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Understanding the uses and effects of interactive features in digital magazines

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ABSTRACT

This study tests a theoretical framework to explain the persuasive impact of interactive magazine ads on consumers' ad and brand attitudes. To obtain realistic (unforced) responses, a field experiment was conducted with a one-factor (interactive vs. non-interactive magazine ad) between-subjects design ($N=98$). Results showed that, although they rarely used it, participants positively evaluated the presence of an interactive feature in a digital magazine ad. Furthermore, parallel-mediation analyses revealed that the interactive magazine ad was perceived as more interactive and more surprising than the non-interactive ad, which ultimately positively impacted consumers' attitudes towards the magazine. A second real-life setting experiment ($N=121$) confirmed and extended these findings by revealing that the mediation effects were even stronger when consumers had used the interactive feature (vs. only seen). In addition, the relationship between interactive magazine ads and consumers' attitudinal responses was explained slightly better by 'perceived surprise' than by 'perceived interactivity'.

Keywords: magazine ad interactivity; online advertising; digital magazines; in-app analytics; perceived surprise; perceived interactivity

INTRODUCTION

The digital transformation of media markets and the tremendous success of tablets (Apple, 2010; Pew Research Center, 2017) have stimulated magazine publishers to launch digital (replica) editions of their print publications. These digital editions (hereafter called digital magazines) have been defined as editions in which each issue's content and design are identical to the original print issue. In addition, they enable interactivity through the implementation of interactive features (Sundar & Kim, 2005). Such interactive features give readers control over the presentation of the content (e.g., photo galleries or movie clips) or the flow of the content (e.g., hyperlinks), or they facilitate online brand-related discussions (e.g., social media buttons; Chung, 2007; 2008). Advertisements in digital magazines may also enable interactivity, which is intended to make consumers 'actively engaged' with the advertised content instead of 'passive message receivers' (Liu & Shrum, 2002).

Despite the abundance of research in the field of digital advertising, it is currently unknown whether readers are actually willing to use the interactive features in digital magazine advertisements (hereafter called interactive magazine ads), and what the persuasive influence is of these interactive magazine ads on consumers' ad and brand attitudes. The reason is that digital magazines differ from previously studied digital media, such as websites, in a number of ways. First, 'reading a magazine' is typically characterized as a predominately passive and lean-back behaviour (Bronner & Neijens, 2006). Consequently, the interactive features in digital magazine ads could be ignored by consumers, or could even generate negative advertising outcomes. For instance, if consumers perceive the features as out-of-place, this could cause irritation, which could spill over to the advertised brand. In addition, irritation could be strengthened by the fact that, unlike for most websites, consumers need to pay to get access to the content of digital magazines.

Second, digital magazines differ from websites in their 'page-turning' feel, and fewer interactive navigation possibilities. Research has shown that due to these characteristics digital replicas are read differently than websites, with the former being read more linear (from beginning to end), and less fragmented and selective than the latter (Neijens & Voorveld, 2018). Therefore, the effects of interactive magazine ads on consumers' attitudinal responses might differ from the effects of interactive website ads. Last, compared to advertising on digital TV (e.g., another form of a digital media; Cauberghe & De Pelsmacker, 2010), magazine ads are presented in a different modality. While the content of digital TV is predominately audiovisual, the main modality of digital magazines is static text and pictures.

Consequently, to address the lack of knowledge of how interactive magazine ads affect consumers' attitudinal responses, the current study attempts to shed some light on this topic. Two real-life setting experiments were conducted in which magazine consumers were exposed to either an interactive or non-interactive ad while reading a digital magazine. This experimental setting allowed participants to read the digital magazine in

their own environment, on their own tablets, in the way they preferred. In-app analytics (i.e., digital data trackers) were used to track all participant in-app activities while reading the digital magazine. As this method allows for examining consumers' natural (i.e., unforced) responses, the first aim of this study was to investigate whether and how consumers use the interactive features placed in digital magazines advertisements (Study 1).

The second aim of this study was to develop and test a theoretical framework to explain the persuasive impact of interactive magazine ads on consumers' attitudinal responses. To do so, we tested the mediating effects of perceived interactivity and perceived surprise simultaneously (Studies 1 and 2), and examined whether these effects differed for consumers who had 'used' the interactive feature vs. only 'seen' it (Study 2). General interactivity studies, which predominately use student samples and forced exposure, have demonstrated that perceived interactivity can mediate the relationship between platform (e.g., website) interactivity and consumers' attitudinal responses (e.g., website attitude; Rauwers, Voorveld, & Neijens, 2016; Wu, 2005). However, some researchers have argued that these attitudinal responses could also be explained by another process, namely perceived surprise (Voorveld, Neijens, & Smit, 2011). Because the effects of perceived surprise may be short-lived (Alden, Mukherjee, & Hoyer, 2000), it is important to determine which process is the main driver of the interactivity effects.

THEORETICAL BACKGROUND

Consumer responses towards magazine ad interactivity

Magazines are typically read when people want to relax, take a break, or pass the time (Bronner & Neijens, 2006; Malthouse, Calder, & Eadie, 2003). This passive character of magazine reading contrasts with the active nature of interactive features. While static magazine content can be consumed passively (e.g., while lying on the couch), interactive features aim to actively engage the consumer (e.g., the consumer needs to actively use the interactive features to profit from their benefits). It is therefore unknown whether consumers will embrace the interactive features in digital magazines or if they will view them as out of place and distracting.

To our knowledge, the literature shows no empirical studies investigating whether and how consumers use interactive features placed in digital magazine advertisements, or how the presence of these features affects important outcome measures such as ad exposure time and consumers' attitudinal responses. These outcome measures are critical for advertisers to determine the benefit of developing interactive magazine ads over static ads (e.g., digital copies of existing print advertisements). Therefore, this study attempts to answer the following research questions:

- RQ1:** (a) Do consumers use the interactive features placed in digital magazine advertisements? (b) How do consumers evaluate the presence of interactive features in digital magazine advertisements? (c) Does the presence of an interactive feature affect consumers' ad exposure time?

The persuasive impact of interactive magazine ads on consumers' attitudinal responses

In the context of digital magazine advertising, the persuasive impact of ad interactivity on consumers' attitudinal responses has not yet been examined. However, there are studies that have evaluated the influence of interactivity on other types of online advertising, like mobile (phone) advertising, website advertising, and digital TV advertising (e.g., Brown, 2002; Campbell & Wright, 2008; Cauberghe & De Pelsmacker, 2010; Gao, Rau, & Salvendy, 2009; Sundar & Kim, 2005). The findings of these studies reveal a consistent pattern, that adding ad interactivity has a positive influence on consumers' ad and brand attitudes. However, it is unclear which processes underlie these effects. In the following, two potential underlying processes will be discussed.

