

Gamified Ads: Bridging the Gap Between User Enjoyment and the Effectiveness of Online Ads

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Figure 1: Deactivate ads by clicking a “close” button or by playing a Paintball (b), Tetris (c) or Monster (d) game.

ABSTRACT

While the use of ad blockers prevents negative impacts of advertising on user experience, it poses a serious threat to the business model of commercial web services and freely available content on the web. As an alternative, we investigate the user enjoyment and the advertising effectiveness of playfully deactivating online ads. We created eight game concepts, performed a pre-study assessing the users’ perception of them (N=50) and implemented three well-perceived ones. In a lab study (N=72), we found that these game concepts are more enjoyable than deactivating ads without game elements. Additionally, one game concept was even preferred over using an ad blocker. Notably, playfully deactivating ads was shown to have a positive impact on users’ brand and product memory, enhancing the advertising effectiveness. Thus, our results indicate that playfully deactivating ads is a promising way of bridging the gap between user enjoyment and effective advertising.

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CCS CONCEPTS

• Human-centered computing → Empirical studies in HCI;

KEYWORDS

Advertising; recall; recognition; effectiveness; enjoyment

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1 INTRODUCTION

When using websites, web services or smartphone applications, advertising has become ubiquitous for users [29]. In fact, there is a good reason for that, as most popular websites such as search engines, streaming services or news platforms are primarily monetized through online advertisements (“ads”) [29, 34]. This allows them to offer many of these services free of charge. The history of this business model dates back to the year 1994, in which one of the first clickable banner ads appeared on the web magazine HotWired.com [12, 20]. At that time, 44% of those users who saw the ad, clicked on it [20]. Encouraged by this success, online advertising has grown dramatically [29]. Various formats (e.g. banners, pop-ups, skyscrapers) or methods (e.g. online behavioral advertisement tracking users across sites) evolved,

striving to maximize revenue and competing for the user's attention [12, 20, 34]. This process led to online advertisements becoming more complex over the years, involving an increased amount of sensitive user-specific data for the purpose of optimal ad placements [49].

However, these developments did not come without cost. Negative trends emerged such as "banner blindness", meaning that users got used to banner ads, leading to a dramatic decrease of ad effectiveness [14]. Even worse, users perceive ads to be more and more annoying (e.g. because of ad clutter) [12], intrusive (e.g. caused by ads that require explicit interaction) [34] and disruptive (e.g. because of animated content or autoplaying videos that cannot be deactivated) [1], leading to a negative user experience [7, 36]. As a result, users react with site abandonment [14] or make use of so called "ad blockers", preventing ads from loading on websites [1]. However, both presents a serious threat to the business model of commercial web services [34]. Advertising companies estimate that by 2020, \$35 billion dollars per year will be lost as a result of ad avoidance [1]. Therefore, many web services started to put pressure on users of ad blocking software by preventing them from accessing the content of the service [1]. Ultimately, this cyclic process affects both web service providers and users negatively, as it leads to considerable revenue losses, less freely available content on the Web and a diminished user experience [1].

To counter this, we investigate whether gamification, the use of game elements in non-game contexts [16], can be used to allow users to playfully deactivate ads and thereby provide a way to enhance the experience of users. At the same time, we explore whether gamification may also have positive effects on the effectiveness of online ads, as it encourages a playful interaction with the ad, which may lead to an increased product and/or brand memory. We developed eight different concepts to playfully deactivate ads and created storyboards, illustrating each of these concepts. After performing a study ensuring that these storyboards actually explain the intended game concepts (N=20), we conducted a pre-study to assess the perception of each concept (N=50). Based on the results, three well-perceived concepts were realized. To investigate the effects on user enjoyment and ad effectiveness for each realized game concept, we implemented a news website in which each one was integrated. In a lab experiment (N=72), we found that participants enjoyed playfully deactivating ads. Additionally, one game concept was even preferred over using an ad blocker. Notably, our results show that playfully deactivating ads leads to higher measures of explicit brand and product memory and thus enhances the effectiveness of ads. Lastly, positive effects on the attitude towards the website hosting the ad and partially negative effects on the

perception of the site content were found.

Our contribution is manifold: First, we contribute a set of game concepts to playfully deactivate ads, illustrated by storyboards that were shown to be comprehensible. Second, we provide quantitative and qualitative insights about the perception of each game concept, highlight well- and poorly perceived ones and establish requirements for our approach. Third, we use these insights to implement three well-perceived game concepts that were integrated into a news platform. Last, we contribute findings about the perception of playfully deactivating ads, about its effects on implicit (e.g. unconscious brand recollection) and explicit (e.g. intentional brand recollection) memory measures and on attitudes towards the website, ads, and the news articles. Our results indicate that playfully deactivating ads is a promising way of bridging the gap between effective advertising and user enjoyment. To our knowledge, this paper contributes the first investigation of such an approach.

2 RELATED WORK

Related work shows that user experience and enjoyment have become determinant factors influencing the success of online ads [36, 45] and that user control over ads is beneficial for these factors [29]. Moreover, interactivity has been shown to positively influence ad remembrance [24], attitudes towards ads and advertised products or brands [9, 42] and stimulates user engagement [42]. Also, placing ads in games has been perceived well [30] and has been shown to have positive effects on the brand and product memory of players [30, 48]. These findings motivate our approach as we strive for engaging users by providing an enjoying way of deactivating ads, involving interactivity and elements known from games. The following sections present relevant works from all the aforementioned areas.

