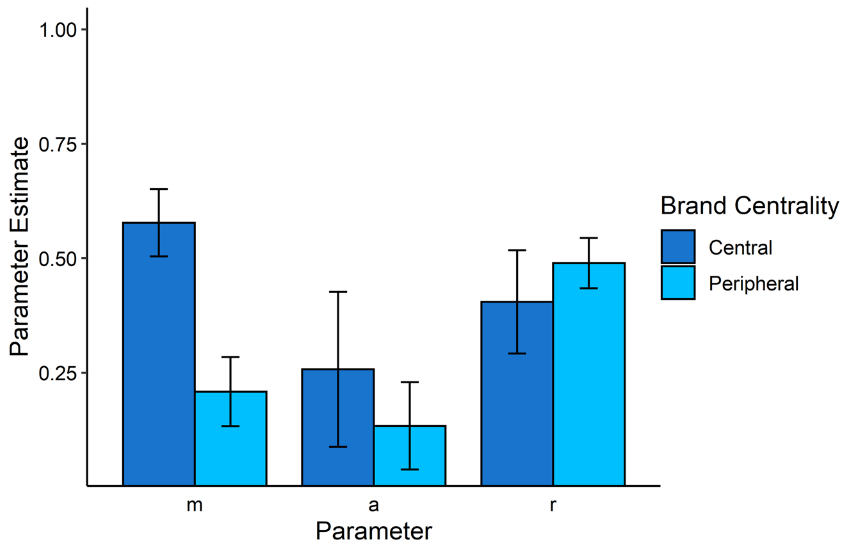


FIGURE 8 Parameter estimates from the process-dissociation procedure (Study 2). Error bars represent the 95% Confidence Interval. a, memory-independent evaluative conditioning; m, memory-dependent evaluative conditioning; r, response tendencies.



4.2.3 | Process-dissociation procedure

We analyzed the data with multiTree (Moshagen, 2010). The initial model containing individual parameters for each centrality condition fitted the empirical data well, $G^2(2) = 3.07$, $p = 0.215$. The results of this model are visualized in Figure 8.

As expected from H2, there was memory-dependent evaluative conditioning in both centrality conditions (see the *m*-parameter in Figure 8). However, consistent with H3, memory-dependent evaluative conditioning was stronger in the central than in the peripheral condition, $\Delta G^2(1) = 55.44$, $p < 0.001$, AIC difference = 55.44, BIC difference = 48.33. There was also memory-independent evaluative conditioning in both conditions (see the *a*-parameter in Figure 8). Memory-independent evaluative conditioning did not differ significantly between conditions, $\Delta G^2(1) = 1.15$, $p = 0.284$, AIC difference = −0.85, BIC difference = −5.96. The response tendency parameters did not indicate a preference for positive/negative response tendencies and did not differ significantly between the centrality conditions, $\Delta G^2(1) = 1.40$, $p = 0.237$, AIC difference = −0.60, BIC difference = −5.71. Thus, the centrality conditions only differed in the probability of memory-dependent, but not in memory-independent evaluative conditioning or response tendencies.[3]

4.3 | Discussion

In Study 2, we replicated all findings of Study 1: Brands encountered during positive experiences were evaluated more positively than those encountered during negative in-game experiences (H1). Again, and in line with H4, this effect was stronger when the brands were central to the gameplay. A process-dissociation procedure revealed memory-dependent (H2) but also memory-independent evaluative

[3]We also tested for the interaction of Centrality × Parameter with parametric order constraints (Kuhlmann et al., 2019). As expected, the interaction was significant, $\Delta G^2(2) = 17.29$, $p < 0.001$, AIC difference = 13.29, BIC difference = 3.07, meaning that centrality only affected memory-dependent effects.

conditioning effects. Thus, memory for the pairings accounts for most of the evaluative conditioning effect from video games to placed brands, but not all of it. As expected, memory-dependent but not memory-independent effects were stronger when brands were central to the gameplay (H3).

5 | GENERAL DISCUSSION

Placing brands in video games has become a widespread marketing technique; yet, current meta-analytic evidence shows only a small and heterogeneous overall effect on brand attitudes (van Berlo et al., 2021). Our research contributes to understanding the conditions that make brand placements successful by adapting the evaluative conditioning framework. In two experimental studies within the same 3D first-person game, brands encountered during positive in-game experiences were evaluated more positively than those encountered during negative in-game experiences and even unshown brands. Moreover, consistent with the literature on evaluative conditioning, memory for the pairings was a decisive factor for the effects, as shown in a mediation analysis (Study 1) and a process-dissociation procedure (Study 2). Consequentially, evaluative conditioning effects were stronger when memory for the pairings was increased by making the brands central to the gameplay.