First underlying process: Perceived interactivity

The effect of interactive magazine ads on perceived interactivity

Perceived interactivity is the extent to which consumers perceive a specific piece of digital content (e.g., websites or digital magazine ads) as truly interactive (Voorveld et al., 2011; Voorveld, Van Noort, & Duijn, 2013). This term should not be confused with the actual interactivity of the content, which describes the potential for interactivity as determined by the sum of all available interactive elements (Voorveld et al., 2011; Wu, 2005). It is important to treat each interactivity concept separately (Song & Zinkhan, 2008), as various studies have revealed that an increase in the number of interactive features (i.e., actual interactivity) does not always elicit stronger interactivity perceptions (e.g., Lee, Lee, & Stout, 2004; McMillan, 2002).

Liu & Shrum (2002) identified three dimensions of perceived interactivity: (1) the *two-way communication* dimension, described as 'the ability for reciprocal communication between companies and users, and users and users' (Liu & Shrum, 2002; p. 55); (2) the *synchronicity* dimension, described as 'the degree to which users' input into a communication and the response they receive from the communication are simultaneous' (Liu & Shrum, 2002; p. 55); and (3) the *active control* dimension, described as the ability to 'customize the information flow and [to] jump from one location [. . .] to another' (Liu & Shrum, 2002; p. 54). This study focused on the active control dimension by allowing consumers to control the flow of information. To achieve this, an interactive movie clip feature was integrated into a digital magazine advertisement, allowing consumers to watch additional audiovisual commercial content.

In previous research, some studies have already investigated the impact of interactive active control features on consumers' interactivity perceptions. For instance, Sundar and Kim (2005) found that the more hyperlinks a website banner contained, the more interactive the advertisement was considered. In another study, similar results were obtained when the effects of hyperlinks in a mobile (phone) advertisement were evaluated (Gau et al., 2009). The results of these studies suggest that the presence of interactive active control features can have a positive influence on consumers' interactivity perceptions, which leads to the following hypothesis:

- H1:** Digital magazine advertisements with interactive (active control) features will be perceived as more interactive than digital magazine advertisements without these features.

The effects of perceived interactivity on ad attitude and brand attitude

Several studies have demonstrated that perceived interactivity mediates the relationship between actual interactivity and consumers' attitudinal responses (e.g., Rauwers et al., 2016; Yang & Shen, 2018). For instance, Wu (2005) showed that increasing the number of interactive features in a website resulted in that website being viewed as more interactive by consumers, positively affecting the consumers' attitudes towards the website. However, in the context of digital magazine advertising, the role of perceived interactivity in mediating consumers' attitudinal responses has not yet been tested.

In previous research on other online advertising formats, it has been revealed that online advertisements that are considered as highly interactive generate more positive attitudinal responses than those that are considered as less interactive (e.g., Gau et al., 2009). Since we believe that a digital magazine advertisement with interactive control features will be perceived as highly interactive (H1), and because perceived interactivity has been shown to mediate consumers' attitudinal responses in other advertising contexts, we further hypothesize that perceived interactivity will also underlie the effects interactive magazine ads have on consumers' attitudinal responses (see Figure 1):

- H2:** Interactive magazine ads have positive effects on (a) ad attitude and (b) brand attitude through perceived interactivity.

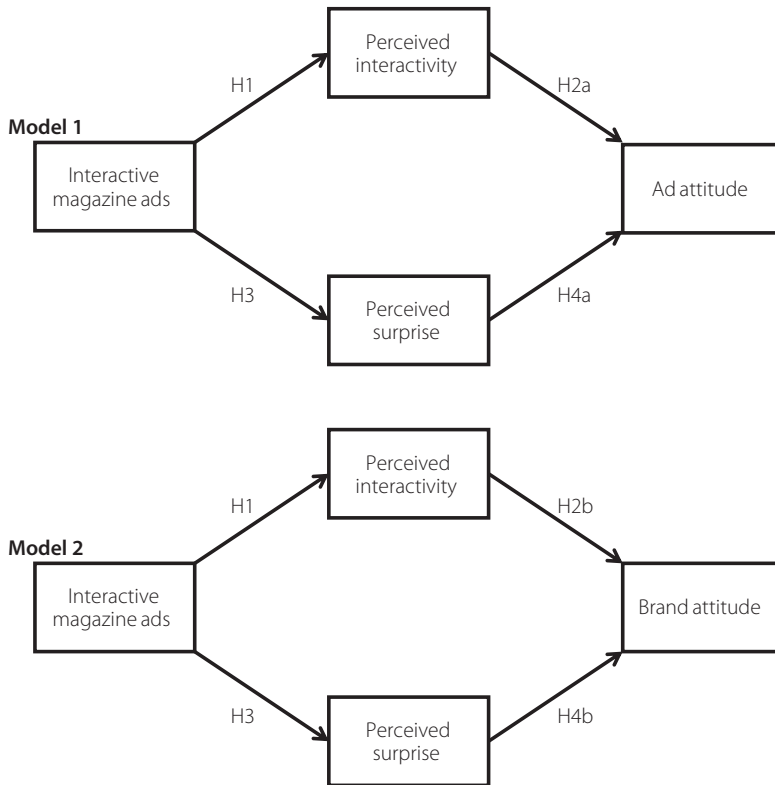


Figure 1. Hypotheses 1–4 visualized.

Second underlying process: Perceived surprise

The effect of interactive magazine ads on perceived surprise

Surprise is a neutral and short-lived sensation that arises when consumers are confronted with an unfamiliar stimulus or an unexpected combination of elements (Alden et al., 2000; Meyer, Niepel, Rudolph, & Schützwohl, 1991). Advertisements can also elicit a feeling of surprise when they are executed in an unusual way (Hutter, 2015). For instance, Brown (2002) found that website banners that contain novel (i.e., unexpected) interactive features were perceived as more surprising than those that did not contain these interactive features. Because most digital magazine ads currently do not contain any form of ad interactivity, we hypothesize that adding interactive features to these advertisements will elicit a feeling of surprise from the consumer.

- H3:** Digital magazine advertisements with interactive features will be perceived as more surprising than digital magazine advertisements without interactive features.

The effects of perceived surprise on ad attitude and brand attitude

According to Hutter and Hoffmann (2014), surprise is a sensation that intensifies feelings that are already present. Eliciting surprise can enhance a consumer's positive feelings about an advertisement, thereby enhancing consumers' attitudes towards the ad and the brand. Within the field of guerilla marketing, several studies have provided evidence for this claim (e.g., Dahlén, 2005; Hutter & Hoffmann, 2014), showing that perceived surprise is positively related to consumers' attitudinal responses. However, this relationship has not yet been evaluated in the context of digital magazine advertising. Because we hypothesize that interactive features in a digital magazine advertisement will elicit feelings of surprise (H3), we further hypothesize that perceived surprise will mediate the relationship between interactive magazine ads and consumers' attitudinal responses (see Figure 1):

- H4:** Interactive magazine ads have positive effects on (a) ad attitude and (b) brand attitude through perceived surprise.