Online Advertising and User Experience

Factors influencing the user experience of ads are considered as a substantial dimension of ad performance [36]. For instance, Rohrer and Boyd [36] found that deceptive ads have a negative effect on user experience, while intrusive ads are more annoying, but at the same time positively affect perceived entertainment. Following on that, Kim et al. [22] investigated whether perceived entertainment has an effect on customers' buying intentions. The authors were able to show that perceived entertainment indeed affects trust towards websites and thus buying intentions positively. This supports our idea of augmenting ads with elements known from games, as it may enhance enjoyment and user experience. The fact that entertainment and enjoyment have been identified to be key factors that positively influence the effectiveness of mobile advertising is also highlighted by Visuri et al. [45]. They propose a new non-disruptive ad type, which

can be easily removed. The authors found that besides having positive effects on ad effectiveness, substantial benefits for the user experience were identified, since the proposed ad type allowed users to control where the ad is placed on the screen and when to deactivate it. In addition, to mitigate the negative effects of online ads, so-called ad blockers are increasingly used, as described by Miroglia et al. [29]. In their work, the authors investigate the effects of ad blocking on user engagement with the web. They found that users that have an ad blocker installed visit more pages than users without ad blockers, suggesting that using an ad blocker seems to be beneficial to the users' engagement with the web. Considering these findings, it seems worthwhile investigating whether giving users the option to playfully deactivate ads might lead to similar positive effects on enjoyment.

Interactive Advertising

Interactivity creates involving experiences, as explained by Liu and Shrum [24]. The authors found that interactive online ads positively relate to user learning and user satisfaction. As a result, positive effects on the recognition and recall of messages are likely, and feelings of perceived control were shown to be beneficial for the user experience. These results support our idea of using game elements, requiring a playful interaction with ads, to support both user enjoyment and the effectiveness of ads through increased remembrance. Similarly, Risdien et al. [35] compared brand awareness between television advertisements and interactive web advertisement and found that participants were more likely to mention a product that was advertised interactively than a product shown on TV, supporting the positive effects of interactivity. Subsequently, Campbell and Wright [9] analyzed the interplay between interactivity of online ads and the attitude towards the ad, the product and the website hosting the ad. The results show that the perceived level of interactivity positively affected users' attitudes towards the ads and their featured products, as well as the host site. This indicates that interaction might not only lead to positive effects for the ad or the advertised product, but also for the website hosting such interactive ads. Based on these results, we expect to find similar effects due to the playful interaction with the ad in our setting. Related to this, Sundar and Kim [42] emphasize that interactivity promotes user engagement with content, which is expected to lead to positive attitudes towards the ad and the product. They show that interactivity is a strong cue influencing these attributes positively. They also found that animation leads to similar effects, but negatively affects product involvement, i.e. participants had problems recalling product information with animated ads, which might be attributable to the distractive potential of animated ads. This lesson was relevant for our game concepts, insofar as we aimed to reduce excessive, distractive animations.

Gameful Advertising

Combining games and advertising builds on the expectation to transfer the positive feelings and emotions induced by games to the advertised product or brand [5]. Also, the interactivity of digital games is expected to interfere with players' memory [48]. Often, so-called "In-Game Advertising" (IGA) is investigated, which means that brands or products are being integrated into digital games [43]. Nelson [30], for instance, found that most players do not consider the practice of brand placements as deceptive and that players recalled 25% to 30% of brands immediately after playing the game. Similarly, Yang et al. [48] found that in-game ads in video games influence both explicit and implicit memory (a word fragment test was used) positively. Positive effects on consumers' attitude towards IGAs and memory were also shown by Ho et al. [40]. In addition, the authors show that subtle product placements lead to a lower level of explicit but a higher level of implicit memory. Overall, these investigations demonstrate that integrating ads or brands into digital games leads to positive effects on the attitude towards brands and on the effectiveness of ads. This supports our approach of augmenting ads with game elements, even though it is unclear whether augmenting ads with game elements, instead of integrating ads into games, leads to similar positive effects. Gameful approaches have also been used for marketing campaigns. One prominent example is the alternate reality game "I love Bees" with more than one million players [23]. It was launched in 2004 to promote the release of the Xbox game "Halo 2". In an official trailer of the game, a website was advertised which revealed that players had to collaborate, combining virtual gameplay with events in the real world, to help an artificial intelligence that was stranded on Earth find its way back to the Halo world. Similarly, "The Beast", another alternate reality game launched in 2001 to promote the Steven Spielberg movie "Artificial Intelligence", attracted over three million players worldwide [23]. These examples illustrate that using games for advertising purposes has the power to engage many users and spark interest in the advertised product or service. "Gamified" advertising for sports products was explored by Bittner and Shipper [5]. Here, it needs to be considered that the authors used the term "gamified products" for banner ads in which the product slogans suggested playful features of the product, i.e. the ads did not have any interactive quality. The authors found that gamified products may positively support intrinsic motivation, which in turn leads to an increased enjoyment of the advertised product. Building on that, we expect an increased enjoyment that comes from playfully deactivating ads. We moreover anticipate that this not only affects the process of deactivating ads, but also has positive effects on the perception of the ad and the website.

3 GAME CONCEPTS AND STORYBOARDS

Since we provide the first investigation of playfully deactivating ads (as far as we know), we created eight different game concepts based on simple and well-known games [6, 19]; these will be described in the following sections. For each game concept a storyboard was created, based on the guidelines by Truong et al. [44]. The storyboards were used to evaluate the perception of each game concept in order to elicit well perceived concepts for later implementation. All figures show the final versions of the storyboards, i.e. all changes that were derived through the validation study described later in Section 3 are already integrated.