Our results have several novel implications and not only advance our understanding of the processes underlying the effects of brand placements in video games on brand attitudes but also bear important practical implications.

5.1 | Theoretical implications for brand placements

Previous research on brand placements in video games assumed that the pleasant experience that emerges from playing the game positively influences attitudes towards placed brands. However, evaluative conditioning as a conceptual framework and the findings from our studies suggest that brand attitudes depend on the specific momentary experience at the time when the brand is encountered. As the affective experiences vary tremendously and rapidly throughout a game (e.g., Bender & Sung, 2021; Ravaja et al., 2006), the success of a brand placement will also vary tremendously depending on which exact experience was present at the time of brand exposure.

Such evaluative conditioning effects that vary with the specific in-game experiences may be responsible for the overall weak and empirically inconsistent effect of brand placements in video games on brand attitudes (van Berlo et al., 2021): In some studies, brands might have occurred predominantly with positive in-game experiences, in others with negative in-game experiences, thus leading to heterogeneous effects of in-game brand placements on brand attitudes. In line with this reasoning, Waiguny et al. (2013) found that brand attitudes tend to become less favorable with violent game content (e.g., blood effects) but more favorable with nonviolent games. In a violent game, negative in-game experiences might be more frequent, thus making it more likely that the placement occurred in a negative context.

Note that our findings do not imply that overall game enjoyment has no impact on brand attitudes. In fact, we also find a small correlation between game liking and brand attitudes similar to the meta-analytic effect of $r_c = 0.11$ (van Berlo et al., 2021), $r = 0.16$, $p = 0.037$, suggesting that both overall enjoyment and specific in-game experiences contribute to brand liking. Yet, the evaluative conditioning effects in our study were much stronger. Thus, evaluative conditioning effects might often overshadow the impact of overall game enjoyment, especially when the conditions for memory-dependent conditioning are met.

Beyond merely emphasizing the role of momentary specific in-game experiences in brand attitude change, evaluative conditioning as a conceptual framework also predicts specific cognitive mediators and, thus, specific moderating conditions of brand placement effectiveness. Based on stimulus-stimulus learning theories on evaluative conditioning (e.g., Gast, 2018; Hofmann et al., 2010; Hütter et al., 2012; Sweldens et al., 2010), we predicted that explicit memory of the pairings of brands and in-game experiences benefits evaluative conditioning effects on brand attitudes. Both Experiment 1 with a mediation analysis and Experiment 2 with a process-dissociation procedure show that pairing memory substantially accounts for evaluative conditioning effects in video games. Furthermore, making the brands a central part of the gameplay increases pairing memory and thus also evaluative conditioning effects, as shown by our experiments.

However, we also found in both studies that pairing memory does not fully account for the evaluative conditioning effects. This implies that additional processes beyond explicit memory retrieval are at work. For instance, players might still form a memory link between a brand and an in-game experience, but this memory link is implicit and not consciously accessible (Gawronski & Bodenhausen, 2014; but see Sweldens et al., 2014). A second possibility is that players might also sometimes misattribute the positive/negative affect from an in-game experience on a brand and form a direct association of a brand with the affect (March et al., 2019; Sweldens et al., 2010). Although it is currently unclear whether affect misattribution is involved in evaluative conditioning at all, video games arguably provide optimal conditions for misattribution due to the fast-changing visual input with multiple stimuli (Hütter & Sweldens, 2013; Sweldens et al., 2010).

5.2 | Managerial implications

This research shows that brands may not necessarily benefit from placements in video games. In Experiment 1, only brands encountered during positive in-game experiences were rated more favorably than new ones. Brands encountered during negative in-game experiences were evaluated more negatively than unshown brands, at least descriptively. Thus, a straightforward implication is that marketers have to take great care where to place the brand in the game. Depending on the game, it might be possible to present brands with positive experiences only, as in the example of Death Stranding, where the presence of Monster Energy is inherently positive. In other games, such as the racing game Burnout Paradise, marketers have less control over the affective experiences when the specific brand is encountered, and thus brand placement effectiveness cannot be guaranteed.