Perceived Interactivity vs. perceived surprise

The current literature suggests that both perceived interactivity and perceived surprise may be responsible for the persuasive effects of (magazine) ad interactivity on consumers' attitudinal responses. Because there are currently no empirical studies comparing the relative effects of these mechanisms on consumer responses, the following research question was posed:

- RQ2:** To what extent do perceived interactivity and perceived surprise differ in their ability to explain the effects of interactive magazine ads on (a) ad attitude and (b) brand attitude?

STUDY 1

Methods

Experimental design

A field experiment was conducted with a one-factor (magazine ad interactivity: interactive vs. non-interactive magazine ad) between-subjects design. The current study was part of a larger project, wherein participants used a digital magazine app (i.e., *The Digital Flair App*) for eight weeks. Each week a new issue of *Flair* (i.e., a Dutch women's magazine) was released within the app. On the third week, participants were exposed to either an interactive or non-interactive digital magazine ad (see 'Stimulus Materials') integrated within the *Flair* issue.

Recruitment of the participants and sample size

Participants were recruited via social media and with email invitations, which were sent by Sanoma (one of the top five largest magazine publishers in Europe) to 40,000 magazine consumers. Participants were told that Sanoma had developed a new Android app for *Flair* magazine, and that they were searching for volunteers to test it. In exchange, volunteers would receive a free eight-week subscription to *The Digital Flair App* and an access code for two additional digital magazines upon completion of a questionnaire.

To qualify for study participation, volunteers had to have an interest in reading *Flair* magazine and access to an Android tablet. In total, 247 volunteers met these research criteria. However, 149 volunteers did not complete the study because of participant dropout ($n = 36$) or not being exposed to the manipulated advertisements (i.e., they did not open the magazine pages on which the study stimuli were placed; $n = 113$). The final sample consisted of 98 participants (98.0% female¹; $M_{\text{age}} = 41.35$; $SD = 11.47$), who were randomly assigned to the interactive condition ($n = 45$) or the non-interactive condition ($n = 53$).

Stimulus materials

The Digital Flair App

The app was exclusively developed for this project and consisted of an online kiosk wherein the *Flair* issues were released. *Flair* is a weekly magazine that is targeted at women between 25 and 45 years of age. The magazine is published by Sanoma, and is available in both print and digital formats. For the creation of the app, authentic issues of *Flair* magazine were used, which were released in the app on the same date that they also became available in online stores.

For each user, in-app analytics were installed to register all activities that the user performed within the app, along with the date and time when these activities were executed. For instance, a registered user activity output could appear as follows: ['USER1', 'MAGAZINE_PAGE', '66', '2016-03-02 14:03:50']. This output identifies the user (USER1), the activity performed (opened magazine page 66), and the date and time at which the activity was performed (on 2 March 2016 at 14:03:50). These tracking data were automatically sent to an online database wherein all user activity information was converted into a single dataset.

Manipulating magazine ad interactivity: an interactive vs. a non-interactive magazine ad

Magazine ad interactivity was manipulated by either integrating or omitting an interactive movie clip feature within a digital magazine advertisement for the brand *Chanel*. The advertisement covered two full pages in *Flair* magazine. In the interactive condition, the left

¹ Although the magazine was specifically targeted at women, men could also participate if they were interested in reading the magazine content.

page of the advertisement displayed a large promotional picture for the fragrance *Chanel N°5*, whereas the right page contained the name of the brand, a picture of the perfume bottle, and – most importantly – the interactive movie clip feature (see Figure 2). The movie clip feature was designed to be similar to a YouTube clip (e.g., containing a play button), and displayed a screenshot of *Chanel's* television commercial. When the play button was clicked, the commercial played full-screen for a maximum duration of 196 seconds. In the non-interactive condition, the composition of the advertisement was identical to the interactive condition, but the interactive movie clip feature was replaced with a static screenshot (Figure 2).

Procedure

Prior to the study, all participants provided informed consent and completed a short survey, which collected demographic and contact information. On the same day, all participants received an email with a link to *The Digital Flair App*, and were asked to install the app on their tablet. Participants were informed that every week a new issue of *Flair* would be released in the app, and that after the third issue they would receive a questionnaire. Until that time, participants were free to use the app as they preferred.

On release of the third *Flair* issue, participants were exposed to either the interactive or the non-interactive version of the *Chanel* advertisement, depending on the experimental group to which they were assigned. Five days after the release of this issue, participants received an email with a link to a questionnaire asking questions about their experiences with the app and the *Chanel* advertisement. Participants were instructed to close *The Digital Flair App* and to not reopen it before they had finished the questionnaire. The survey asked general questions about the digital magazine (e.g., magazine content attitude), after which it evaluated the participants' brand attitude towards *Chanel*. Next, participants were shown a picture of the *Chanel* advertisement and asked if they could remember having viewed the advertisement. Subsequently, the following ad-related variables were measured: ad attitude, movie clip attitude (only in the interactive condition), perceived surprise, and perceived interactivity (only for those who remembered having viewed the advertisement). After completing the questionnaire, participants were thanked and sent an access code for two additional digital magazines as compensation for their participation. This procedure was approved by the Ethical Committee of the Faculty of Social Sciences, University of Amsterdam.

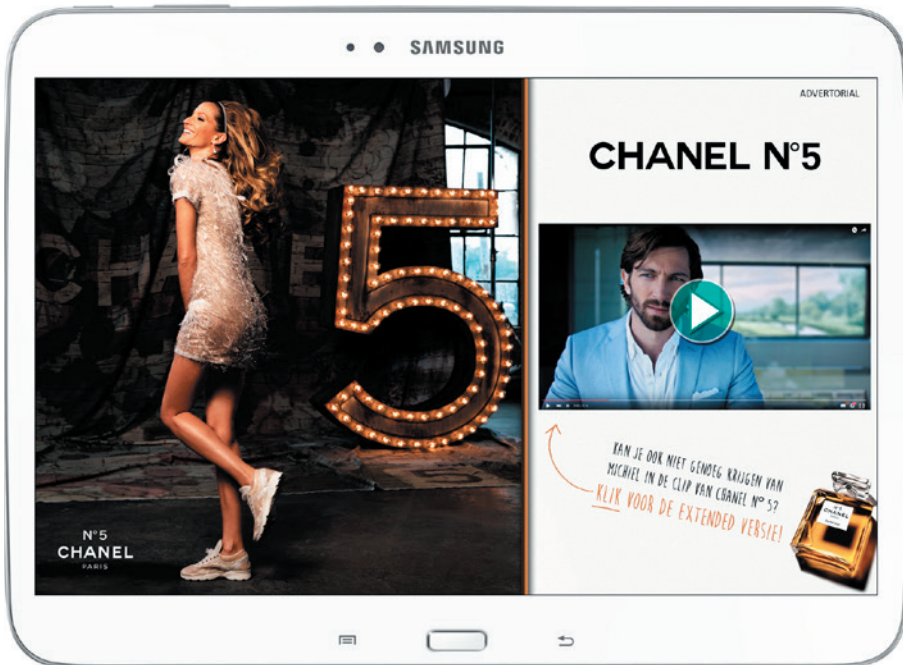


Figure 2. The two digital versions of the Chanel advertisement. Above: The non-interactive version; Below: The interactive version with the interactive movie clip feature.