Paintball

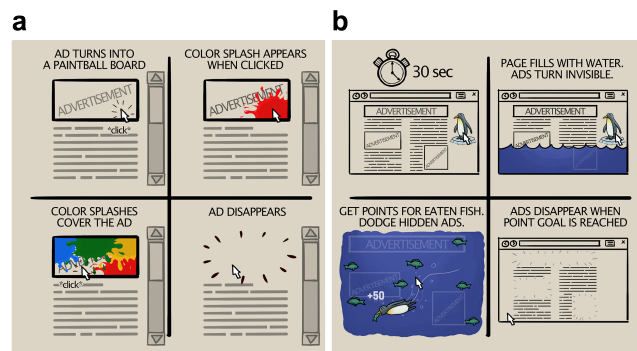


Figure 2: Final versions of the storyboards illustrating the Paintball (a) and the Underwater (b) concepts

In this game concept (see Figure 2a), ads can be shot at with a virtual paintball gun, covering parts of them with color splashes. Once the advertisement is completely covered, it disappears and will not be displayed again.

Underwater Website

When clicked, the user has 30 seconds to memorize the layout of the web page. Afterwards, the web page begins to fill with water and all ads turn invisible. Once fully filled, the user can control a penguin through the water by dragging the mouse and catch fish. Hereby, the penguin has to evade the invisible advertisements. Catching fish gives points. Once a point goal is reached, all ads disappear (see Figure 2b).

Rival Teams Competing Over Website Control

Two rival teams compete over control of ads on web pages. Users can capture ads, which causes them to disappear and not be displayed again. The user's team gets rewarded points for the claimed ad. The number of claims is visualized and shows which team is winning (see Figure 3a).

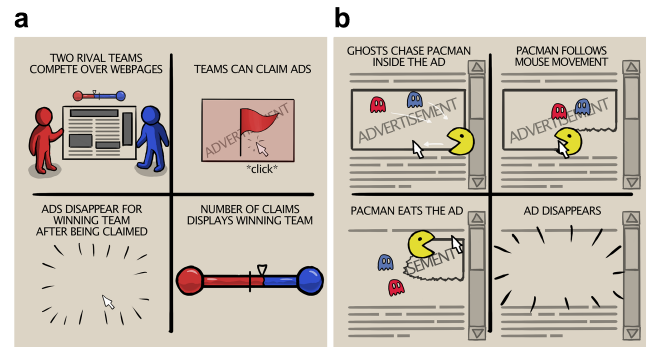


Figure 3: Final versions of the storyboards illustrating the Rival Teams (a) and Pacman (b) concepts

Pacman

In this concept, ads can be turned into a Pacman game (see Figure 3b). The Pacman character follows the mouse and needs to evade the chasing ghosts. By moving, the Pacman character bites off parts of the ad. Once the ad is small enough, it disappears and will not be displayed again.

Tetris

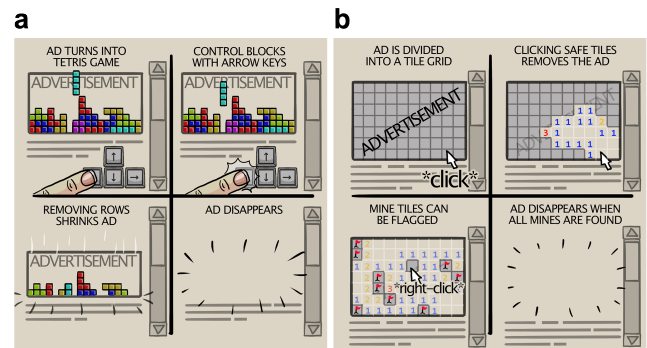


Figure 4: Final versions of the storyboards illustrating the Tetris (a) and Minesweeper (b) concepts

The ad can be turned into a Tetris game (see Figure 4a). Falling blocks can be moved with the arrow keys on the keyboard. The ad shrinks every time a row is removed. Once the advertisement is small enough, it disappears and will not be displayed again.

Minesweeper

The ad can be turned into a Minesweeper game (see Figure 4b). When tiles are clicked, they give hint on the amount of mines in their proximity. The mine tiles can be flagged by right clicking. Once every mine is found, the ad disappears and will not be displayed again.

Collecting Coins

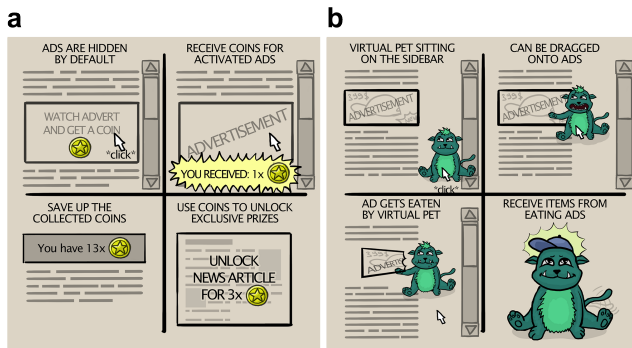


Figure 5: Final versions of the storyboards illustrating the Coins (a) and Monster (b) concepts

Ads are hidden by default and can be manually clicked to display the hidden ad, granting virtual coins to the user. These coins can be used to unlock exclusive content or other prizes on the web page (see Figure 5a).

Ad-Eating Monster

On the sidebar of the web page a virtual character is displayed. It can be clicked and dragged onto ads. The virtual character then eats the ad and receives a virtual item that can be worn or equipped by the virtual character. The ad disappears and will not be displayed again (see Figure 5b).

Storyboard Validation

We set up an online questionnaire, in which the storyboards were shown to participants in random order to ensure that they are comprehensible. Participants were given the following task: *“In your own words, please describe the game idea that is illustrated in this storyboard”*. Answers could be provided in a free-text field. Afterwards, two independent raters read through all answers and rated whether participants understood the underlying game idea, using a scale of 1= *“the participant did not understand the concept at all”*, 2= *“there were minor comprehension issues”* and 3= *“the participant fully understood the concept”*. Moreover, each rater was asked to note aspects that were misunderstood.