A second implication for in-game placements concerns brand centrality. Our findings suggest that a brand-central strategy strengthens the positive effects of a positive in-game experience on brand attitudes. This could be achieved by designing a story around the brands, as demonstrated in our experiments. In this respect, advergames (where the game's sole purpose is to endorse the brand) have a clear advantage and bear greater potential for evaluative conditioning effects (Martí-Parreño et al., 2013). Of course, marketers need to ensure that brand centrality does not disrupt the gameplay but is consistent with the game content. Otherwise, brand placements could be perceived as manipulative or nonfitting to a particular game and induce reactance (Van Reijmersdal, 2009).

Third, our studies also show small evaluative conditioning effects in the absence of memory. Even though these effects tend to be small, they raise important questions regarding the ethics of in-game brand placements. If brand placements can affect attitudes without memory, gamers might not be able to correct for the placement influence (see also Sweldens et al., 2010). This becomes an even more critical issue considering that video games are played by billions of minors, a vulnerable consumer group (Friestad & Wright, 1994; Waiguny et al., 2012).

5.3 | Limitations and directions for future research

In this research, we straightforwardly operationalized positive/negative in-game experiences by events that contribute positively/negatively to the game's overall goal—collecting the serum. However, such momentary progress/setback is certainly not the only source of affect in video games (e.g., Cheah et al., 2022; Wang & Hang, 2021). Also, people will differ in the affect elicited by the experience (e.g., Ingendahl & Vogel, 2022), and some appraisals could be rather complex (Bartsch et al., 2008). For instance, in a horror game, players may expect fear and deliberately choose the game for the thrill. If so, experiencing fright and anxiety might lead to a positive evaluation of brands (Bender & Sung, 2021).

This also brings us to the exact underlying processes of evaluative conditioning that may be operating here. Evaluative conditioning theories differ in whether they assume stimulus-response or stimulus-stimulus learning between brands and affective experiences (Sweldens et al., 2010; Vogel & Wänke, 2016). Our results on pairing memory suggest stimulus-stimulus connections between brands and in-game experiences. As the next step, the exact nature of these connections (i.e., associative/propositional) might be investigated, which could reveal exciting boundary conditions for brand placement effects in video games. Specifically, propositional processes could even reverse evaluative conditioning effects if players believe a brand *opposes* a specific affective experience (Gawronski & Bodenhausen, 2014). For example, if a medical brand cures diseases within a video game, brand attitudes would become more favorable, even though the brand co-occurs with the negative disease.

In our research, we argued that brand centrality fosters the memory for a brand and its co-occurring in-game experience. Beyond a mere memory advantage, however, games with high brand centrality might additionally build on brand-specific associations (e.g., Monster Energy—Stamina; cf. Broniarczyk & Alba, 1994). This might lead to further effects beyond mere evaluation, like players inferring specific attributes about a brand. Thus, future research should consider such brand-specific associations as well.

Last, our game Marslab 3D provided an internally valid test for our hypotheses. However, the gameplay options were more restricted, and the playtime was shorter than in other video games. Thus, one should also consider the long-term effects of video games and their influence on brand attitudes. Whereas our game usually takes around 20 min, other games are played for more than 100 h. Thus, a brand might not be encountered only three/eight but rather eight hundred times with a specific experience. Additionally, pairing memory could improve by more distributed exposure to the brands (e.g., Richter & Gast, 2017). Thus, evaluative conditioning effects in field settings might even be stronger than in our experiments.

6 | CONCLUSION

Contrary to marketers' hopes, brand placement in video games does not guarantee success. It is crucial that the brand is encountered during positive experiences in the game and not in situations when negative affect prevails. Not only does this finding offer a potential explanation for why previous research found mixed results, it also provides a guideline on how to place brands more effectively. The second piece of advice from our research is to create conditions so that the pairing of the brand with the positively experienced scene is remembered. Our results showcase the value of fundamental research, in this case, the principles of evaluative conditioning effects for applied advertising contexts.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in OSF at https://doi.org/10.17605/OSF.IO/QKHTS.

ORCID

Moritz Ingendahl https://orcid.org/0000-0002-2124-0754

Tobias Vogel https://orcid.org/0000-0002-5768-1391

Alexander Maedche https://orcid.org/0000-0001-6546-4816

Michaela Wänke https://orcid.org/0000-0001-8546-4936

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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