Measures

Processing variables

Variables were measured using a 7-point Likert response format. Perceived interactivity was evaluated using four items modelled from Liu (2003) that included, 'When I arrived at the pages with the advertisement, I had the feeling that I had some control over the advertisement content' and 'When I arrived at the pages with the advertisement, my actions determined the information I got to see' (1 = *strongly disagree*, 7 = *strongly agree*; $EV = 2.81$; $R^2 = .70$; $\alpha = .86$; $M = 4.07$, $SD = 1.24$). Perceived surprise was measured with one item (adopted from Hutter and Hoffmann, 2014) that asked the participant to complete the statement, 'The advertisement for Chanel was ...' (1 = *not surprising*, 7 = *surprising*; $M = 4.16$, $SD = 1.68$).

Attitudinal responses

Ad attitude was measured with six items on a 7-point semantic differential scale aimed at evaluating the participants' attitudes towards the advertisement: *not useful/useful*, *not valuable/valuable*, *not interesting/interesting*, *terrible/nice*, *not entertaining/entertaining*, and *unpleasant/pleasant* (Crites, Fabrigar, & Petty, 1994; Keer, Van den Putte, & Neijens, 2010). The items all loaded on one factor that proved to be reliable ($EV = 4.77$; $R^2 = .80$; $\alpha = .95$; $M = 4.01$, $SD = 1.40$). Brand attitude and movie clip attitude were measured in a similar manner as ad attitude ($EV = 4.84$; $R^2 = .80$; $\alpha = .95$; $M = 4.05$, $SD = 1.36$), except the latter being tested with only two items: *not useful/useful*, and *terrible/nice* ($r = .79$, $p < .001$; $M = 4.58$, $SD = 1.63$).

In-app analytics

During the 8-week long project, the in-app analytics tool created a dataset that consisted of 172,492 unique cases. Each case represented a single action performed by a participant inside *The Digital Flair App*. To analyse these data, several Python-scripts were written to provide the following information: movie clip feature use, ad exposure time, movie clip exposure time, and app opening (described in the 'Control Variables' section). Use of the movie clip feature was determined by whether or not a participant in the interactive condition played the interactive movie clip (0 = *no*, 1 = *yes*; % that played the clip: 11.1). Ad exposure time reflected the time in seconds that a participant was exposed to the advertisement ($M = 5.19$, $SD = 3.03$). Movie clip exposure time was evaluated only in those participants who were exposed to the interactive magazine ad and reflected the time in seconds that a participant watched the movie clip ($M = 182.40$, $SD = 97.45$).

Control variables and randomization checks

Several variables were evaluated to ensure that the effects of the independent variable were not influenced by other differences among the experimental groups. First, the percentage of participants that opened the magazine app while they were filling in the

questionnaire was evaluated (app opening: 0 = *no*, 1 = *yes*; % that opened the app: 23.5). Next, the participants' magazine content attitude was measured with six items on a 7-point semantic differential scale aimed at evaluating participants' attitude towards the magazine content ($EV = 4.06$; $R^2 = .68$; $\alpha = .90$; $M = 5.34$, $SD = 0.93$). Finally, participants' age, gender, and education were evaluated to verify randomization.

Results

Randomization

The experimental groups did not differ with respect to participant age, $F(1, 96) = 1.79$, $p = .184$, gender, $\chi^2(1) = 1.73$, $p = .188$, level of education, $F(1, 96) = 0.63$, $p = .428$, percentage of participants that opened the magazine app during the questionnaire, $\chi^2(1) = 0.07$, $p = .788$, or magazine content attitude, $F(1, 96) = 0.00$, $p = .966$. These data confirm that the differences across the experimental groups were not the result of variations in these background variables.

Consumer responses towards magazine ad interactivity

To answer RQ1a, we investigated whether participants in the interactive condition used the interactive movie clip feature. According to the in-app analytics, only 5 out of the 45 participants (11.1%) played the movie clip feature, and those that played it watched the movie clip for 182.40 seconds ($SD = 97.45$). These data suggest that although participants rarely used the interactive movie clip feature, those that did, often watched the clip completely.

We then examined how participants in the interactive condition evaluated the presence of the interactive movie clip feature within the digital magazine advertisement. A one-sample t-test showed that, on average, participants liked the presence of the interactive movie clip feature ($M = 4.58$, $SD = 1.63$), and that the mean score was even significantly higher than the midpoint of the scale, $t(44) = 2.38$, $p = .022$. Therefore, despite the fact that participants rarely used the interactive feature, they evaluated its presence as highly positive (RQ1b).

Finally, to answer RQ1c, we tested how the presence of the interactive movie clip feature affected consumers' ad exposure time. The in-app analytics revealed that, on average, participants were exposed to the advertisements for 5.19 seconds ($SD = 3.03$), with a minimum of 1 second and a maximum of 13 seconds (movie clip exposure time excluded). Furthermore, ad exposure time in the interactive condition was, on average, almost one second longer ($M = 5.59$, $SD = 2.92$) than that in the non-interactive condition ($M = 4.84$, $SD = 3.12$). However, an analysis of variance demonstrated that this effect was non-significant, $F(1, 78) = 1.25$, $p = .268$.

Direct effects of interactive magazine ads on perceived surprise and perceived interactivity

To test whether the interactive version of the Chanel advertisement was perceived as more interactive (H1) and more surprising (H3) than the non-interactive version, a multivariate analysis of variance (MANOVA) was conducted (see Table 1). The results revealed significant differences between the experimental groups with regard to both perceived interactivity, $F(1, 70) = 11.35, p = .001$, and perceived surprise, $F(1, 70) = 4.26, p = .043$. More specifically, the interactive version of the advertisement was perceived as more interactive and as more surprising than the non-interactive version, which supports Hypotheses 1 and 3.

Table 1. MANOVA results for Study 1 and Study 2.

Dependent variables	Study 1: Means (SD)			Study 2: Means (SD)			
	Non-interactive	Interactive	<i>p</i>	Non-interactive	Interactive (see)	Interactive (use)	<i>p</i>
<i>Processing variables</i>							
Perceived surprise	4.27(1.48)	5.00(1.52)	.043	3.24(1.46) ^a	3.92(1.42) ^b	5.14(1.58) ^{ab}	< .001
Perceived interactivity	3.62(1.23)	4.54(1.09)	.001	3.53(1.16) ^{ab}	4.22(1.27) ^a	4.72(1.01) ^b	< .001
<i>Attitudinal responses</i>							
Ad attitude	4.21(1.39)	4.49 (1.22)	.377	3.65(1.23) ^a	3.66(1.59) ^b	4.71(1.12) ^{ab}	< .001
Brand attitude	4.29(1.34)	4.40(1.15)	.706	4.22(1.12)	3.99(1.55) ^a	4.68(1.06) ^a	.045

Note. Results of Study 2: ^a and ^b show the means that differ significantly (Bonferroni *post-hoc* analysis).