We recruited 20 American participants (15 male) from Amazon Mechanical Turk (“AMT”), who were paid \$1.50 each (the study took roughly 10-15 minutes to complete). To ensure that the ratings could be interpreted objectively, we calculated the inter-rater agreement and found it to be Cohen’s Kappa $\kappa=0.94$, which is considered almost perfect [27]. The average rating across all storyboards was 2.78 (SD = 0.16, Mdn = 3), showing that there were no major comprehension issues. This is supported by the fact that all storyboards were

given a median rating of 3 by the raters and that their mean rating was higher than 2.50. Therefore, based on the transcribed comprehension issues, only minor adaptations had to be made: We used the term “token”, on the “Collecting Coins” storyboard, which led to false interpretations. Therefore, it was renamed to “coins” instead. Also, some participants did not realize that the ad was embedded in a web page, which is why scroll bars on the right side of each screen were added, indicating the use of a web browser.

4 GAME CONCEPTS EVALUATION AND IMPLEMENTATION

To inform which game concepts should be implemented and to get further insights about important requirements for later realization, we performed a study assessing the perception of each game concept. For this study, the final versions of the storyboards, i.e. those after the validation study, were used.

Method

After asking about demographic data, and whether participants have an ad blocker installed, participants were asked to develop a game idea, which has the goal to improve their perception of ads on a website. This was done to elicit requirements that should be considered when implementing well-perceived game concepts. To get unbiased concepts, storyboards were presented in random order afterwards and the following perception statements had to be rated (on 5-point Likert scales) for each concept:

EnhancePerception: *“This game idea would enhance my perception of ads on a website”*

LikePlay: *“I would like to play this game to deactivate ads”*

FunPlay: *“This game would be fun to play”*

LikeIdea: *“I like this game idea”*

Furthermore, a comprehension question was asked for each storyboard, to be answered on a 5-point Likert scale (*“I think this game idea is easy to understand”*). American participants were recruited from AMT and paid \$2.50 for participating (the study took roughly 15-20 minutes to complete).

Results

50 participants took part (31 male), of which 66% had an ad blocker installed. The written answers were analyzed by conducting an inductive content analysis [21] with two coders. Results were discussed and deviations solved to establish a final set of themes. Based on this, we derived the following requirements for the realization of the game concepts:

R1: Casual games: Most game concepts (35) were using simple rules.

R2: Entertainment over effectiveness: 20 participants emphasized that the main purpose should be entertainment and not promotion of a product/brand.

R3: Unobtrusiveness: 16 participants required that no ad-specific events (e.g. redirecting to another website) should be triggered; the ad and the game should be separated regarding user interaction (e.g. by using a start button).

R4: Short play time: The games should not take long to complete (mentioned by 13 participants). Five participants even reported concrete time spans (15 to 60 seconds).

Table 1: Mean (“M”), standard deviation (“SD”) and median (“Mdn”) for each concept. Significant differences ($p < .05$) from the neutral choice are color-coded (green for positive deviations, red for negative ones).

	EnhanceP.	LikePlay	FunPlay	LikeIdea
Paintball	M = 3.32 SD = 1.42 Mdn = 4.00	M = 3.24 SD = 1.45 Mdn = 4.00	M = 3.36 SD = 1.43 Mdn = 4.00	M = 3.56 SD = 1.37 Mdn = 4.00
Underwater	M = 3.24 SD = 1.36 Mdn = 3.50	M = 3.04 SD = 1.43 Mdn = 3.00	M = 2.94 SD = 1.42 Mdn = 3.00	M = 3.12 SD = 1.61 Mdn = 3.00
Rival Teams	M = 2.64 SD = 1.24 Mdn = 3.00	M = 2.38 SD = 1.14 Mdn = 2.00	M = 2.54 SD = 1.39 Mdn = 2.00	M = 2.62 SD = 1.23 Mdn = 3.00
Pacman	M = 3.04 SD = 1.43 Mdn = 4.00	M = 3.06 SD = 1.45 Mdn = 3.00	M = 3.22 SD = 1.43 Mdn = 4.00	M = 3.28 SD = 1.37 Mdn = 4.00
Tetris	M = 3.72 SD = 1.26 Mdn = 4.00	M = 3.76 SD = 1.38 Mdn = 4.00	M = 3.96 SD = 1.21 Mdn = 4.00	M = 3.86 SD = 1.18 Mdn = 4.00
Minesweeper	M = 3.74 SD = 1.21 Mdn = 4.00	M = 3.66 SD = 1.33 Mdn = 4.00	M = 3.82 SD = 1.34 Mdn = 4.00	M = 3.88 SD = 1.27 Mdn = 4.00
Collecting Coins	M = 2.92 SD = 1.31 Mdn = 3.00	M = 2.96 SD = 1.38 Mdn = 3.00	M = 3.28 SD = 1.42 Mdn = 4.00	M = 3.14 SD = 1.40 Mdn = 4.00
Monster	M = 3.24 SD = 1.38 Mdn = 4.00	M = 3.28 SD = 1.43 Mdn = 3.50	M = 3.36 SD = 1.34 Mdn = 4.00	M = 3.52 SD = 1.31 Mdn = 4.00

The game concepts were easy to understand ($M = 4.21$, $SD = 0.35$, $Mdn = 4.5$), backing up the findings from the validation study. We performed one-sample t-tests against the value 3 (“neither agree or disagree”) for all perception statements, to see which game concepts were perceived significantly better than the neutral choice. Based on the results (see Table 1), four game concepts showed positive effects: “Paintball”, “Tetris”, “Minesweeper” and “Monster”. Since it is hard to reduce the playing time of the “Minesweeper” concept substantially (**R4**) because of the inherent strategic nature of the game, the Paintball, Tetris and Monster concepts were implemented. These three concepts differ in their level of interactivity (while “Tetris” requires the most interaction to deactivate an ad, “Paintball” requires less and the “Monster” the least interaction).