Mediation effects through perceived interactivity and perceived surprise

To test Hypotheses 2 and 4, two parallel mediation models were run using Hayes' (2012) PROCESS macro (Model 4). Both models used interactive magazine ads as the independent variable and perceived interactivity and perceived surprise as the two parallel mediators. For the dependent variables, model 1 used ad attitude and model 2 used brand attitude. The results of both models are described below.

Model 1: The mediated effects on ad attitude

In the first parallel mediation model, the assumption that perceived interactivity (H2a) and perceived surprise (H4a) positively influence the relationship between interactive magazine ads and ad attitude was tested. In support of this assumption, PROCESS revealed positive mediation effects on ad attitude through perceived interactivity (indirect effect = 0.18, boot $SE = 0.14$, BCI [.004, .575]) and perceived surprise (indirect effect = 0.45, boot $SE = 0.23$, BCI [.055, 1.005]). More specifically, the interactive advertisement was evaluated as more interactive ($b = 0.92, SE = 0.27, p = .001$) and more surprising ($b = 0.73, SE = 0.35, p = .043$) than the non-interactive advertisement, which subsequently improved ad attitude ($b_{\text{interactivity}} = 0.20, SE = 0.09, p = .032$; $b_{\text{surprise}} = 0.62, SE = 0.07, p < .001$), confirming Hypotheses 2a and 4a (see Figure 3).

These data suggest that both perceived interactivity and perceived surprise mediate the relationship between interactive magazine ads and ad attitude. To answer RQ2a, the strength of the indirect effects of perceived interactivity and perceived surprise were compared using the contrast module in PROCESS. The results revealed that there were no significant differences between the indirect effects (contrast = 0.27, BCI [-.278, .852]), suggesting that perceived interactivity and perceived surprise similarly influence ad attitude.

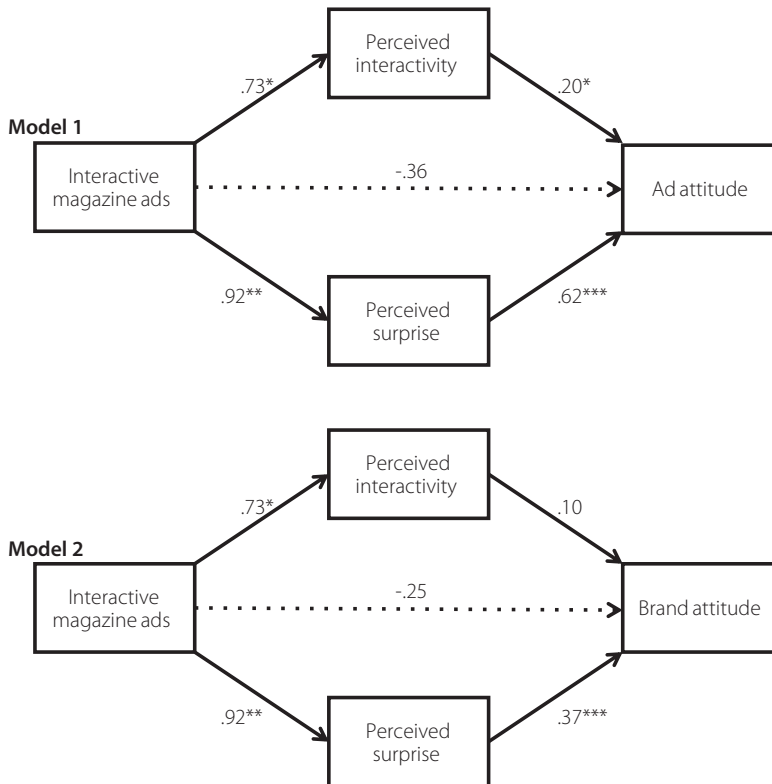


Figure 3. Tested mediations through perceived interactivity and perceived surprise.
* = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Model 2: The mediated effects on brand attitude

In the second parallel mediation model, the ability for perceived interactivity (H2b) and perceived surprise (H4b) to mediate the effects of interactive magazine ads on brand attitude was tested. Unexpectedly, PROCESS demonstrated that perceived interactivity did not mediate the effect of interactive magazine ads on brand attitude (indirect effect = 0.09, boot SE = 0.14, BCI [-.110, .483]), thus not supporting Hypothesis 2b. However, a significant indirect effect was found through perceived surprise (indirect effect = 0.27, boot SE =

0.15, BCI [.047, .668]), revealing that the elicitation of surprise had a positive influence on participants' brand attitude ($b = 0.37$, $SE = 0.09$, $p < .001$), supporting Hypothesis 4b. These results indicate that only perceived surprise mediated the effect of interactive magazine ads on brand attitude (see Figure 3), suggesting that this process is the strongest predictor of the effects on brand attitude (RQ2b).

Conclusion and discussion

The results of Study 1 showed that our interactive movie clip feature was only rarely used, and that its presence had no substantial impact on consumers' ad exposure time. Nevertheless, despite its limited use, people positively evaluated its presence within the digital magazine advertisement.

Furthermore, mediation analyses revealed that adding an interactive feature to a digital magazine advertisement activated both our proposed processes: perceived interactivity and perceived surprise. More specifically, the interactive version of our advertisement was evaluated as more interactive and as more surprising than its non-interactive counterpart. Next, full mediation analyses showed that both perceived interactivity and perceived surprise mediated the relationship between interactive magazine ads and consumers' ad attitude, and that the indirect effects did not significantly differ in strength from each other. Besides, the analyses also revealed that perceived surprise mediated the effects of interactive magazine ads on consumers' brand attitude; however, no significant indirect effect was found through perceived interactivity.

Hence, these data suggest that both perceived interactivity and, especially, perceived surprise are important to consider when explaining the effects of ad interactivity on consumers' attitudinal responses in the context of digital magazines. However, due to the fact that in this study only a handful of people had actually used the interactive feature, the question arises whether the found persuasive effects of interactive magazine ads could be different for consumers who have actually 'used' the interactive feature vs. only having 'seen' it.

On the one hand, according to the Dual-Process Model of Interactivity Effects (Liu & Shrum, 2009), exposure to an interactive feature can already be enough to improve consumers' attitudinal responses, as consumers will process the feature as a positive peripheral cue. On the other hand, it could also be argued that these persuasive effects might be even stronger when consumers have actually 'used' the interactive feature: by using the interactive feature, consumers can truly experience the interactive functionality of the feature in the digital magazine ad, which could make them evaluate the ad as more interactive and surprising, which ultimately translates into more positive attitudinal responses. Therefore, to gain a more complete understanding of how ad interactivity in digital magazines ads affects consumers' attitudinal responses, we decided to design a new experiment (Study 2) in which 'use of the interactive feature' is manipulated.

STUDY 2

The aim of Study 2 is to replicate the findings of Study 1, and to extend them by adding a condition in which participants were explicitly instructed to use the interactive feature. More specifically, this experiment comprised three experimental conditions: a condition in which participants were instructed to use the interactive feature, a condition in which participants only observed the interactive feature, and a non-interactive condition. This forced-exposure approach will enable us to provide insights into whether or not our proposed theoretical framework that was demonstrated in Study 1, is applicable to consumers who have actually 'used' the interactive feature as well as to consumers who have only 'seen' it, and how 'use of the interactive feature' influences the strength of the persuasive effects.

Methods

Experimental design and participants

An experiment was conducted with a between-subjects design with three conditions: (1) an interactive condition in which participants actually used the interactive feature; (2) an interactive condition in which participants only saw the interactive feature; and (3) a non-interactive condition. Participants were recruited via email by PanelClix, an ISO certified market research company. To qualify for participation, subjects had to be female, between 25 and 45 years of age, and to have access to an Android tablet. Of the 248 women who were willing to participate, 75 dropped out as they reported being unable to install *The Digital Flair App* on their tablet. Further, another 52 participants had to be excluded, as our in-app analytics revealed that these participants had not used *The Digital Flair App* (in contrast to what they had reported; $n = 34$) or had not followed our research instructions ($n = 18$). The final sample for this study therefore consisted of 121 participants ($M_{\text{age}} = 34.31$; $SD = 6.06$): 43 in the interactive 'use' condition, 36 in the interactive 'see' condition, and 42 in the non-interactive condition.

Stimulus materials

The same stimulus materials were used as in Study 1.

Procedure

Women between 25 and 45 years of age were randomly selected from the PanelClix subject pool and assigned to one of the experimental conditions. Subjects willing to participate clicked on the research link that was enclosed in the invitation from PanelClix, which redirected them to an online survey that consisted of four parts. In the first part, participants were asked to read and sign an informed consent form. In the second part, participants' demographics (age, gender, and education level) and Android tablet accessibility (yes/no) were measured. Only those who matched the study's research criteria were able to continue.

In the third part, participants were instructed to install *The Digital Flair App* on their tablet, to log in, and to read the tutorial. Next, participants were instructed to open the *Flair* issue that was accessible in the kiosk of the app, and to read/use it for about 10 minutes. In this issue of *Flair*², participants were exposed to either the interactive or the non-interactive version of the Chanel advertisement (depending on the experimental condition they were in).

In the final part of the survey, questions were posed to measure participants' magazine content attitude. Participants were then instructed to (re)open the *Flair* issue, and to go to the pages that contained the Chanel advertisement. In the non-interactive and interactive 'see' condition, participants were instructed to solely passively observe the advertisement (i.e., to not click on anything), whereas in the interactive 'use' condition, participants were instructed to actually click on the movie clip feature and to play it for at least 30 seconds. Next, brand attitude, ad attitude, perceived surprise, and perceived interactivity were measured. Upon completion, participants received credit points from PanelClix.

Measures

Processing variables

Perceived interactivity ($\alpha = .82$, $M = 4.16$, $SD = 1.24$) and perceived surprise were measured in the same way as in Study 1 ($M = 4.12$, $SD = 1.69$).

Attitudinal responses

Ad attitude ($\alpha = .96$, $M = 4.03$, $SD = 1.40$) and brand attitude ($\alpha = .95$, $M = 4.32$, $SD = 1.26$) were assessed with the same scales as in Study 1.

Control variables and randomization checks

The control variables (magazine content attitude: $\alpha = .95$, $M = 4.90$, $SD = 1.09$) and randomization checks (age, gender, and education) were tested in an identical manner as in Study 1.

Results

Randomization

The experimental groups did not differ with respect to participant age, $F(2, 118) = 2.16$, $p = .120$, level of education, $F(2, 118) = 0.28$, $p = .756$; or magazine content attitude, $F(2, 118) = 0.11$, $p = .897$. These data confirm that differences across the experimental groups were not the result of variations in these background variables.

² Same as used in Study 1.

Direct effects of interactive magazine ads on perceived surprise and perceived interactivity

To test the effects of interactive magazine ads on perceived interactivity and perceived surprise, a MANOVA was conducted with a Bonferroni *post-hoc* analysis (see Table 1). The results revealed significant differences on perceived interactivity, $F(2, 118) = 30.35, p < .001$, as well as on perceived surprise, $F(2, 118) = 78.85, p < .001$. With regards to perceived interactivity, participants in the two interactive conditions evaluated the advertisement as significantly more interactive ($M_{\text{see}} = 4.22; M_{\text{use}} = 4.72$) than the ones who were in the non-interactive condition ($M = 3.53; p_{\text{vs. see}} = .027; p_{\text{vs. use}} < .001$). There was no significant difference between the two interactive conditions ($p = .169$).

In contrast, with regards to perceived surprise, a significant difference was found between the two interactive conditions: Participants who had actually used the interactive feature evaluated the advertisement as more surprising ($M = 5.14$) than the ones who had only seen it ($M = 3.92; p = .001$), or had been exposed to the non-interactive version of the advertisement ($M = 3.24, p < .001$). There was no significant difference between the latter two conditions ($p = .144$).

Mediation effects through perceived interactivity and perceived surprise

To test whether perceived interactivity and perceived surprise underlie the effects of interactive magazine ads on consumers' attitudinal responses, we converted our independent variable into three dummy variables (for each condition one). Next, we re-tested the parallel mediation models presented in Study 1 (see Figure 1), by running for each model three separate parallel mediations (for each dummy-variable comparison one). The results of PROCESS are described below and summarized in Tables 2 and 3.

Model 1: The mediated effects on ad attitude

For all dummy-variable comparisons, PROCESS demonstrated positive mediation effects on ad attitude through perceived interactivity (see Table 2). Comparisons 1 and 2 showed, in-line with the MANOVA outcomes, that participants in the two interactive conditions ('see' and 'use') evaluated the advertisement as more interactive than the ones who were in the non-interactive condition, which subsequently translated into a more positive ad attitude. In addition, Comparison 3 revealed that this mediation effect through perceived interactivity was substantially stronger in the condition in which participants had actually used the interactive feature compared to the one in which participants had only seen it.

With regards to perceived surprise, we found an exact identical pattern for the three dummy-variable comparisons. In sum, this meant that both perceived interactivity and perceived surprise mediated the effects of interactive magazine ads on ad attitude, and that mediation effects were substantially stronger when participants had actually used the interactive feature (vs. only seen).

Model 2: The mediated effects on brand attitude

In-line with the findings of model 1, PROCESS revealed for all three dummy-variable comparisons positive mediation effects through both perceived interactivity and perceived surprise on brand attitude (see Table 3). In sum, this meant that both processes mediated the effects of ad interactivity on brand attitude, and that mediation effects were substantially stronger when participants had actually used the interactive feature (vs. only seen).