Implementation of the Game Concepts

The selected concepts were implemented within a fictitious news website. In line with previous advertising research [8,

14, 15, 47], we decided to use a news website, since they are relying on financial revenue from ads [1, 47], provide the opportunity for goal-oriented tasks [15], and because reading news articles is considered a typical activity users perform on the web [1, 7, 9], thus embodying a realistic setting. Since there are only a few simple rules to be considered to play each of the three game concepts, we see **R1** as fulfilled. Also, since we aimed for game concepts that are independent of the actual ad, there was no connection between ad content and the game (**R2**). Regarding **R3**, we implemented two buttons placed on the top left corner of an ad, to get information about how to play the game and how to start the game. Once the button to start the game is pressed, the interactivity of the actual ad (redirecting the user to the website of the brand) is deactivated. Considering **R4**, we adapted the game goals such that winning is possible within a short duration (all games can be completed in less than 30 seconds). In the following, each implementation is described in more detail.

Paintball. Once users start the game, they can shoot color splashes on the ad by clicking on it (see Figure 1b). The ammunition is limited and the capacity of the magazine holds five shots, i.e. the gun needs to be reloaded by pressing the space key. Once enough of the ad space is covered, the game is won, a congratulatory message appears and the ad finally fades out. To account for **R4**, color splashes adapt to the ad size. If the game is lost, i.e. there is no ammunition left, the user is shown the ad without the game tools. However, the game can be started again at any time.

Tetris. The ad is overlaid with a semi-transparent playing field (see Figure 1c). A random sequence of geometric pieces falls down, which can be rotated and moved. By pressing the down key, pieces fall down faster. The goal of the game is to place the pieces such that they create a horizontal line. When such a line is created, the game is won, a congratulatory message appears and the ad steadily shrinks until it is gone. To account for **R4**, we required users to only complete one row. If blocks touch the upper edge of the playing field, the game stops and can be re-started again.

Monster. In contrast to before, there is no dedicated “Start” button, since the monster is always visible on the left side of the screen. However, to account for **R3**, the monster needs to be dragged onto an ad. We implemented an idle animation, in which the monster waits at the left side of the screen, slowly moving its head and eyes. When the user starts dragging the monster, it starts to smile. Once the monster is dragged over an ad, it sticks out its tongue (see Figure 1d). When released, an eating animation starts, showing the monster chewing while the ad progressively disappears. Afterwards, the ad turns into a virtual item (e.g. a cap or sunglasses), that can be placed on the monster.

5 EVALUATION

We conducted a lab experiment, which was approved by our ethical review board¹, to investigate if playfully deactivating ads has an effect on ad effectiveness or user enjoyment. We compared every gamified condition against the baseline (deactivating ads without gamification) and expected the following effects:

- H1** Playfully deactivating ads is more enjoyable
- H2** A lower number of participants prefers using an ad blocker for reading a news article in the gamified conditions
- H3** Brand recall is higher in the gamified conditions
- H4** Product recall is higher in the gamified conditions
- H5** Brand recognition is higher in the gamified conditions
- H6** Product recognition is higher in the gamified conditions
- H7** Ad recognition is higher in the gamified conditions
- H8** Implicit brand memory is higher in gamified conditions
- H9** Gamification enhances the perception of the website
- H10** Gamification decreases the perception of news articles
- H11** Gamification enhances the perception of ads

We assume that the positive aspects of playful deactivation predominate over the higher effort needed, based on the inherent motivational power of games [38], affecting user motivation and thus enjoyment positively (**H1**, **H2**) [37]. **H3** - **H7** are motivated by previous research showing that interaction with ads leads to positive effects on explicit memory [24, 35]. As all of our implemented game concepts require directly interacting with the ad, we expect to find similar results. Since embedding ads in digital games was found to be beneficial for implicit (brand) memory [40, 48], we expect that the playful approach augmenting ads with game elements should also lead to positive effects, motivating **H8**. Because online advertising was found to influence the perception of both the website hosting the ad [9, 26, 31] as well as of news articles [47] previously, we were curious whether using gamified ads also leads to effects on these aspects (**H9**, **H10**). While we expect positive effects of the attitude towards the site, we expect that game elements should have a negative effect on the perception of news articles. Since interactive ads and slogans indicating playful features of an advertised product were found to affect the attitude towards the ad positively [5, 9, 42], we expect similar effects (**H11**).

Method

The main task of the experiment was to visit a news website (see video in the supplementary materials), read three different articles, answer a comprehension question for each article and deactivate an ad that was placed in each one. Participants were recruited via flyers on campus, social media and mailing lists. The study took approximately 35 minutes to

complete, was available in English and German, and was compensated with a € 7 Amazon voucher. Following a between-subjects design, participants were randomly assigned to one of four conditions (Baseline, Paintball, Tetris, Monster). In the Baseline condition, they could deactivate ads by clicking on a button (labeled with an “X” mark) on the upper right corner of the ad (similar to [3]; see Figure 1a). By requiring participants to close the ad in the baseline condition, we ensured that they interacted with the ad, which was necessary for the comparability of the conditions (i.e. without requiring participants to deactivate an ad, we could not ensure that the ad was recognized at all). Also, since interactive ads were shown to have positive effects on ad effectiveness [24, 35], using an interactive baseline is necessary to investigate the effects of gamified ads.