Table 2. Tested parallel mediations: Indirect effects on ad attitude (Model 1)

Interactive magazine ads <i>Reference</i>	Mediator (M)	Indirect effect	Direct effects	
		<i>b</i> (SE) [95% BCBCI]	Interactive magazine advertising on M <i>b</i> (SE)	M on brand attitude <i>b</i> (SE)
C1. Interactive (see) <i>Non-interactive</i>	Perceived interactivity	.14(.09) [.010; .370]	.69(.26)**	.20(.08)*
	Perceived surprise	.37(.19) [.026; .768]	.68(.34)*	.54(.06)***
C2. Interactive (use) <i>Non-interactive</i>	Perceived interactivity	.24(.13) [.051; .594] ^a	1.19(.25)***	.20(.08)*
	Perceived surprise	1.03(.21) [.671; 1.470] ^a	1.90(.32)***	.54(.06)***
C3. Interactive (use) <i>Interactive (see)</i>	Perceived interactivity	.10(.07) [.007; .308] ^b	.50(.26)†	.20(.08)*
	Perceived surprise	.66(.21) [.323; 1.156] ^b	1.22(.34)***	.54(.06)***

Note. C = (dummy-variable) comparison, M = mediator, ^a ^b = significant difference in effect strength (tested with the contrast module in PROCESS). † = $p < .10$, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 3. Tested parallel mediations: Indirect effects on brand attitude (Model 2)

Interactive magazine ads <i>Reference</i>	Mediator (M)	Indirect effect	Direct effects	
		<i>b</i> (SE) [95% BCBCI]	Interactive magazine advertising on M <i>b</i> (SE)	M on brand attitude <i>b</i> (SE)
C1. Interactive (see) <i>Non-interactive</i>	Perceived interactivity	.13(.10) [.010; .448]	.69(.26)**	.19(.09)*
	Perceived surprise	.23(.13) [.022; .508]	.68(.34)*	.34(.07)***
C2. Interactive (use) <i>Non-interactive</i>	Perceived interactivity	.22(.13) [.017; .529]	1.19(.25)***	.19(.09)*
	Perceived surprise	.64(.19) [.335; 1.094]	1.90(.32)***	.34(.07)***
C3. Interactive (use) <i>Interactive (see)</i>	Perceived interactivity	.09(.07) [.000; .315] ^a	.50(.26)†	.19(.09)*
	Perceived surprise	.41(.15) [.179; .778] ^a	1.22(.34)***	.34(.07)***

Note. C = (dummy-variable) comparison, M = mediator, ^a = significant difference in effect strength (tested with the contrast module in PROCESS). † = $p < .10$, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Perceived interactivity vs. perceived surprise

For each dummy-variable comparison in Tables 2 and 3, the strength of the indirect effects of perceived interactivity and perceived surprise was compared using the contrast module in PROCESS. The results revealed that when participants had actually used the interactive feature, the indirect effects through perceived surprise were often stronger than the indirect effects through perceived interactivity. We can therefore say that perceived surprise was a slightly better explanatory mechanism than perceived interactivity.

GENERAL CONCLUSION AND DISCUSSION

The current study investigated with two real-life setting experiments, whether and how consumers use the interactive features placed in digital magazines advertisements, and what the persuasive influence is of these interactive magazine ads on consumers' attitudinal responses. To address the first aim, we conducted a field experiment (Study 1) to examine how consumers respond to the presence of an interactive feature in a digital magazine advertisement. Results revealed that consumers generally like the presence of the interactive feature in digital magazine advertisements. However, consumers rarely seize the opportunity to actually use it. Therefore, the presence of an interactive feature had no substantial impact on consumers' ad exposure time.

To address the second aim, we developed a theoretical framework to explain the persuasive effects of interactive magazine ads on consumers' attitudinal responses (i.e., ad attitude and brand attitude). More specifically, two mediation pathways were proposed: one through perceived interactivity and one through perceived surprise. Both pathways were tested for their explanatory power in Studies 1 and 2. Study 2 replicated and extended Study 1 by also examining the impact of 'use of the interactive feature' on the strength of the ad interactivity effects.

Our findings showed that consumers evaluated the advertisement with the interactive feature as more interactive (Studies 1 and 2), regardless of whether they had used the interactive feature (Study 2). In addition, they evaluated the advertisement as more surprising (Studies 1 and 2), especially when the feature was actually used and not only seen (Study 2). Furthermore, Study 1 demonstrated that both perceived interactivity and perceived surprise mediated the relationship between interactive magazine ads and consumers' ad attitude. This finding proved to be robust, as Study 2 confirmed and extended the results of Study 1, by revealing that the mediation effects were even substantially stronger when consumers had used the interactive feature (vs. only seen). Moreover, the results of Study 2 revealed that perceived surprise was a slightly better explanatory mechanism than perceived interactivity.

The results of Study 1 further showed that perceived surprise also mediated the effect of interactive magazine ads on brand attitude. However, no indirect effect was found through

perceived interactivity. Study 2 confirmed the proposed indirect effect via perceived surprise, but also showed support for an indirect effect through perceived interactivity. Furthermore, Study 2 demonstrated that these indirect effects of the relationship between interactive magazine ads and brand attitude were substantially stronger when consumers had actually used the interactive feature (vs. only seen).

In sum, we can conclude that both perceived interactivity and perceived surprise can explain the positive effects of interactive magazine ads on consumers' attitudinal responses. Furthermore, these mechanisms predict the effects on consumers' attitudinal responses even better when the interactive feature is actually used (vs. only seen), with perceived surprise as a slightly better explanatory mechanism than perceived interactivity.

Theoretical and methodological implications

This study makes several important contributions to the existing literature regarding online advertising and interactivity effects. First, it demonstrates that the positive effects of ad interactivity identified in previous online advertising studies – in which website banners, mobile (phone) ads, and digital TV ads were investigated (e.g., Brown, 2002; Campbell & Wright, 2008; Cauberghe & De Pelsmacker, 2010; Gao et al., 2009; Sundar & Kim, 2005) – also apply to the context of digital magazines. This is an important finding as it shows that digital magazines demonstrate interactivity processes and effects that are similar to those of other online media, despite their differences (e.g., digital magazines are characterized as a lean-back medium, and are mostly read page by page, in a linear fashion). Furthermore, the modality of the medium in our study (a digital magazine with mainly static text and pictures) differed from the modality activated by our interactive feature (a video clip). This discrepancy in modality was not present in previous interactive advertising studies, and might have contributed to the strong explanatory value of perceived surprise. Contributing to the current literature on ad interactivity, our findings suggest that interactivity effects may occur in a variety of media contexts and for different types of interactive ads.

Second, this study identifies the underlying processes (i.e., perceived interactivity and perceived surprise) responsible for the effects of interactive magazine ads on consumers' attitudinal responses. Although previous online advertising studies have demonstrated direct relationships between ad interactivity and perceived interactivity and perceived surprise (Brown, 2002; Gao et al., 2009; Sundar & Kim, 2005), these studies did not test whether these processes could also underlie the effects on ad and brand attitudes. This study therefore contributes to the online advertising literature by proposing and testing a theoretical framework to explain how (magazine) ad interactivity affects consumers' attitudinal responses.

Third, the finding that both perceived interactivity and perceived surprise underlie the effects of magazine ad interactivity on consumers' attitudinal responses significantly

contributes to the general (non-advertising) interactivity literature. Previous studies have qualified perceived interactivity as the main driver of ad interactivity effects (e.g., Wu, 2005). However, researchers have recently argued that these effects could also be explained by a novelty effect (Voorveld et al., 2011). The latter notion implies that the effects of ad interactivity would dissipate once consumers are no longer surprised by the presence of novel interactive features. This study empirically examined this notion by testing the explanatory power of both perceived interactivity and perceived surprise using parallel mediation analyses. The results revealed that both processes play a substantial role in explaining the effects of interactive magazine ads on consumers' attitudinal responses, demonstrating that perceived interactivity is not the sole driver of these effects. This finding supports the idea that ad interactivity effects will not completely wear out once consumers acclimate to the interactive features.

Fourth, the findings of this study also make a valuable contribution to the Dual-Process Model of Interactivity Effects (Liu & Shrum, 2009). According to this model, interactive features in digital content can positively influence consumers' attitudinal responses in two ways: as a peripheral cue (i.e., consumers only see the interactive feature, but do not use it), or by actually using the interactive feature. Our study provides empirical support for this model in the context of digital magazine advertising, as we demonstrate that ad interactivity positively influences consumers' ad and brand attitudes through perceived interactivity and perceived surprise regardless of whether consumers had used the interactive feature or had experienced it as peripheral cue. Moreover, the outcomes of this study extend the model by showing that the strongest effects can be reached when interactive features have actually been used.

Besides the above-mentioned theoretical contributions, this study also makes a notable methodological contribution to the literature. The successful execution of the study's methodological design demonstrates that it is possible to examine interactivity effects in a real-life setting rather than using lab or online experiments, techniques that have been predominately used in previous studies. More specifically, high external and ecological validity was reached in this study by conducting a field experiment that included: (1) authentic (current) issues of an existing magazine title, (2) non-forced ad exposure³, (3) a non-student sample, (4) a digital magazine app that enabled participants to read the magazine at home on their own tablet, and (5) the integration of in-app analytic software that facilitated unobtrusive and precise registration of participants' reading behaviour. An important benefit of using a real-life setting is the enhanced generalizability of the research findings, thus providing a more realistic view of 'how it works in the real world'.

³ Only in Study 1

Limitations and future research

Although the findings of this study make several valuable contributions to the existing literature, they need to be evaluated in the context of this particular research. More specifically, this study investigated the persuasive impact of interactivity in digital magazine advertisements by manipulating the presence of an interactive movie clip feature. However, other elements may contribute to explaining the persuasive impact of ad interactivity. The following areas of research should be considered to obtain a more comprehensive understanding of the persuasive impact of interactive magazine ads.

First, further research is necessary to examine whether different types of interactive features have different persuasive effects. This study used an interactive movie clip feature to manipulate magazine ad interactivity, however, a plethora of other features could be used to create interactivity in a digital magazine advertisement. Some researchers argue that the interactive features can be divided into three categories: features that facilitate two-way communication (e.g., social media buttons), active control (e.g., hyperlinks), or synchronicity (e.g., animations that displays the loading time; Liu & Shrum, 2002; Voorveld et al., 2011). As our manipulation of interactivity can be categorized as a form of active control (i.e., it gives the user control over the information flow), we are unable to conclude whether the study findings also apply to digital magazine advertisements that contain interactive features based on other forms of interactivity. Furthermore, interactive features can be classified based on their level of modality interactivity: the degree to which an interactive feature activates different modalities to present its information vividly (Sundar, 2007). Research has shown that modality interactivity can improve consumer responses, as it makes the information stand out (Yang & Shen, 2018). Additional research is needed to compare different types of interactive features in their ability to elicit persuasive effects.

Second, a limitation of Study 2 is that forced exposure had to be used to be able to test how actually 'using' the interactive feature affected consumers' attitudinal responses. As a consequence, and in contrast to Study 1, participants were unable to experience the advertisement and the interactive feature in a fully 'natural' way. Although results of Studies 1 and 2 show great similarities, indicating that the forced exposure method had no (large) impact on the interactivity effects, more research is needed to further examine consumers' natural responses towards magazine ad interactivity. It is, for instance, likely that when consumers are intrinsically motivated to click on an interactive feature placed in a digital magazine ad (vs. being instructed to), they will be more receptive towards the commercial content offered by the feature (e.g., because they are truly motivated to get the information), which could subsequently result into stronger persuasive outcomes.

Another area of research that needs more examination is the potential influence of the advertised content, as the persuasive effects of ad interactivity could be affected by content frame (e.g., more vs. less informative, more vs. less emotional), type of product/service

(e.g., utilitarian vs. hedonic), or type of brand (e.g., familiar vs. non-familiar). Furthermore, it is possible that consumer characteristics (e.g., age, gender, or product involvement) can influence consumer responses to interactivity. For instance, if consumers are not involved with the advertised brand, product, or service, they may be less likely to use the interactive features in the advertisement (Liu & Shrum, 2009).

Finally, the digital nature of this research field requires inclusion of behavioural measures of advertising effectiveness in addition to traditional indicators used in the current study. It would be valuable to gain insight into clicking behaviours, for example, to see how interactive ad clicks influence other 'click through' behaviours such as purchases. Such information would provide valuable information to advertisers.

Practical implications

The current study provides several important implications for both online advertisers and digital magazine publishers. First, this study shows that consumers generally react positively to the placement of interactive features in digital magazine advertising, even though they rarely use such features. In addition, even the mere presence of these features makes consumers evaluate advertisements as more interactive and more surprising, which subsequently leads to more positive ad and brand attitudes. For advertisers, this suggests that implementing interactivity in digital magazine advertisements could lead to more positive campaign responses. These effects can be further reinforced when readers actually use these features. As consumers are often not inclined to do so spontaneously, incentivizing click behaviours on interactive ads could be an interesting venue for advertisers to strengthen the effectiveness of digital magazine advertisements.

Second, this study suggests that interactivity effects will not completely dissipate when consumers acclimate to newly integrated interactive features. The effects of digital magazine advertisements on consumers' attitudinal responses are only partially explained by perceived surprise, as perceived interactivity also partially explains the effects. However, once consumers acclimate to interactive features implemented in digital magazines, the overall persuasive impact of interactive magazine ads can diminish due to the declining surprise effects. It is therefore important for advertisers to keep developing innovative ways to surprise consumers, thereby maintaining the persuasive effects of interactive digital magazine ads on consumers' ad and brand attitudes.

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