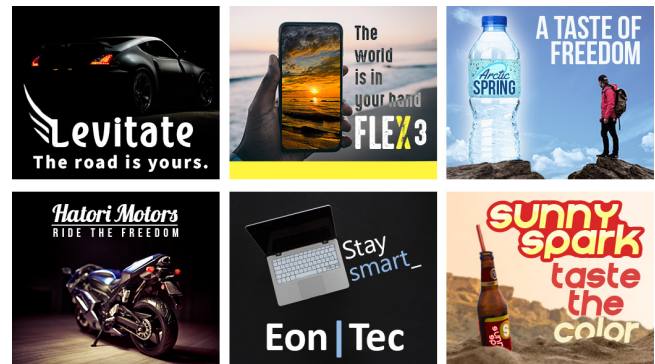


Figure 6: Banner ads of fictitious brands used in the study. All ads in the upper row were shown on the news web page; ads in the lower row were added in the questionnaire as false counterparts that were never shown on the news web page

Advertisements. We created six different ads, promoting fictitious brands and products, since advertising effects can be better assessed if participants have no preexisting attitudes towards the brands [3, 10]. Of these six, three were chosen to be shown in each of the three articles on the news website whereas the other three ads were added in the recognition tests as “false choices”, such that each included ad had a similar product as a false counterpart. Based on related work, we included an ad for mineral water with a soft drink as a counterpart (based on [35, 42]), an ad for a car having a motorcycle as a counterpart (based on [10, 15, 25]) and an ad for a mobile phone and one promoting a notebook as its counterpart (based on [17, 28]). All ads (see Figure 6) were created as banner ads (since this type of ad is the most frequently used [22]), in Google Ad Words’ 336x286 format² and placed approximately 2/3 of the way down the page, following recommendations from an ad placement study [2].

¹<https://erb.cs.uni-saarland.de/>, last accessed January 14, 2019
2019-01-14 14:32. Page 7 of 1–12.

²<https://bit.ly/2NPN00O>, last accessed January 14, 2019

Measures and Procedure. The experiment started with the instructor explaining the task to the participant. Next, participants signed a consent form, took a seat in front of a desktop PC and started filling out a web questionnaire guiding participants through the whole study. It should be noted that participants were not informed that they would be asked to recall brands or products, nor were they told to pay special attention to the ads. The questionnaire started with questions about demographics, their game affinity and whether they have an ad blocker installed. Next, participants saw a description of their task, stating that they will have to read several articles (articles were taken from a website offering free news content³), answer a comprehension question for each article and deactivate an ad that is placed within each article. The description of how to deactivate an ad changed depending on the assigned condition (Baseline, Paintball, Tetris, Monster). These three tasks were then presented to the user (in randomized order). As an example, one article was about group travel⁴ and the task was “*Please state benefits of group travel*”. Once participants found the article, deactivated the ad and answered the comprehension question, they were asked questions about the perception of the news article, and of the ad they had just deactivated.

For the news perception, we used Sundar’s news evaluation items [41], consisting of three subscales (Value, Credibility, Entertainment). The perception of ads was measured using the scale by Yang et al. [47] consisting of two subscales: Professionalism and Appropriateness. Both news perception and ad perception items were measured using 10-point Likert scales; for all remaining questionnaires 7-point Likert scales were used. To investigate the enjoyment of deactivating ads, the short German version of the Intrinsic Motivation Inventory [46] (“IMI”) followed after completing the three tasks, consisting of four subscales: Enjoyment, Competence, Choice and Pressure. For English-speaking participants, the scale was translated by a professional, bilingual translator. Afterwards, the perception of the news site regarding the overall user experience and the attitude towards the website was measured using the short version of the User Experience Questionnaire (UEQ-S) [39] and the “Attitudes Towards Site” scale developed by Chen and Wells [11] (having the subscales “Entertainment”, “Informativeness” and “Organization”). Next, participants were asked whether they would like to use an ad blocker or deactivate ads as they did before for an additional article, even though they were told afterwards that there would be no such additional article. This was done to get another indication of the perception of playfully deactivating ads. The aforementioned questionnaires also served

as distraction tasks, clearing the short-term memory prior to completing the word stem completion and recall/recognition tests [48], which are explained next.

To measure implicit brand memory, word stem completion tests followed [48]. In these tests, participants had to fill in the missing letters of a word stem to make it into a meaningful word. We included six word stems, of which three were stems from brand names from the previously deactivated ads. To measure unaided product and brand recall, two free-text fields followed, asking the participants to name any product or brand they can remember. Textual recognition tests followed, in which participants had to choose any brand or product they recognize (again, six brands were shown in randomized order, of which three were actually advertised, and six products, of which again three were actually advertised). Lastly, visual ad recognition tests followed, in which participants were shown six ads (in randomized order), of which three were the same as on the news site, and were asked to choose any ad they recognized.

Results

Overall, 72 participants were recruited (42 male, 29 female, 1 not specified), 18 participants for each group. This number of participants was informed by an a-priori performed power analysis (effect size $f=0.41$ [32] and a power of 80.75% [13]). Participants considered themselves gaming-affine ($M = 3.61$, $SD = 1.10$, $Mdn = 4.00$), claimed to frequently play video games ($M = 3.21$, $SD = 1.32$, $Mdn = 4.00$) and to have a passion for them ($M = 3.31$, $SD = 1.37$, $Mdn = 4.00$). 82% ($SD = 38.7\%$, $Mdn = 100\%$) have an ad blocker installed. 56.94% were aged 25-31, 36.11% 18-24 and 6.95% were aged 32 and older. The following sections present results from independent t-tests, comparing each game concept against the baseline, to investigate our hypotheses. It should be noted that our goal was not investigating effects between the game concepts (see **H1-H11**). We argue that such comparisons would not lead to valid conclusions, as the game concepts are not comparable due to their different specifics. Therefore, no pairwise comparisons have been made. All reported p-values were corrected for multiple comparisons using Benjamini and Hochberg’s False Discovery Rate, as described in [4]. Table 2 visualizes relevant descriptive data for each condition at a glance. Significant differences from the Baseline condition are colored.

Enjoyment and Acceptance. All game conditions scored significantly higher than the baseline on the “enjoyment” subscale of the IMI. Deactivating ads using the “Tetris” concept was perceived as significantly more enjoyable than the baseline ($t(34) = -3.88$, $p = 0.000$); this was also true for the “Paintball” ($t(34) = -3.37$, $p = 0.002$) and the “Monster” ($t(34)$

³www.brandpointcontent.com, last accessed January 14, 2019

⁴<https://bit.ly/2NOy7vR>, last accessed January 14, 2019

Table 2: Possible range of values and mean / standard deviation / median of all dependent variables for each condition. Green cells indicates positive, red negative significant effects compared to the baseline.

	Scale Range	Baseline	Tetris	Paintball	Monster
IMI Enjoyment	3 - 21	9.00 / 4.38 / 8.50	14.28 / 3.75 / 14.50	13.89 / 4.34 / 12.50	14.50 / 3.49 / 15.00
IMI Competence	3 - 21	14.94 / 4.48 / 15.00	15.44 / 4.34 / 15.50	14.28 / 4.11 / 14.50	18.06 / 4.05 / 19.00
IMI Choice	3 - 21	15.06 / 4.11 / 15.00	15.00 / 3.58 / 15.50	13.72 / 4.23 / 14.50	13.56 / 3.75 / 14.00
IMI Pressure (negated)	3 - 21	17.56 / 4.19 / 19.00	16.17 / 4.54 / 16.50	15.67 / 5.21 / 16.00	19.17 / 3.90 / 21.00
UEQ-S	7 - 49	36.33 / 4.19 / 35.50	36.50 / 7.00 / 36.50	38.56 / 7.33 / 39.50	34.67 / 7.43 / 34.50
Site Entertainment	4 - 28	16.83 / 5.07 / 16.50	15.89 / 5.86 / 15.50	18.56 / 5.22 / 19.00	16.67 / 5.37 / 17.00
Site Informativeness	4 - 28	20.17 / 4.00 / 20.50	18.17 / 5.10 / 17.50	21.00 / 3.90 / 20.50	19.06 / 4.09 / 19.00
Site Organization	4 - 28	21.61 / 3.05 / 22.00	23.00 / 3.50 / 23.00	23.67 / 3.41 / 24.00	24.39 / 3.26 / 25.00
News Value	1 - 10	7.25 / 1.44 / 7.38	6.46 / 1.35 / 6.17	7.27 / 1.38 / 7.17	5.96 / 1.59 / 6.21
News Credibility	1 - 10	7.19 / 1.26 / 7.25	6.28 / 1.56 / 6.38	7.45 / 1.21 / 7.00	6.35 / 1.15 / 6.25
News Entertainment	1 - 10	6.90 / 1.19 / 6.72	6.35 / 1.81 / 6.22	7.25 / 1.90 / 7.06	5.88 / 1.77 / 6.22
Ad Professionalism	1 - 10	5.65 / 1.73 / 5.50	5.37 / 1.50 / 5.22	5.73 / 1.79 / 5.78	5.43 / 1.25 / 5.33
Ad Appropriateness	1 - 10	6.41 / 2.59 / 6.50	6.49 / 1.70 / 6.67	5.88 / 2.36 / 6.33	6.69 / 2.27 / 7.39
Brand Recall	0 - 3	0.00 / 0.00 / 0.00	0.28 / 0.46 / 0.00	0.06 / 0.24 / 0.00	0.11 / 0.32 / 0.00
Product Recall	0 - 3	2.00 / 0.77 / 2.00	2.33 / 0.84 / 2.50	1.50 / 0.99 / 1.50	1.56 / 0.98 / 2.00
Brand Recognition	0 - 3	1.28 / 0.83 / 1.00	1.89 / 0.83 / 2.00	1.94 / 1.00 / 2.00	1.94 / 1.00 / 2.00
Product Recognition	0 - 3	2.28 / 0.58 / 2.00	2.72 / 0.46 / 3.00	2.44 / 0.86 / 3.00	2.56 / 0.62 / 3.00
Ad Recognition	0 - 3	2.56 / 0.62 / 3.00	2.83 / 0.38 / 3.00	2.72 / 0.75 / 3.00	2.78 / 0.43 / 3.00
Word Stems	0 - 3	0.50 / 0.62 / 0.00	0.67 / 0.69 / 1.00	0.61 / 0.61 / 1.00	0.67 / 0.78 / 0.50
Prefer Ad Blocker	0 - 100	83% / 38% / 100%	67% / 49% / 100%	89% / 32% / 100%	33% / 49% / 0%

= -4.17, $p = 0.000$) concepts. This provides strong evidence for **H1**: *Playfully deactivating ads is more enjoyable*. Furthermore, for reading a news article, we found that participants prefer to use an ad blocker instead of the game concepts for the “Tetris” (67% prefer to use an ad blocker) and the “Paintball” (89% prefer to use an ad blocker) concepts. However, the “Monster” concept is an exception: Here, only 33% of the participants preferred to use an ad blocker; thus 67% prefer to use the “Monster” game concept. When comparing these values against the baseline, the “Monster” game concept is the only one showing a significant effect. Therefore, **H2**: *A lower number of participants prefers using an ad blocker for reading a news article in the gamified conditions* is supported for the “Monster” concept, while no statement can be made for the other gamified concepts.

Product and Brand Recall. Descriptively, the number of correctly recalled brands is higher in every gamified condition than in the baseline (see Table 2). Participants in the “Tetris” condition recalled a significantly higher number of brands correctly ($t(34) = -2.56$, $p = 0.045$). For both other conditions, no significant effect was found. These results support **H3**: *Brand recall is higher in the gamified conditions* for the “Tetris” concept, while no statement can be made for the “Paintball” and “Monster” concepts. Additionally, there

were no significant differences between the baseline and any of the gamified conditions in the number of correctly recalled products; thus our data do not support **H4**: *Product recall is higher in the gamified conditions*.

Product, Brand and Ad Recognition. We analyzed the number of correctly recognized textual representations of products and brands and of recognized ads. Our results show that participants recognized significantly more brands correctly in all gamified conditions than in the baseline (Tetris: $t(34) = -2.21$, $p = 0.036$); Paintball: $t(34) = -2.18$, $p = 0.036$); Monster: $t(34) = -2.18$, $p = 0.036$). This provides strong evidence for **H5**: *Brand recognition is higher in the gamified conditions*. Regarding product recognition, we found a significant difference between the “Tetris” condition and the baseline ($t(34) = -2.56$, $p = 0.045$). However, no significant effects were found in the “Paintball” and “Monster” conditions. Thus, **H6**: *Product recognition is higher in the gamified conditions* is only supported for the “Tetris” concept. Lastly, regarding ad recognition, we did not find evidence supporting **H7**: *Ad recognition is higher in the gamified conditions*.

Word Stem Tests. Although the number of correct brands is higher in all gamified conditions, no significant effects could be found supporting **H8**: *Implicit brand memory is higher in gamified conditions*.

Perception of the News Website, its Articles and the Ads. Only the “Monster” condition significantly influences the attitude toward the site and the perception of news articles. We found a significant effect on the “organization” subscale of the Attitude Toward the Site scale ($t(34) = -2.64, p = 0.036$), showing that the “Monster” concept increased how organized participants considered the website to be. However, no effect was found for the UEQ. At the same time, participants perceived the news articles as significantly less valuable ($t(34) = 2.56, p = 0.045$) in the “Monster” condition. Overall these findings support evidence for **H9**: *Gamification enhances the perception of the website* for the “Monster” concept. Also, **H10**: *Gamification decreases the perception of news articles* is supported for the “Monster” concept. No evidence was found for the other gamified conditions. Also, no evidence for **H11**: *Gamification enhances the perception of ads* was found.

Discussion

Our results demonstrate that deactivating ads playfully is enjoyable for users, as was shown by the increased IMI enjoyment score for all gamification conditions (**H1**). The fact that the “Monster” concept was even preferred over using an ad blocker for reading a news article further supports this finding (**H2**). The reason why only the “Monster” game concept was preferred over using an ad blocker might be because it is the only concept allowing to unlock virtual rewards, stimulating users’ feeling of accomplishment [18]. Moreover, we found that each gamified condition lead to at least one increased measure of explicit memory, thus indicating that deactivating ads playfully has the potential to increase the effectiveness of ads (**H3-H6**). Considering that the “Tetris” concept, requiring the most user interaction, showed the highest number of significant effects on explicit memory measures, an explanation could be that the level of interaction is a deciding cause. This would be in line with previous research [24, 35]. Also, the animations used in the “Monster” concept and the fact that ads were covered with color splashes in the “Paintball” concept could explain why these concepts showed less of an effect on explicit memory [42]. The reason for not finding any effects regarding visual ad recognition (**H7**) might be related to the picture superiority effect [33], stating that images are more likely to be remembered than words, which might lead to the high ad recognition in all groups.

Regarding implicit memory, no effects were found (**H8**). This might be due to the comparatively conservative baseline condition, in which we required users to interact with the ad, which in itself affects implicit memory measures positively [40]. Given the descriptive data regarding the word stem tests, testing more participants might lead to finding an effect. We also found that the “Monster” condition led to

a more positive perception of the website (**H9**). This might be explainable by the fact that the positive perception of playfully deactivating ads, was transferred to the website, similarly as was shown for certain types of ads [9, 31]. However, the value of news articles was seen as significantly lower in the “Monster” condition (**H10**). This hints that the playfulness of the “Monster” concept was perceived as inappropriate when reading news articles. Lastly, we could not find evidence that augmenting ads with game elements has a positive effect on the attitude towards the ad (**H11**). However, it should be noted that the perception of ads was measured using Professionalism and Appropriateness; thus effects might be found for other criteria, like product involvement or purchase intentions, as was shown in [5]. As a limitation, it should be noted that our results could be different outside lab conditions. In the wild, the current context of the user should be considered, because playfully deactivating ads might be disturbing.

6 CONCLUSION AND FUTURE WORK

We investigated the user enjoyment and the advertising effectiveness of playfully deactivating ads. We followed a user-centered design approach, using storyboards for eight game concepts and evaluating the users’ perception of them. Afterwards, three well-perceived concepts were implemented and the impact of playfully deactivating ads on ad effectiveness and user enjoyment was evaluated. Our results demonstrate that playfully deactivating ads is enjoyable, with one game concept even being preferred over an ad blocker. Just as important, we found that each gamified concept had positive effects on brand or product memory, showing that our approach also offers added value for web service providers.

An important next step is investigating our approach in-the-wild, e.g. by developing a browser extension that allows users to playfully deactivate ads. It should also be analyzed how a combination of blocking ads and the approach presented in this paper is perceived; allowing users to playfully deactivate an ad once to get rid of ads for a certain timespan seems promising. Although the realized concepts were informed by a pre-study and shown to have positive effects, there might be other concepts leading to different results. Following on that, establishing design guidelines and defining the design space for gamified ads are important next steps. Last but not least, qualitative research should be conducted to learn more about the reasons for our findings and how to integrate our approach into the browsing behavior of users.

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